

AGENDA (Part 2)

DHCD WORKGROUP MEETING 2012 Code Change Cycle

August 22, 2013 at 9:30

Virginia Housing Center

NOTE: These are the code changes that were sent out as a list in the June 24th memo **as well as new and updated code changes.** All remaining code changes will be discussed at the next Workgroup meeting on October 11, 2013.

The agenda is very large and has been split into two files.

START PART TWO: (PAGES 163 - 348)

VBCOA IRC Committee - Note: These code changes should be reviewed in particular by impacted stakeholders, the VBCOA IRC Committee (Chuck Bajnai), the VBCOA Energy Committee (Matt Westheimer) and the VPMIA PMG Committee (Shawn Strasburg).

DESCRIPTION	Page #
1. IRC R311.3.1 - Exterior landing.	163
2. IRC R402.2.13 - Mechanical room ventilation. VRC N1102.4.5 – Equipment room isolation. Carry-over.	164
3. IRC R403.1. - New exception. Footings not required for ramps no more than 30" above grade (R-3 AND R-5).	166
4. IRC Energy 403.2.2 and 403.2.2.2 – Sealing/Visual Inspection. Requires duct testing.	167
5. IRC R403.4.2 and 403.6. M1401.3 and M1401.3 – Energy, Equipment, Appliance sizing. Add new text and exception. Two code changes. Carry-over.	169
6. IRC R602.3.1- Tall walls. Carry-over.	173
7. IRC R806 - Roof ventilation. Carry-over.	175
8. IRC M1501.2 - Transfer air. Carry-over.	177
9. IRC 1503.4 - Makeup air. Carry-over.	178
10. IRC G2411 - CSST standard. Carry-over. Note: This will be discussed at the October 11 th meeting. No attachments now. Standard is not finalized yet.	N/A
11. IRC R507 – Decks. Complete replacement of section. Note: attachment to code change is the latest version submitted by C. Bajnai.	180
12. IRC R507.2 and 5067.2.3 – Decks. Three code changes. Carry-over.	193
13. IRC 202 - Habitable attic. Leave as is or consider 1/3 floor below. Carry-over.	196
14. IRC E3902.2 - garage GFCI for freezers and garage door openers.	197
15. IRC Tables for Southern Pine lumber.	198

DESCRIPTION	Page #
16. IRC 607.2 – Length of hot water pipe.	229
17. ISSUE (NO CODE CHANGES SUBMITTED): <ul style="list-style-type: none"> • IRC 602.10 – Wall bracing. Foyer/recreation rooms and walls over 12 feet? 	N/A

VA-IAEI - Note: This issue should be reviewed in particular by impacted stakeholders and VA-IAEI (Haywood Kines).

DESCRIPTION	Page #
1. Review emergency power for I occupancies if code changes submitted. There was a VA Dept. of Health study on this issue. Note: for now, this is informational only.	N/A

VFPA/FSBCC: These code changes should be reviewed in particular by impacted stakeholders, VFPA and the SFMO:

DESCRIPTION	Page #
1. SFPC 103.2 - Administrative inspections, permits construction document. SFPC Section 106.3 covers all inspections deemed necessary or if something is missing can be done in Chapter 1 similar to USBC did some time ago? T107.2 covers now all operational permits so if need others can add? Open flame is broaden that clearly includes sterno canisters to warm food trays, but doesn't cover other occupancies besides A such as B or M or R? 901.2 needs to be correlated with the USBC 109 for construction documents as USBC governs copies that are disturbed to fire or maintenance officials, planning, zoning, public works and transportation departments?	230
2. SFPC 107.5.1, 107.13 - Clean-up; adds exception for issuance of explosive and firework permits by the SFMO.	263
3. SFPC SFM new fee for permissible fireworks on state property. Legal issues.	265
4. SFPC 107.6 and 107.14 - SFMO several code changes for new permit fees for complaints and hourly charge after 1 st visit that had near consensus last August, 2012. The hourly fee now starts at the revisit. Another fee code change has compliance inspections for hotels and motels and bed and breakfasts so how do the two works together with complaint inspections or there is not a relationship? Is this complaint fee still an annual fee? Why are B and B fees same as hotels up to 50 sleeping units? For the retail sales of permissible fireworks, this fee was discussed last August and December, 2012 and had opposition. One of the issues for compliance annual inspections of permissible firework retailers is the supporting statement say the purpose is to fine illegal fireworks and that presents legal and industry concerns not yet addressed. The BHCD's CDC had similar questions last year. New fee for bonfires on state property. Any idea on numbers seeing a need for this permit and inspection time for bonfires? Need to vet with DGS and three colleges with building officials. Need more information on all these new fee programs such as the staffing, risks assessment on need and budgets for income and expenditures.	267
5. SFPC 107.16 - SFMO permit fees not refundable. Need some fixes. The title says not refundable but there are refunds for certification fees. Not sure it needs to be non-refundable and can say refunds are for only these fees as has been done in the 2 nd sentence?	275
6. SFPC 5601.4.3.1 - New SFMO fee for replacement of certificate. Should this one be grouped with all the SFMO fees in chapter 1?	276

DESCRIPTION	Page #
7. SFPC 108.3 - Condition of permit. This change now deletes text in section and then adds a note with the same language. The SFPC cannot direct what a building official does under the USBC, not even in a note.	277
8. SFPC - Sky lanterns 202 and 308.1.6.3.	279
9. SFPC 403.3 - Crowd managers for A occupancies that is referenced in the supporting statement and only need when more than 1, 000 persons and then each 250 persons thereafter.	280
10. SFPC 307.1 – Approved outdoor live fire training exception.	283
11. SFPC Chapter 4 rewrite. Does reduce from 12 to 6 fire drills in I-1 and allows designation of an assembly point. Since it is entire chapter, a better explanation of the changes that go beyond current requirements is needed so stakeholders can better understand the change besides clarity and format changes.	284
12. SFPC 404.2. - Evacuation plans. Bed and Breakfasts.	306
13. SFPC 503.1- Would require fire apparatus access roads for new and existing tire storage yards. Supporting statement indicates this is being done now.	308
14. SFPC 607.1 and other sections – Changes to existing building references.	309
15. SFPC 609.3.3.3 - Tags kitchen hood systems. From 2015 IFC code change. Seems reasonable much like tagging of fire extinguishers.	311
16. SFPC IFC 703.3.3/703.1.1- Delete annual visual inspection all existing buildings for rated and fire-resistance construction. Issues and questions are do owners file and do reports, how to identify what to inspect, are reports retained, covers all existing buildings, how related to the USBC VMC, how will SFMO implement and what are enforcement problems? This needs study, cost impact and risk assessment. Will need for someone to educate owners? Should any occupancy be exempted like dwelling units? In SFPC or USBC VMC, it is those code officials who already are allowed to do periodic inspections. Was part of a STRB case.	313
17. SFPC 906.3/906.4 - SFMO new certification program fire extinguisher technician. Need program details, numbers impacted, budget and staff information. DHCD will work with the SFMO to determine if this code change and program requires statutory authorization.	314
18. USBC 307.1. USBC/SFPC 5001.3 NFPA 45 SFM to reference in SFPC only for laboratories operating with no control areas. Issues include: <ul style="list-style-type: none"> • What code it was built under (so how does it violate the SFPC)? • Can this work in the SFPC only without conflicting with the USBC VCC or VRC and outside the SFPC’s scope? • What is the impact on a certificate of occupancy issued? • If there isn’t a CO, does this issue violate the CO for occupancy quantity limits so the lab is an H-3? • Is this code change considered a retrofit measure? • Should the code change be in the SFPC and the USBC VCC and VRC/IEBC? Should there be an appeal to the STRB? NOTE: THIS IS LISTED IN USBC SECTION AS WELL.	318
19. SFPC/USBC 5003.1.1 - Delete footnote “d” so can now store only 125 not 250 solid pounds in sprinkled retail building. Needs to be in USBC for enforcement purposes as is construction matter too for designation of occupancy, type of construction, height and area, fire protection systems, egress, etc. Permissible fireworks need to be review too as this change has great impact on retailers. Will need to add into the USBC and replicated in the SFPC a new line on the tables for permissible fireworks.	323

DESCRIPTION	Page #
20. SFPC 5601.5 - New section to deny or suspend certificate for blasters and pyrotechnicians. What is the history and has cases arisen for suspension consideration? Sets up review panel that poses legal issue with appeals to the STRB.	325
21. SFPC 5603.4 - Adds the SFMO to send accident information.	327
22. SFPC 5706.6.2.1 and 6111.2.2 - Code Change for fuel and propane trucks parking residential areas define plus distance being reasonable. Was submitted as a placeholder. Propane change is already a technical amendment different than the IFC 6111.2.1 referencing NFPA standard.	328
23. SFPC Section 5607.16 – Blast records	330
24. ISSUE (NO CODE CHANGES SUBMITTED): <ul style="list-style-type: none"> • SFPC Chapter 2 definition “responsible management” for blaster’s code change approved with direction by the BHCD’s CDC to revise. Also, need to revise to enable Code Commission approval. A revised code change did not address either of these two matters. This will be discussed at the October 11th meeting. No attachments now. • SFPC delete construction requirements discuss how, why and when. Email attached. 	335

Related Laws:

DHCD and state agencies and VBCOA, VPMIA and key stakeholders to review.

DESCRIPTION	Page #
1. DEQ UST and charts reviewing now with sub-group.	339
2. COV 32.1-165 – Add as a related law - Go over how septic systems are coordinated with local health inspectors and building departments.	340
3. DOLI boilers.	341
4. DPOR charts.	344

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: CHRIS SHADOW Representing: MYSELF

Mailing Address: P.O. BOX 90775, HENRICO, VA. 23273-0775

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Proposal Information

Code(s) and Section(s): (IRC) SECTION R311.3.1

Proposed Change (Including all relevant section numbers, if multiple sections):

R311.3.1 Floor elevations at the required egress doors,
landings of floors ...

Exception: The exterior landing or floor shall not be
more than 8 1/4 inches (210mm) below the
top of the threshold ...

Supporting Statement (Including intent, need, and cost impact of the proposal):

PROVIDES CONSISTENCY WITH VIRGINIA AMENDMENT
TO RISER DIMENSION IN SECTION R311.7.4.1.

Submittal Information

Date Submitted: MARCH 1, 2013

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 SBCO (State Building Codes Office)
600 East Main Street
Suite 300
Richmond, VA 23219

Email Address: Vernon.hodge@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7150



VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual(s) Government Entity Company

Name: Bryan Deem and Stephen Turchen

Representing: VBCOA

Mailing Address: 359 Laurel Drive, Aylett, Virginia 23009

Email Address: bdeem@co.stafford.va.us

Telephone Number: 540-658-4504

Proposal Information

Code(s) and Section(s): VCC, IECC R402

Proposed Change (including all relevant section numbers, if multiple sections):

Add a new subsection to Section R402 to read as follows:

R402.2.13 Mechanical rooms. If a room contains combustion equipment, and outside air is admitted directly into the room to provide combustion air for the equipment, then the walls, doors, ceilings, and floors of that room bound unconditioned space and must be insulated as part of the *building thermal envelope*.

Supporting Statement (including intent, need, and impact of the proposal):

Reason:

AHJs have disagreed regarding how to apply the energy code to "mechanical rooms" with permanently installed air ducts directly connecting the room to the outdoor environment. This proposal attempts to apply the code requirements to these rooms in a feasible and enforceable manner. Note that by identifying the enclosure of the mechanical room as part of the thermal envelope, these surfaces will be sealed as well as insulated, thereby preventing unwanted and energy-consuming air intrusion into the conditioned living space adjacent to the mechanical room. This provision has been submitted to ICC for review to be incorporated into the 2015 IRC, IECC.

Cost Impact:

To the extent that mechanical rooms have previously been considered unconditioned space and were enforced as such, this clarifying proposal has no cost impact. If these rooms were previously uninsulated, there will be some costs associated with insulating the customary framed walls and ceiling of the room, as well as sealing potential avenues of air infiltration to the conditioned living space beyond.

Submittal Information

Date Submitted: 6/13/12

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

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Guy Tomberlin

Representing: VPMIA

Mailing Address: _____

Email Address: _____ Telephone Number: _____

Proposal Information

Code(s) and Section(s): VRC Section N1102.4.5

Proposed Change (including all relevant section numbers, if multiple sections):

Add new Section N1102.4.5 as follows:

N1102.4.5 Equipment room isolation. Where outdoor combustion air is supplied into a room or space, the interior walls, floor and ceiling adjacent to living space shall be insulated to the same requirements as the building's thermal envelope.

Supporting Statement (including intent, need, and impact of the proposal):
This requires that when you have outdoor introduced into a room or space serving as combustion air for fuel fired appliances that the space be considered the same as outside. This will prevent an extremely cold unwanted air from transferring into other parts of the building. This proposed section will specifically not apply to direct vent type Category IV appliances that utilize directly connected piping for combustion air.

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

Supporting Statement (including intent, need, and cost impact of the proposal):

DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Gregory Revels

Representing: Henrico County

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Proposal Information

Code(s) and Section(s): 403.1

Proposed Change (including all relevant section numbers, if multiple sections):

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.

Add a new exception to read:

Exception: Footings are not required for ramps serving dwelling units in Group R-3 and R-5 occupancies where the height of the entrance is no more than 30 inches above grade.

Supporting Statement: These ramps are frequently erected, without permits or inspections, by volunteers to provide temporary access for the elderly and disabled, and pose minimal risk to the public. The ramps are small, light structures that are rarely attached to the dwelling and are usually disassembled and removed when no longer needed. Providing footings for these structures is burdensome and provides minimal benefit, especially when compared with other structures that are already exempt from this requirement.

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 SBCO (State Building Codes Office)
600 East Main Street
Suite 300
Richmond, VA 23219

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VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Jessica Abralind

Representing: Arlington County Government

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Email Address: jabralind@arlingtonva.us

Telephone Number: 703-228-0628

Proposal Information

Code(s) and Section(s): Chapter 4, 2009 VA Energy Code

Proposed Change (including all relevant section numbers, if multiple sections):

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 and 403.2.2.2.

403.2.2.1 Testing option. Duct tightness shall be verified by either of the following:

1. Postconstruction test: Leakage to outdoors shall be less than or equal to 8 cfm (226.5 L/min) per 100 ft² (9.29 m²) of conditioned floor area or a total leakage less than or equal to 12 cfm (12 L/min) per 100 ft² (9.29 m²) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. 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 (169.9 L/min) per 100 ft² (9.29 m²) of conditioned floor area when tested at a pressure differential of 0.1 inches 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 (113.3 L/min) per 100 ft² (9.29 m²) 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.~~

403.2.2.2 Visual inspection option. In addition to 403.2.2.1 Testing, and 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 visually inspected to verify compliance with 403.2.2 ~~considered acceptable when the requirements of Section 403.2.2 are field verified.~~

Supporting Statement (including intent, need, and cost impact of the proposal):

Visual inspections should be included because they may help builders meet the air sealing requirements of section 403.2.2 Sealing, however visual inspections alone cannot not verify compliance. Many times it will be difficult for inspectors or builders to see the quality of air sealing that was completed or it may be completely obscured by drywall or other components. In my experience, unless there is also a requirement for duct leakage testing, the visual inspections and corrections are not performed with the rigor needed to meet the air sealing requirements of 403.2.2 Sealing.

Submittal Information

Date Submitted: 3/11/13

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 SBCO (State Building Codes Office)
600 East Main Street
Suite 300
Richmond, VA 23219

Email Address: Vernon.hodge@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7150



VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Guy Tomberlin

Representing: Fairfax County and VPMA/VBCOA Code Committees

Mailing Address: 12055 Government Center Parkway Fairfax, Virginia 22030

Email Address: guy.tomberlin@fairfaxcounty.gov

Telephone Number: 703-324-1611

Proposal Information

Code(s) and Section(s): VRC Section M1401.3

Proposed Change (including all relevant section numbers, if multiple sections):

Add new exception. VIRC Section M1401.3 add new text and Exception with text as follows:

VRC M1401.3

Revise as follows:

M1401.3 Equipment/appliance Sizing. Heating and cooling equipment and appliances 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.

Exception: Heating and cooling equipment and appliances shall not be limited to the capacities determined in accordance with Manual S where any of the following conditions apply:

- 1- The specified equipment or appliance utilizes multi-stage technology or variable refrigerant flow technology and the loads calculated in accordance with Manual J fall within the range of the manufacturer's published capacities for that equipment or appliance.
- 2- The specified equipment or appliance manufacturer's published capacities cannot satisfy both the total and sensible heat gains calculated in accordance with Manual J and the manufacturer's next larger standard size unit is specified.
- 3- The specified equipment or appliance is the lowest capacity unit available from the specified manufacturer.

Supporting Statement (including intent, need, and impact of the proposal):

Item 1 - Current technology is widely available that incorporates multi-stage or VRF systems for increased efficiency. Some of these appliances have such a wide span of functionality that they extend beyond the allowable requirements outlined in Manual S. However, this technology allows the appliance to operate between minimum and maximum capacities, based on loads imposed, thus eliminating the problems associated with single-stage, oversized appliances. Additionally, the appliance will operate efficiently during times where outdoor air temperatures exceed those used to calculate the loads in Manual J.

Item 2 - Often times, the appliance manufacturer's published total and sensible capacities are at odds with the requirements of Manual S. There are many cases where the total capacity of the appliance will fall within the parameters of Manual S in relation to the calculated total gain, however the sensible capacity of the appliance may fall short of the calculated sensible gain, thus unable to provide efficient sensible cooling for the space. When the manufacturer's next standard size larger is chosen to meet the sensible gain, the total capacity of the appliance may then exceed the requirements of Manual S. Choosing the larger appliance will enable a more efficient and effective system.

Item 3 - The current code language does not have provisions for sizing appliances for minimal dwelling unit or dwelling addition loads, other than forcing owners and contractors to change appliances to less desirable systems. For example; a 2 story townhouse, in climate zone 4, with 600 square feet per floor wants to utilize a two-zone system, or a separate heat pump system for each floor. A 1.5 ton unit per floor would exceed the requirements of Manual S, however a 1.5 ton unit is the smallest available appliance by the desired manufacturer. Current language would require a complete design change, such as utilizing a single appliance to serve the entire dwelling rather than the more desirable two-zone system, or requiring a system that utilizes electric baseboard heating and window-mounted air conditioning units. This is absurd, and an injustice to an owner that desires to reduce energy costs.

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
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Richmond, VA 23219-1321

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VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Guy Tomberlin

Representing: Fairfax County and VPMIA/VBCOA Code Committees

Mailing Address: 12055 Government Center Parkway Fairfax, Virginia 22030

Email Address: guy.tomberlin@fairfaxcounty.gov

Telephone Number: 703-324-1611

Proposal Information

Code(s) and Section(s): VRC Section M1401.3 (Original proposal to be used as revised by this proposal)

Proposed Change (including all relevant section numbers, if multiple sections):

Add new exception. VRC Section M1401.3 to remain unchanged but add new Exception with text as follows:

M1401.3 Equipment/appliance Sizing. Heating and cooling equipment and appliances shall be sized in accordance with ACCA Manual S or other approved sizing methodologies based on building loads calculated in accordance with ACCA Manual J or other approved heating and cooling calculation methodologies.

Exception: Heating and cooling equipment and appliances sizing shall not be limited to the capacities determined in accordance with Manual S or other approved sizing methodologies where any of the following conditions apply:

1. The specified equipment or appliance utilizes multi-stage technology or variable refrigerant flow technology and the loads calculated in accordance with Manual J the approved heating and cooling methodology fall within the range of the manufacturer's published capacities for that equipment or appliance.
2. The specified equipment or appliance manufacturer's published capacities cannot satisfy both the total and sensible heat gains calculated in accordance with Manual J the approved heating and cooling methodology and the manufacturer's next larger standard size unit is specified.
3. ~~The specified equipment or appliance is the lowest capacity unit available from the specified manufacturer.~~

Supporting Statement (including intent, need, and impact of the proposal):

After listening to the discussions presented during the ICC Committee Action Hearings, we have incorporated those concerns within this modification. The first being the addition of "other approved sizing methodologies". ACCA's Manual S is not the **only** approved, appropriate sizing methodology available to size residential HVAC equipment. The current language would not permit other sizing methodologies such as ASHRAE's Handbook series. The second modification was to reword the language to provide clarity to the text. The third modification was to remove the third exception based on concerns voiced during testimony about the broad aspects that such an exception would permit.

The following is from the original reason statement:

Item 1 - Current technology is widely available that incorporates multi-stage or VRF systems for increased efficiency. Some of these appliances have such a wide span of functionality that they extend beyond the allowable requirements outlined in Manual S. However, this technology allows the appliance to operate between minimum and maximum capacities, based on loads imposed, thus eliminating the problems associated with single-stage, oversized appliances. Additionally, the appliance will operate efficiently during times where outdoor air temperatures exceed those used to calculate the loads in Manual J.

Item 2 - Often times, the appliance manufacturer's published total and sensible capacities are at odds with the requirements of Manual S. There are many cases where the total capacity of the appliance will fall within the parameters of Manual S in relation to the calculated total gain, however the sensible capacity of the appliance may fall

short of the calculated sensible gain, thus unable to provide efficient sensible cooling for the space. When the manufacturer's next standard size larger is chosen to meet the sensible gain, the total capacity of the appliance may then exceed the requirements of Manual S. Choosing the larger appliance will enable a more efficient and effective system.

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

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Guy Tomberlin

Representing: Fairfax County and VPMIA/VBCOA Code Committees

Mailing Address: 12055 Government Center Parkway Fairfax, Virginia 22030

Email Address: guy.tomberlin@fairfaxcounty.gov

Telephone Number: 703-324-1611

Proposal Information

Code(s) and Section(s): VECC Section R403.6 (Original proposal to be used as revised by this proposal)

Proposed Change (including all relevant section numbers, if multiple sections):

Add new exception. VECC Section R403.6 to remain unchanged but add new Exception with text as follows:

R403.6 Equipment/appliance Sizing. Heating and cooling equipment and appliances shall be sized in accordance with ACCA Manual S or other approved sizing methodologies based on building loads calculated in accordance with ACCA Manual J or other approved heating and cooling calculation methodologies.

Exception: Heating and cooling equipment and appliances sizing shall not be limited to the capacities determined in accordance with Manual S or other approved sizing methodologies where any of the following conditions apply:

1. The specified equipment or appliance utilizes multi-stage technology or variable refrigerant flow technology and the loads calculated in accordance with Manual J the approved heating and cooling methodology fall within the range of the manufacturer's published capacities for that equipment or appliance.
2. The specified equipment or appliance manufacturer's published capacities cannot satisfy both the total and sensible heat gains calculated in accordance with Manual J the approved heating and cooling methodology and the manufacturer's next larger standard size unit is specified.
3. The specified equipment or appliance is the lowest capacity unit available from the specified manufacturer.

Supporting Statement (including intent, need, and impact of the proposal):

After listening to the discussions presented during the ICC Committee Action Hearings, we have incorporated those concerns within this modification. The first being the addition of "other approved sizing methodologies". ACCA's Manual S is not the **only** approved, appropriate sizing methodology available to size residential HVAC equipment. The current language would not permit other sizing methodologies such as ASHRAE's Handbook series. The second modification was to reword the language to provide clarity to the text. The third modification was to remove the third exception based on concerns voiced during testimony about the broad aspects that such an exception would permit.

The following is from the original reason statement:

Item 1 - Current technology is widely available that incorporates multi-stage or VRF systems for increased efficiency. Some of these appliances have such a wide span of functionality that they extend beyond the allowable requirements outlined in Manual S. However, this technology allows the appliance to operate between minimum and maximum capacities, based on loads imposed, thus eliminating the problems associated with single-stage, oversized appliances. Additionally, the appliance will operate efficiently during times where outdoor air temperatures exceed those used to calculate the loads in Manual J.

Item 2 - Often times, the appliance manufacturer's published total and sensible capacities are at odds with the requirements of Manual S. There are many cases where the total capacity of the appliance will fall within the parameters of Manual S in relation to the calculated total gain, however the sensible capacity of the appliance may fall

short of the calculated sensible gain, thus unable to provide efficient sensible cooling for the space. When the manufacturer's next standard size larger is chosen to meet the sensible gain, the total capacity of the appliance may then exceed the requirements of Manual S. Choosing the larger appliance will enable a more efficient and effective system.

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

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Chuck Bajnai

Representing: VBCOA IRC Committee

Mailing Address: 9800 Government Center Parkway, Chesterfield, VA, 23832

Email Address: bajnaic@chesterfield.gov

Telephone Number: 804-717-6428

Proposal Information

Code(s) and Section(s): R602.3.1

Proposed Change (including all relevant section numbers, if multiple sections):

1. Delete Table R602.3.1 (and the accompanying drawing):

~~TABLE R602.3.1~~

~~MAXIMUM ALLOWABLE LENGTH OF WOOD STUDS EXPOSE TO WIND SPEEDS OF 100 MPH OR LESS IN SEISMIC DESIGN CATEGORIES A, B, C, D₀, D₁, and D₂^{b,c}~~

2. Modify Section R602.3.1 as follows:

R602.3.1. Stud size, height and spacing. The size, height and spacing of studs shall be in accordance with Table R602.3(5).

Exceptions:

1. no change

~~2. Studs more than 10 feet in height which are in accordance with Table R602.3.1.~~

2. Where snow loads do not exceed 25 pounds per square foot, walls exposed to wind loads of 100 mph or less shall be permitted over 12 feet tall for either supporting a roof load with not more than 6' of tributary length, or for a gable end wall. The studs shall be a minimum 2x6 at 16 inches on center with a maximum height of 18 feet or 2x6 at 12 inches on center with a maximum height of 20 feet. Openings shall be permitted with jack studs supporting the header in accordance with Section R602.7 and double king studs outboard of the jacks on each side of the opening. If any portion of the two-story wall is required to be a qualified braced wall panel to achieve compliance with Section R602.10.2 for either floor, then the wall shall be designed by a registered design professional in accordance with the International Building Code.

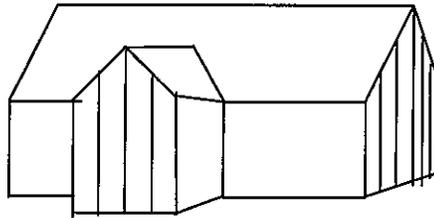
Supporting Statement (including intent, need, and impact of the proposal):

This proposal is submitted to ICC for the 2015 IRC by the Building Code Action Committee (BCAC) and moved forward for the 2012 VRC for the benefit of all users.

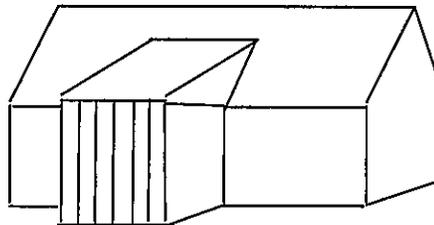
Table R602.3.1 has been the source of a lot of confusion. The footnote b is seldom read or understood. This change is submitted to:

1. Eliminate the table - the source of the confusion
2. Provide clarification as to where it can be applied (see the three options below)
3. Write in code language the requirements for when tall studs can be used.
4. To say that you cannot use these tall studs where the wall is an integral part of the wall bracing system.

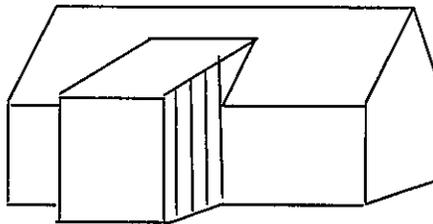
Tall studs could be used for two-story gable ended wall supporting nothing more than self weight.



Tall studs could be used for a two-story projection where the roof framing runs perpendicular to the wall so long as the overbuilt roof has a trib length of 6' or less



Tall studs could be used for a two-story projection where the roof framing runs parallel to the wall such that it was supporting nothing more than self weight



Submittal Information

Date Submitted: _____

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Chuck Bajnai

Representing: VBCOA IRC Committee

Mailing Address: 9800 Government Center Parkway, Chesterfield, VA, 23832

Email Address: bajnaic@chesterfield.gov

Telephone Number: 804-717-6428

Proposal Information

Code(s) and Section(s): R806.1

Proposed Change (including all relevant section numbers, if multiple sections):

Revise Section R806.1 as follows:

**SECTION R806
ROOF VENTILATION**

~~R806.1 Ventilation required.~~ Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain or snow. Ventilation openings shall have a least dimension of 1/16 inch (1.6 mm) minimum and 1/4 inch (6.4 mm) maximum. Ventilation openings having a least dimension larger than 1/4 inch (6.4 mm) shall be provided with corrosion-resistant wire cloth screening, hardware cloth, or similar material with openings having a least dimension of 1/16 inch (1.6 mm) minimum and 1/4 inch (6.4 mm) maximum. Openings in roof framing members shall conform to the requirements of Section R802.7. Required ventilation openings shall open directly to the outside air.

~~Exception:~~ Attic ventilation shall not be required when determined not necessary by the code official due to atmospheric or climatic conditions.

~~R806.2 Minimum vent area.~~ The minimum net free ventilating area shall be 1/150 of the area of the vented space.

~~Exception:~~ The minimum net free ventilation area shall be 1/300 of the vented space provided one or more of the following conditions are met:

- ~~1. In Climate Zones 6, 7 and 8, a Class I or II vapor retarder is installed on the warm-in-winter side of the ceiling.~~
- ~~2. At least 40 percent and not more than 50 percent of the required ventilating area is provided by ventilators located in the upper portion of the attic or rafter space. Upper ventilators shall be located no more than 3 feet (914 mm) below the ridge or highest point of the space, measured vertically, with the balance of the required ventilation provided by eave or cornice vents. Where the location of wall or roof framing members conflicts with the installation of upper ventilators, installation more than 3 feet (914 mm) below the ridge or highest point of the space shall be permitted.~~

R806.1 Ventilation. The requirements for vented and unvented attic space and enclosed rafter space shall be in accordance with this section.

R806.2 Vented attics. Vented attics shall have a minimum net free ventilation area at least 1/300 of the area of the vented space. Between half and two thirds of the provided ventilation shall be installed at the eaves. The ventilation openings shall have a least dimension of 1/16 inch (1.6 mm) minimum and 1/4 inch (6.4 mm) maximum. Ventilation openings having a least dimension larger than 1/4 inch (6.4 mm) shall be provided with corrosion-resistant wire cloth screening, hardware cloth, or similar material with openings having a least dimension of 1/16 inch (1.6 mm) minimum and 1/4 inch (6.4 mm) maximum. Openings in roof framing members shall conform to the requirements of Section

R802.7. Required ventilation openings shall open directly to the outside air. ~~R806.3 Vent and insulation clearance.~~ Where eave or cornice vents are installed, insulation shall not block the free flow of air. A minimum of a 1-inch (25 mm) space shall be provided between the insulation and the roof sheathing and at the location of the vent.

R806.4 R806.2.1 Installation and weather protection. Ventilators shall be installed in accordance with manufacturer's installation instructions. Installation of ventilators in roof systems shall be in accordance with the requirements of Section R903. Installation of ventilators in wall systems shall be in accordance with the requirements of Section R703.1.

R806.5 R806.3 Unvented attic and unvented enclosed rafter assemblies. (no change to current text)

Supporting Statement (including intent, need, and impact of the proposal):

This proposal is submitted to ICC for the 2015 IRC by the Building Code Action Committee (BCAC) and moved forward for the 2012 VRC for the benefit of all users.

1. This section was rewritten to clarify vented and unvented attics. The current charging language in the first sentence of Section R806.1 says that all attics shall have cross ventilation, and yet Section R806.5 acknowledges unvented attics. The new Section R806.1 offers charging language for both conditions.
2. More importantly however, Section 806.2 now incorporates the concepts that were passed in Portland for the IBC, namely that more than half of the incoming ventilation for attics should come from low sources (eaves) and exit up high (roof vent, mechanical vents, gable end vents, etc.). A range is provided: $\frac{1}{2}$ to $\frac{2}{3}$ should be low at the eaves for proper chimney effect. Currently the code would allow 100% of the attic ventilation to be from ridge vents...where would the cross ventilation come from?

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 SBCO (State Building Codes Office)
600 East Main Street
Suite 300
Richmond, VA 23219

Email Address: Vernon.hodge@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7150



VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Mike Toalson-Randy Melvin

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Proposal Information

Code(s) and Section(s): IRC Section Number: M1501.2 Transfer Air (new)

Proposed Change (including all relevant section numbers, if multiple sections):

Modify the section as shown below:

M1501.2 Transfer air (new). Air transferred from occupiable spaces other than kitchens, baths and toilet rooms shall not be prohibited from serving as makeup air for exhaust systems. Transfer openings between spaces shall be of the same cross-sectional area as the free area of the makeup air openings. Where louvers and grilles are installed, the required size of openings shall be based on the net free area of each opening. Where the design and free area of louvers and grilles are not known, it shall be assumed that wood louvers will have 25-percent free area and metal louvers and grilles will have 75-percent free area.

Supporting Statement (including intent, need, and cost impact of the proposal):

The IMC contains language allowing makeup air to be provided from areas other than the room where the exhaust system is located (transfer air). It is just as important to clarify the allowable use of transfer air for exhaust systems in the IRC as it is in the IMC. Without this provision, Section M1503.4 can be interpreted that the total amount of makeup air is required to be introduced in the direct vicinity of the exhaust. This is not required in commercial construction, and so the IRC should be brought into alignment with the IMC in this area. Most of the language is taken from existing sections of the code. They include: Transfer air: IMC Section 403; Transfer openings: Section M1602 Item 6; and Louvers and grilles: Section G2407.10.

Submittal Information

Date Submitted: February 18, 2013

The proposal may be submitted by email as an attachment, by fax, by mail, or by hand delivery.

Please submit the proposal to:

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VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

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Name: Mike Toalson-Randy Melvin

Representing: HBA of Virginia

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randy.melvin@whihomes.com

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Proposal Information

Code(s) and Section(s): IRC Section Number: M1503.4 Makeup Air Required

Proposed Change (including all relevant section numbers, if multiple sections):

Modify the section as shown below:

M1503.4 Makeup air required. Exhaust hood systems capable of exhausting in excess of 400 cubic feet per minute (0.19 m³/s) shall be mechanically or naturally provided with makeup air at a rate approximately equal to the difference between the exhaust air rate and 400 cubic feet per minute. Such makeup air systems shall be equipped with a not less than one damper. Each damper shall be a gravity damper or electrically operated damper that automatically opens when the exhaust system operates ~~means of closure and shall be automatically controlled to start and operate simultaneously with the exhaust system.~~

Exception: Where all appliances in the house are of sealed combustion, power-vent, unvented, or electric, the exhaust hood system shall be permitted to exhaust up to 600 cubic feet per minute (0.28 m³/s) without providing makeup air. Exhaust hood systems capable of exhausting in excess of 600 cubic feet per minute (0.28 m³/s) shall be provided with a makeup air at a rate approximately equal to the difference between the exhaust air rate and 600 cubic feet per minute.

Supporting Statement (including intent, need, and cost impact of the proposal):

As originally written in the 2012 IRC, this section allows range hoods up to 400 cfm to be installed without makeup air. It would be consistent to require makeup air equaling the amount above and beyond 400 cfm for larger fans. Essentially, there would be no difference between the effect a 400 cfm fan has on a house and a 600 cfm fan with 200 cfm of makeup air. This would also improve the feasibility and acceptance of this code section as well as cut down on the amount of wasted energy and potential occupant discomfort caused by needlessly introducing excessive amounts of unconditioned air.

Currently this section of the code does not take into effect the difference between homes where all appliances in the home are of sealed combustion, power-vent, unvented or electric, power and those which contain one or more naturally vented appliances. Because the potential for appliance back drafting is greatly reduced where naturally vented appliances are not present, the 400 cfm threshold can be raised to 600 cfm where only sealed combustion, power-vent, unvented or electric, power appliances are used in the dwelling. This would allow for the use of more effective, common residential, 500 to 600 cfm cooktop down-draft exhaust fans without the need to unnecessarily add makeup air.

Adding the words, "mechanically or naturally" clarify either means of providing the required quantity of make-up air, including transfer air, and the added words "electrical or gravity" clarify either type of damper is allowed. A gravity damper has the added benefit of equalizing depressurization in the house for any other reason such as the use of bath fans and clothes dryers.

Submittal Information

Date Submitted: February 18, 2013

The proposal may be submitted by email as an attachment, by fax, by mail, or by hand delivery.

Please submit the proposal to:

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600 East Main Street
Suite 300
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VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

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Proponent Information

(Check one): Individual Government Entity Company

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Representing: VBCOA IRC Committee

Mailing Address: 9800 Government Center Parkway, Chesterfield, VA, 23832

Email Address: bajnaic@chesterfield.gov

Telephone Number: 804-717-6428

Proposal Information

Code(s) and Section(s): R507 - Decks

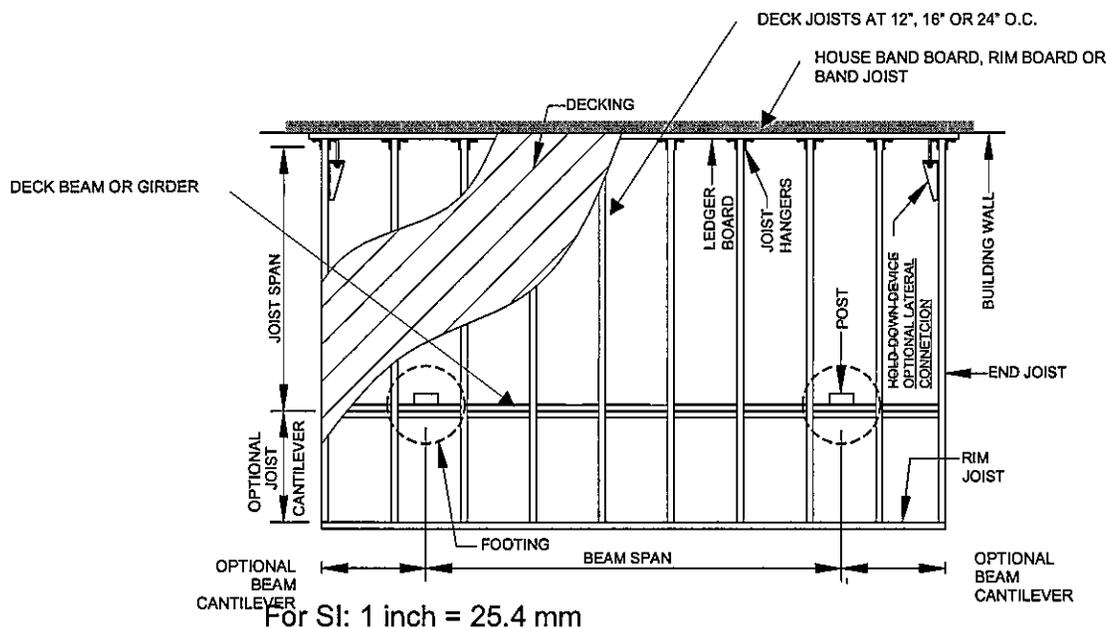
Proposed Change (including all relevant section numbers, if multiple sections):

Delete Section R507 and replace it with the following:

SECTION R507 DECKS

R507.1 Wood decks. Typical wood decks of wood-frame construction shall be designed and constructed in accordance with this section. The use of other grades, other species of lumber or, loading, lesser grade or materials and/or loading conditions not described herein shall be permitted in accordance with Section 301.1.1. Loading for large concentrated loads, such as hot tubs, is beyond the scope of this section.

R507.2 Requirements. Deck construction shall be capable of accommodating applied all vertical and loads lateral loads in accordance with Section R301 and transmitting them to the supporting structural elements. Figure R507.2 is intended for purposes of identifying typical parts, and not to limit the design.



**FIGURE R507.2
DECK CONSTRUCTION**

R507.3 Materials. Materials used in the construction of a wood-framed deck shall comply with the provisions-requirements of this section.

R507.3.1 Preservative-treated lumber. All lumber shall be minimum No 2 grade dimension lumber. Lumber may be cut, drilled and notched in accordance with Section R502.8 except where prohibited in Section R507.112. In geographical areas where decay-resistant lumber is required, All lumber for decks shall be either naturally durable, minimum No.2 grade dimension lumber and identified in accordance with Section R502.1 or, preservative-treated lumber in accordance with Section R317. All lumber in contact with the ground shall be identified as suitable for ground contact. Where termite-resistant lumber is required per Table R301.2 (1), lumber shall comply with Section R318.

R507.3.2 Wood Decking. Wood decking shall comply with any of the following materials:

1. Wood decking with a minimum nominal thickness of $\frac{5}{8}$ inches (32 mm) shall be installed at 90 degrees to deck joists that are spaced at a maximum of 16 inches (406 mm) on center and up to 45 degrees when spaced at a maximum of 12 inches (305 mm) on center.
2. Wood decking with a nominal 2 inch (51 mm) thickness shall be installed at an angle between 45 and 90 degrees to deck joists that are spaced at a maximum of 24 inches (610 mm) on center.

~~3. Wood decking shall be attached to each supporting member with a minimum of (2) 8d threaded nails or (2) #8 wood screws.~~

~~**R507.3.32 Wood/Plastic composites.** Wood/Plastic composites used as exterior deck boards, stair treads, guard and handrails and guardrail systems shall comply with the requirements of R317.4 be permitted and installed in accordance with the manufacturer's installation instructions.~~

~~**R507.3.43 Metal/Other materials.** Metal, glass, concrete or other materials used for deck construction, including guardrail and handrail systems shall be permitted provided it complies with the requirements in Chapter 3 and installed in accordance with the manufacturer's installation instructions.~~

~~**R507.3.5.4 Fasteners and connectors.** Nails, bolts with nuts and washers, screws, and connectors, and fasteners shall be coated in accordance with Section R317.3. Fasteners and connectors shall be installed in accordance with manufacturer's installation instructions. Proprietary fasteners shall be permitted provided they are compatible with the preservative-treated lumber being used. Fasteners and connectors within 300 feet of salt water shoreline shall be stainless steel.~~

~~**R507.3.56 Flashing.** Flashing shall be corrosion-resistant metal of minimum nominal 0.019 inch (0.5 mm) thickness or approved non-metallic material.~~

~~**R507.4 Deck boards.** Deck board spans shall comply with the requirements of Table R507.4. Wood deck boards shall be attached to each supporting member with a minimum of (2) 8d nails or (2) #8 wood screws.~~

**TABLE R507.4
MAXIMUM DECK BOARD SPANS**

<u>MATERIAL TYPE AND NOMINAL SIZE</u>	<u>MAXIMUM ON-CENTER DECK BOARD SPANS</u>	
	<u>BOARDS PERPENDICULAR TO JOIST</u>	<u>BOARDS DIAGONAL TO JOIST^a</u>
<u>5/4-inch thick wood</u>	<u>16 inches</u>	<u>12 inches</u>
<u>2-inch thick wood</u>	<u>24 inches</u>	<u>16 inches</u>
<u>Plastic composite</u>	<u>Per R507.3</u>	<u>Per R507.3</u>

For SI: 1 inch = 25.4 mm

a. Maximum angle of 45 degrees from perpendicular for wood deck boards

~~**R507.4-5 Deck joists.** Spans for typical wood deck joist configurations, as shown in Figure R507.45, shall be measured in accordance with Table R507.45. Deck joists shall be permitted to cantilever a maximum of one-fourth of the actual joist span. Deck joists may be spliced over a deck beam in accordance with R502.6.1.~~

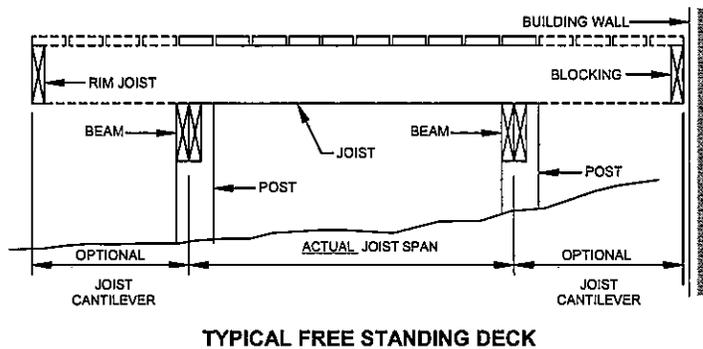
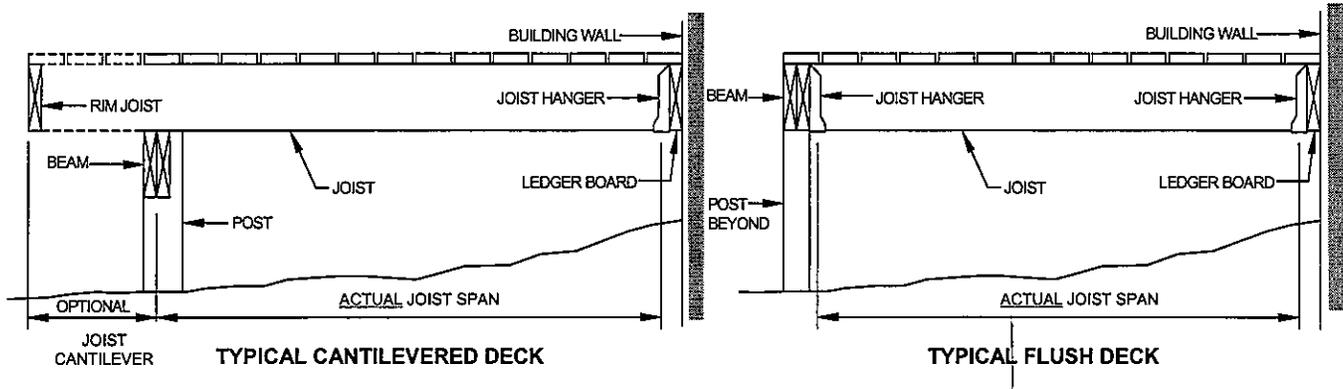


FIGURE R507.5
TYPICAL DECK JOIST CONFIGURATIONS

TABLE R507.45
MAXIMUM DECK JOIST SPANS FOR COMMON LUMBER SPECIES (ft.-in.)

SPECIES ^a	JOIST SIZE	MAXIMUM SPACING OF DECK JOIST SPACING WITHOUT NO CANTILEVER ^{b,f} (in.)			MAXIMUM SPACING OF DECK JOIST SPACING WITH CANTILEVERS ^c (in.)		
		12" o.c.	16" o.c.	24" o.c.	12" o.c.	16" o.c.	24" o.c.
		Southern pine	2 x 6	10-4 9-11	9-5 9-0	7-10 7-7	7-4 6-8
2 x 8	13-8 13-1		12-5 11-10	10-2 9-8	10-9 10-1	10-9 10-1	10-2 9-8
2 x 10	17-5 16-2		15-10 14-0	13-4 11-5	15-6 14-6	15-6 14-0	13-4 11-5
2 x 12	18-0		18-0 16-6	15-5 13-6	18-0	18-0 16-6	15-5 13-6
Douglas fir-larch ^d , hem-fir ^d , spruce-pine-	2 x 6	9-6	8-8	7-2	6-3	6-3	6-3
	2 x 8	12-6	11-1	9-1	9-5	9-5	9-1
	2 x 10	15-8	13-7	11-1	13-7	13-7	11-1

fir ^d	2 x 12	18-0	15-9	12-10	18-0	15-9	12-10
Redwood, western cedars, ponderosa pine ^e , red pine ^e	2 x 6	8-10	8-0	7-0	5-7	5-7	5-7
	2 x 8	11-8	10-7	8-8	8-6	8-6	8-6
	2 x 10	14-11	13-0	10-7	12-3	12-3	10-7
	2 x 12	17-5	15-1	12-4	16-5	15-1	12-4

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

- No. 2 grade with wet service factor.
- Deck joists shall be designed to carry the deck live load in Table R301.5 or the ground snow load, which ever is greater. This table is based on ground snow load or live load = 40 psf, dead load = 10 psf, L/Δ = 360.
- Deck joists shall be designed to carry the deck live load in Table R301.5 or the ground snow load, which ever is greater. This table is based on ground snow load or live load = 40 psf, dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever with a 220 pound point load applied to end.
- Includes incising factor.
- Northern species with no incising factor.
- Joists are permitted to cantilever from the deck beam by a length not to exceed the depth of the deck joist.

R507.45.1 Deck Joist bearingsupport. ~~Joist e~~Ends of deck joists shall be provided supported to prevent with-vertical and lateral supportdisplacement. The ends of joists shall have a minimum of 1.5 inches (38 mm) of bearing on a ~~wooddeck beam, wood ledger board or on metal hangers or metal hangers.~~ Joists shall be connected to deck beams with approved fasteners or connectors. Where lateral support is provided by joist hangers or blocking between joists, the depth of hanger or blocking shall equal not less than 60 percent of the joist depth. Where lateral support is provided by rim joists, the rim joist shall be secured to the end of each joist with a minimum of (3)10d ~~threaded~~ nails or (3)#10x3 inch (76 mm) long wood screws.

R507.5-6 Deck Beams. The maximum allowable deck beam span for Ssingle or multiple ply deck beams shallshall be provided based on the deck joist spans, as shown in Figure R507.2. The maximum deck beam span shall be in accordance with Table R507.56. Beams shall be permitted to cantilever at each end up to one-fourth of the adjacent beam span. The plies of a multi-ply beam shall be fastened with a minimum of two rows of 10d ~~threaded helical or annular shank nails, at 16 inches (406 mm) or equivalent screws or bolts~~ on center along each edge. ~~Splices of multi-span beams shall be located at interior post locations.~~

**TABLE R507.56
MAXIMUM BEAM SPAN LENGTHS ^a (ft-in)**

SPECIES	BEAM SIZE ^b	MAXIMUM MAIN JOIST SPAN (ft.) LESS THAN OR EQUAL TO:						
		6'	8'	10'	12'	14'	16'	18'
Southern pine	(2)-2x6	7-1	6-2	5-6	5-0	4-8	4-4	4-1
		6-11	5-11	5-4	4-10	4-6	4-3	4-0
	(2)-2x8	9-2	7-11	7-1	6-6	6-0	5-7	5-3
		8-9	7-7	6-9	6-2	5-9	5-4	5-0
	(2)-2x10	11-	10-3	9-2	8-5	7-9	7-3	6-10
		10	9-0	8-0	7-4	6-9	6-4	6-0
	(2)-2x12	10-4						
		13-	12-0	10-9	9-10	9-1	8-6	8-0
	(3)-2x6	44	10-7	9-5	8-7	8-0	7-6	7-0
		12-2						
(3)-2x6	8-7	7-8	6-11	6-3	5-10	5-5	5-2	
	8-2	7-5	6-8	6-1	5-8	5-3	5-0	

	(3)-_2x8	11-4 <u>10-10</u>	9-11 <u>9-6</u>	8-11 <u>8-6</u>	8-4 <u>7-9</u>	7-6 <u>7-2</u>	7-0 <u>6-8</u>	6-7 <u>6-4</u>
	(3)-_2x10	14-5 <u>13-0</u>	12-4 <u>11-3</u>	11-6 <u>10-0</u>	10-6 <u>9-2</u>	9-9 <u>8-6</u>	9-1 <u>7-11</u>	8-7 <u>7-6</u>
	(3)-_2x12	17-5 <u>15-3</u>	15-1 <u>13-3</u>	13-6 <u>11-10</u>	12-4 <u>10-9</u>	11-5 <u>10-0</u>	10-8 <u>9-4</u>	10-1 <u>8-10</u>
Douglas fir-larch ^c , spruce-pine-fir, redwood ^c , western cedars, ponderosa pine ^d , red pine ^d	(1) 3x6 or (2)-_2x6	5-5	4-8	4-2	3-10	3-6	3-1	2-9
	(1) 3x8 or (2)-_2x8	6-10	5-11	5-4	4-10	4-6	4-1	3-8
	(1) 3x10 or (2)-_2x10	8-4	7-3	6-6	5-11	5-6	5-1	4-8
	(1) 3x12 or (2)-_2x12	9-8	8-5	7-6	6-10	6-4	5-11	5-7
	(1) 4x6	6-5	5-6	4-11	4-6	4-2	3-11	3-8
	(1) 4x8	8-5	7-3	6-6	5-11	5-6	5-2	4-10
	(1) 4x10	9-11	8-7	7-8	7-0	6-6	6-1	5-8
	(1) 4x12	11-5	9-11	8-10	8-1	7-6	7-0	6-7
	(3)-_2x6	7-4	6-8	6-0	5-6	5-1	4-9	4-6
	(3)-_2x8	9-8	8-6	7-7	6-11	6-5	6-0	5-8
	(3)-_2x10	12-0	10-5	9-4	8-6	7-10	7-4	6-11
	(3)-_2x12	13-11	12-1	10-9	9-10	9-1	8-6	8-1

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

1-a. Deck beams shall be designed to carry the deck live load in Table R301.5 or the ground snow load, whichever is greater. This table is based on ground snow load or live load = 40 psf, dead load = 10 psf, $L/\Delta = 360$ at main span, $L/\Delta = 180$ at cantilever with a 220 pound point load applied to end. No 2 grade, wet service factor.

2-b. Beam depth shall be greater than or equal to depth of joists with a flush beam condition.

3-c. Includes incising factor.

3-d. Northern species with no incising factor.

R507.56.1 Beam bearing. Single-ply beams and multi-ply beams shall bear directly on wood posts or on an approved metal post cap in accordance with Figure R507.67.1 and not less than 3 inches (76 mm) on concrete or masonry.

R507.6.7 Deck posts. For typical single-level wood decks, posts shall be measured from the top of the footing to the underside of the beam. The maximum height of the post shall be in accordance with Table R507.7, the following:

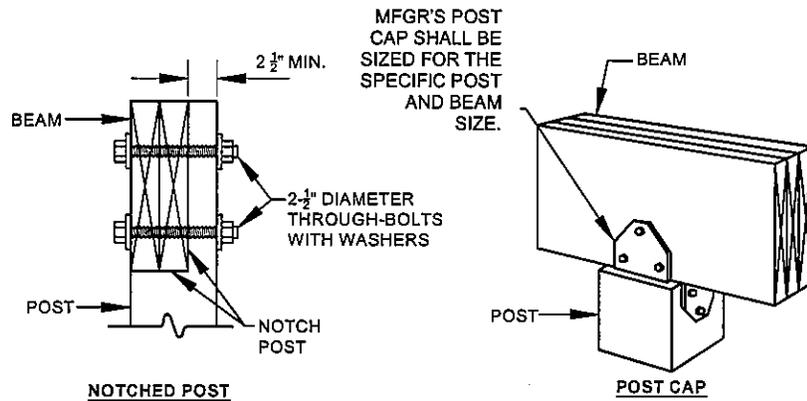
1. Posts comprised of a minimum nominal 4x4 shall be permitted to a maximum height of 8 feet (2438 mm).
 2. Posts comprised of a minimum nominal 6x6 shall be permitted to a maximum height of 14 feet (5486 mm).
 3. Posts comprised of southern pine, of 4x4 or 4x6, grade #2 shall be permitted to a maximum height of 10 feet (3048 mm).
- Posts comprised of southern pine, of 6x6 shall be permitted to a maximum height of 18 feet (5486 mm).

**TABLE R507.7
DECK POST HEIGHT**

NOMINAL DECK POST SIZE	MAXIMUM HEIGHT
4x4	8'
4x6	8'
6x6	14'

For SI: 1 foot = 304.8 mm.

507.7.1 Deck post connection to deck beam connection. Deck beams shall be attached to wood deck posts in accordance with Figure R507.7.1. Other Post to beam connections shall be constructed to resist lateral displacement. Manufactured post-to-beam connectors shall be sized for the post and beam sizes. All bolts shall have washers under the head and nut.



For SI: 1 inch = 25.4 mm

**FIGURE R507.67.1
TYPICAL BEAM BEARING ON WOOD POST**

R507.8 Deck footings. Deck footings shall be constructed in accordance with Section R403 and Figure R507.7. The cross sectional area of the footing shall be adequate to carry the load applied by the posts and the bearing capacity of the soil.

R507.8.1 Footing depth. The minimum depth of footings shall be in accordance with Section R403.1.4 or as approved by the building official. Where a deck footing is within 4 feet of the an adjacent house footing, the deck footing shall bear at the same depth as the adjacent house footing.

R507.8.2 Deck Post connection to footing. ~~Where the top of the footings are at or above grade, the posts shall be restrained to prevent lateral displacement at the bottom end of the post. Where the top of the footings are below grade the post shall be permitted to sit on top of the footing or may be embedded in the concrete.~~ Deck posts shall be restrained to prevent lateral displacement at the bottom end. Such lateral restraint shall be provided by manufactured connectors or a minimum post embedment of 12-inches in surrounding soils or concrete as shown in Figure R507.8.2.

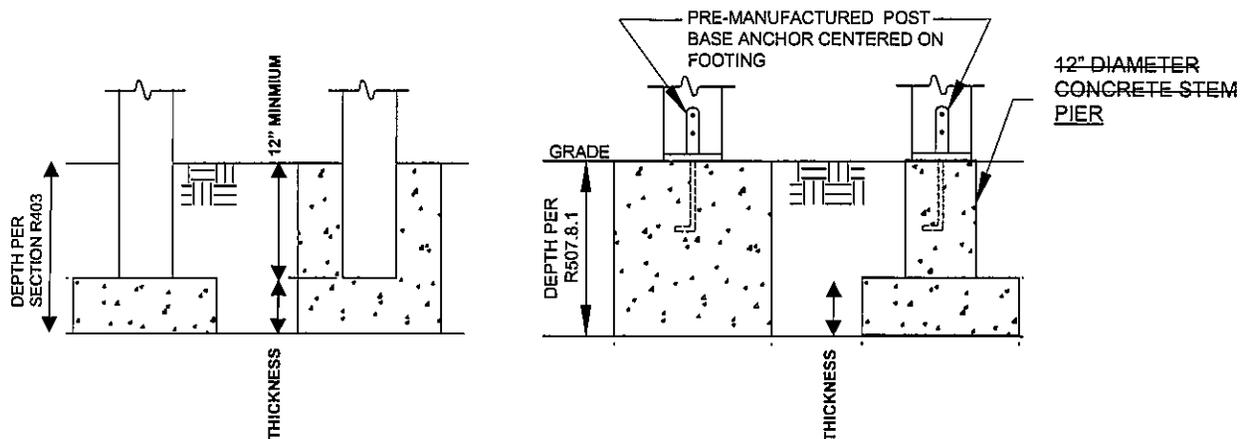


FIGURE R507.8.2
TYPICAL DECK FOOTINGS

R507.9 Deck ledger board connection to the building. The connection between a deck ledger board and the building shall be in accordance with this section.

R507.9.1 Deck ledger board connection to band joist. The deck ledger board shall be connected to a nominal 2-inch thick nominal-lumber band joist with ½-inch lag screws or bolts with washers in accordance with Table R507.8.1 and Figures R507.9.1(1) and R507.9.1(2) and ~~Figure R507.9.1(2)~~. The bolts or lag screws shall be spaced in accordance with Table R507.9.1 ~~Figure R507.9.1(2)~~. As an alternative to the detail in Figure R507.9.1(2), the ledger board shall be permitted to be offset from the house band joist or exterior sheathing a maximum distance of ½ inch (13 mm) with the installation of stacked washers.

The exterior wall finish shall be removed prior to installation of the ledger board. Flashing at a door threshold shall be installed to prevent water intrusion from rain or melting ice and snow.

R507.9.2 Deck ledger board connection to concrete foundation walls. A ledger board shall be connected to a concrete or solid masonry foundation wall with approved ½ inch (13 mm) diameter anchors spaced in accordance with Table R507.9.1(4) and as shown in Figure R507.9.2. Adhesive or mechanical anchors shall be installed per the manufacturer's installation instructions.

R507.9.3 Ledger board connection to hollow masonry foundation wall. A ledger board shall be connected to a hollow masonry foundation wall with approved ½ inch (13 mm) diameter anchors spaced in accordance with Table R507.9.1 ~~epoxy anchors at a spacing specified in Table R507.8.1(1)~~ and as shown in Figure R507.9.3. Adhesive or mechanical anchors shall be installed per the manufacturer's installation instructions.
manufacturer.

R507.9.4 Alternate connections. An approved engineered wood rim board with a minimum thickness of 1 inch (25 mm) shall be permitted to substitute for a 2x lumber band joist provided ~~the engineered wood rim board~~ the engineered wood rim board was designed and by the manufacturer ed to support a deck. A ledger board attachment to a masonry or stone veneer, ribbon board of open web floor trusses, band joist of a cantilevered floor ~~and or~~ other conditions not addressed herein shall be designed in accordance with accepted engineering practice, or the deck shall be free-standing in accordance with Section R507.140.

**TABLE R507.9.1 (1)
FASTENER SPACING**

FASTENER	BAND BOARD	JOIST SPAN						
		≤6'	> 6'-8'	> 8'-10'	> 10'-12'	> 12'-14'	> 14'-16'	> 16'-18'
½" lag screws ^a	1" min. engineered wood product	24"	18"	14"	12"	10"	9"	8"
	2x lumber	30"	23"	18"	15"	13"	11"	10"
½" through bolts	1" min. engineered wood product	24"	18"	14"	12"	10"	9"	8"
	2x lumber	36"	36"	34"	29"	24"	21"	19"
½" through bolts and ½" stacked washers ^b	1" min. engineered wood product	24"	18"	14"	12"	10"	9"	8"
	2x lumber	36"	36"	29"	24"	21"	18"	16"
Expansion Mechanical anchors ^c	-	36"	36"	34"	29"	24"	21"	19"
Epoxy Adhesive anchors ^d	-	32"	32"	32"	24"	24"	16"	16"

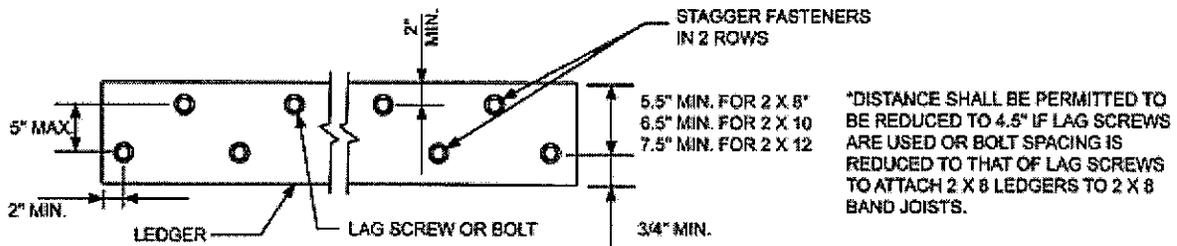
b-For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm

a. The tip of the lag screw shall fully extend beyond the inside face of the band board.

b. The maximum gap between the face of the ledger board and face of the wall sheathing shall be ½ inches (13 mm).

c. Mechanical anchors shall have a minimum allowable shear of 725 pounds, and a minimum allowable tension of 505 pounds

d. Adhesive anchors shall have a minimum allowable shear of 675 pounds, and a minimum allowable tension of 505 pounds.



For SI: 1 inch = 25.4 mm.

**FIGURE R507.9.1(1)
PLACEMENT OF LAG SCREWS AND BOLTS IN LEDGER BOARDSS**

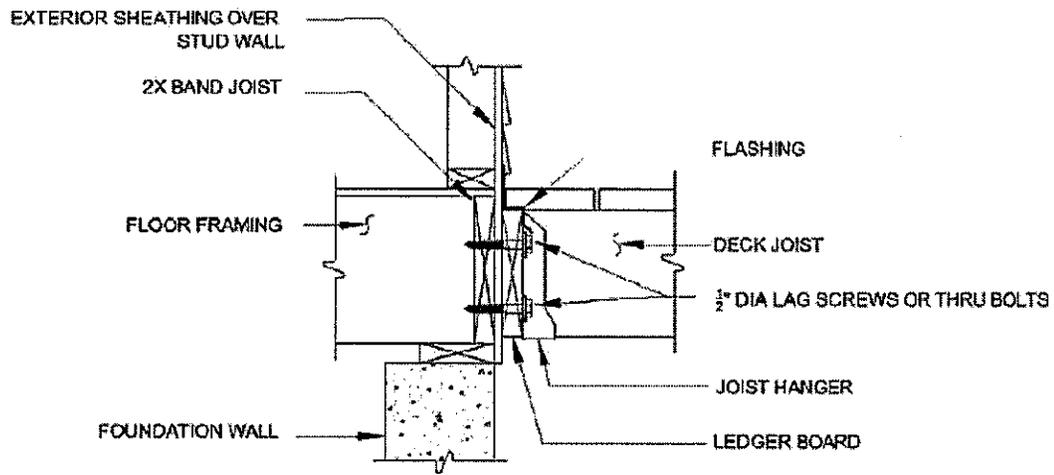


FIGURE R507.9.1(2)
LEDGER BOARD TO HOLLOW MASONRY FOUNDATION WALL ATTACHMENT
LEDGER BOARD TO SOLID FOUNDATION WALL ATTACHMENT

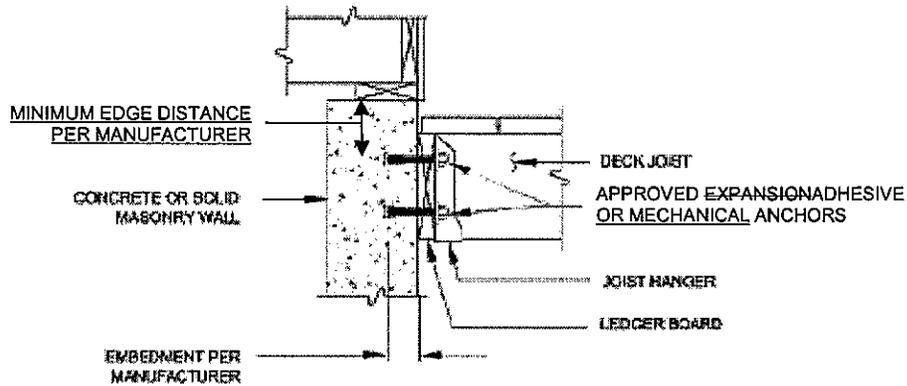


FIGURE R507.9.2
LEDGER BOARD TO BAND BOARD JOIST ATTACHMENT

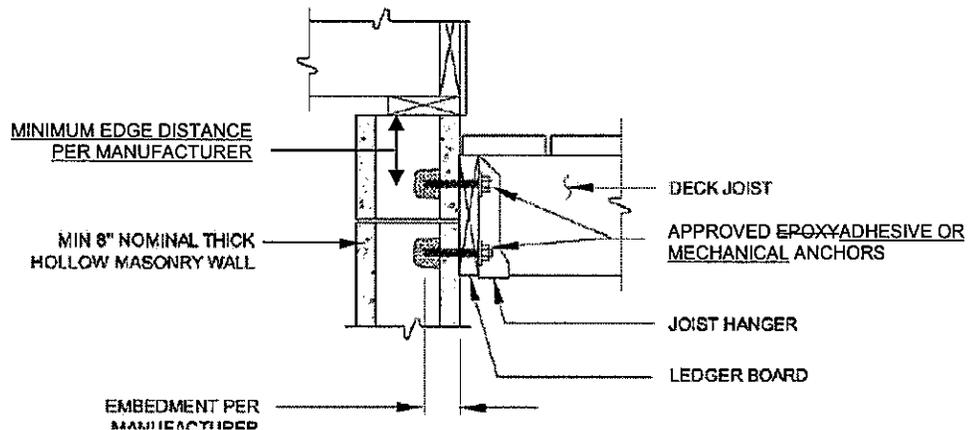
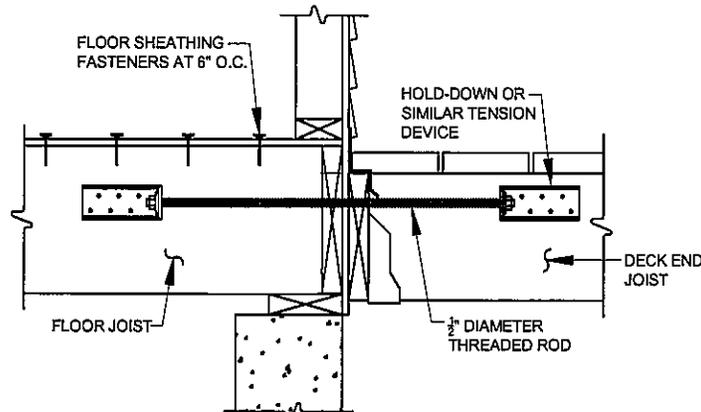


FIGURE R507.9.23
LEDGER BOARD TO SOLID FOUNDATION WALL ATTACHMENT
LEDGER BOARD TO HOLLOW MASONRY FOUNDATION WALL ATTACHMENT

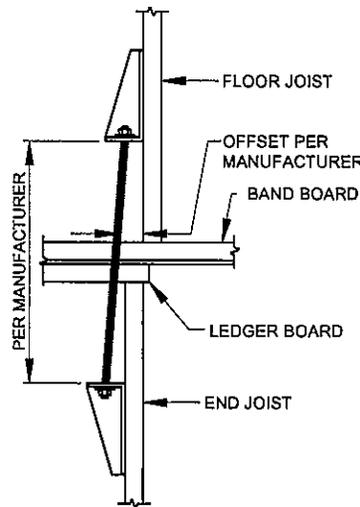
R507.9.5 Attachment to resist lateral load. A lateral load connection is required by Section R507.2. The following options shall be deemed to comply; other design solutions are permitted in accordance with R301.

R507.9.5.1 Connection at parallel joists. Where floor joists and deck joists are parallel to each other, a hold-down or similar tension device with a minimum capacity of 1,500 pounds (6672 N) at each end joist as shown in Figures R507.9.5.1(1) and R507.9.5.1(2) shall be permitted. The hold-down device shall be located within 24 inches of each end joist. Floor sheathing fasteners shall be permitted to be substituted with two reinforcing angles with a minimum capacity of 375 pounds (1668 N) each on each side of the joist with a minimum capacity of 375 pounds (1668 N).

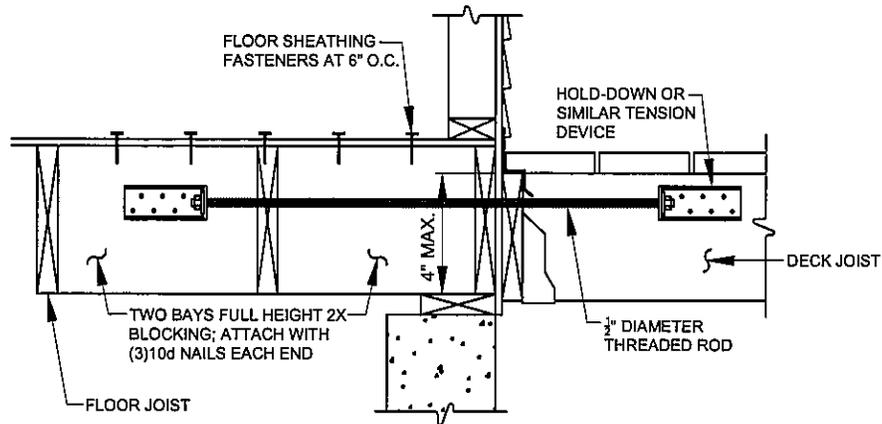
R507.9.5.2 Connection at perpendicular joists. Where the floor joists and deck joists are perpendicular to each other, a hold-down or similar tension device with a minimum capacity of 1,500 pounds (6672 N) shall be provided as shown in Figure R507.9.5.2. The hold-down device shall be located within 24 inches of each end joist. The floor joist sheathing fasteners shall be permitted to be substituted with two reinforcing angles with a minimum capacity of 375 pounds (1668 N) each on each side of the joist with a minimum capacity of 375 pounds (1668 N).



**FIGURE R507.9.5.1(1)
CONNECTION AT PARALLEL JOISTS**



**FIGURE R507.9.5.1(2)
OFFSET AT PARALLEL JOISTS**



For SI: 1 inch = 25.4 mm

FIGURE R507.9.5.2
LATERAL SUPPORT WHERE INTERIOR JOIST PERPENDICULAR TO DECK

R507.10 Free-standing decks. As shown in Figures R507.5 and R507.10, free-standing decks shall have an additional beam and posts adjacent the building exterior wall in place of a ledger board attachment. The beam shall be sized in accordance with Section R507.6 and shall be located adjacent the exterior wall or at a maximum distance equal to the allowable joist cantilever.

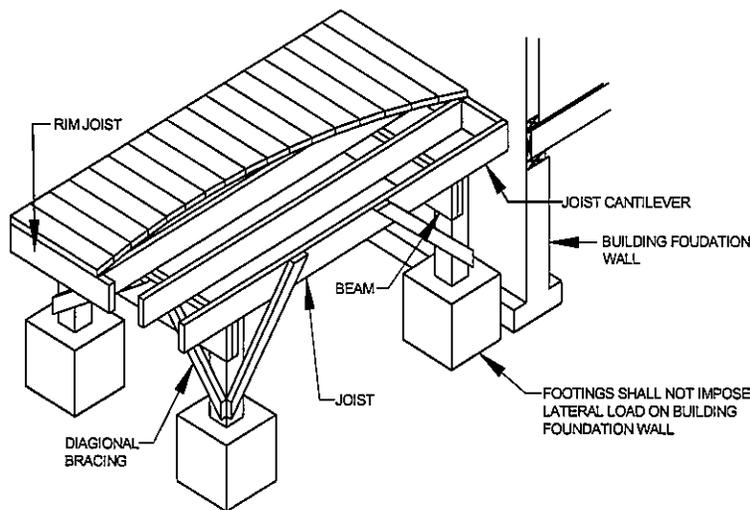
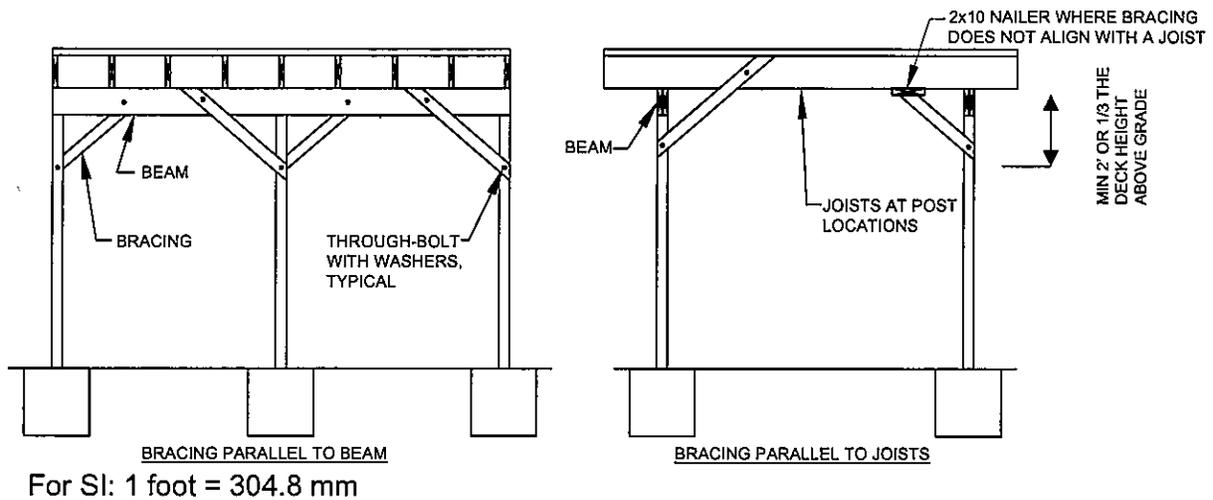


FIGURE R507.10
TYPICAL FREE-STANDING DECK

R507.10.1 Diagonal bracing. Diagonal bracing shall be provided in accordance with Figure R507.10.1 on free-standing decks greater than 30 inches above grade. Bracing shall be placed at a 45 degree angle at each post location in the parallel and perpendicular directions to the beam. Bracing shall be a minimum of nominal 2x4 lumber and shall be fastened to framing with one 1/2 inch (9 mm) diameter through bolt with washers at each side of each end. The point of connection of the diagonal brace to the post shall be a minimum of 2 feet below the top surface of the deck or at least 1/3 the height of the deck above grade.

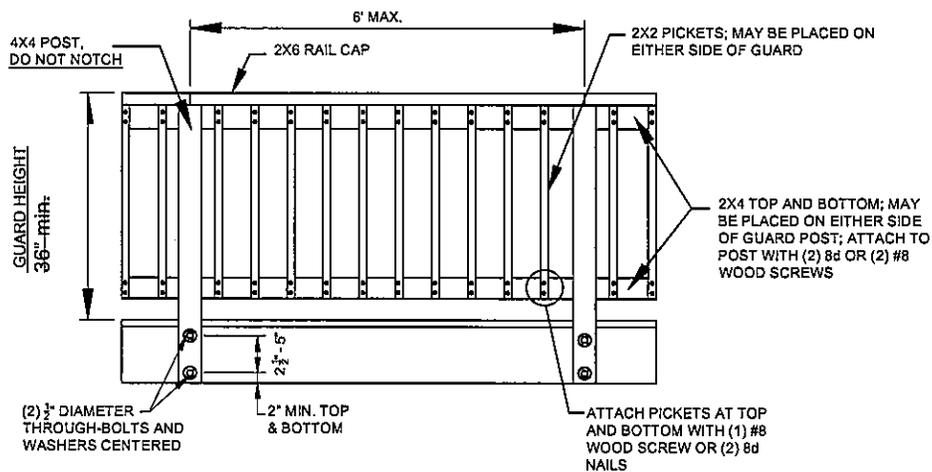


**FIGURE R507.10.1
FREE-STANDING DECK DIAGONAL BRACING**

R507.11 Deck guards. Deck guards shall be designed and constructed in accordance with Sections R301.5 and R312. Other materials and construction techniques details shall be permitted in accordance with Section R301. Deck guards shall not be notched.

R507.11.1 Guard construction. Guard posts shall be attached to the inside or outside face of the rim joist or end as shown in Figures R507.11.1(1) through R507.11.1(3). Hold-down anchors shall have a minimum capacity of 1,800 pounds (8006 N).

R507.11.2 Guard rail construction. The guard rail cap shall be nailed to the top of the guard post with a minimum of four 16d common nails or #12 by 3" long screws, or an alternate connection that will resist 200 pounds of shear force.



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm

**FIGURE R507.11.1(1)
TYPICAL DECK GUARD CONFIGURATION**

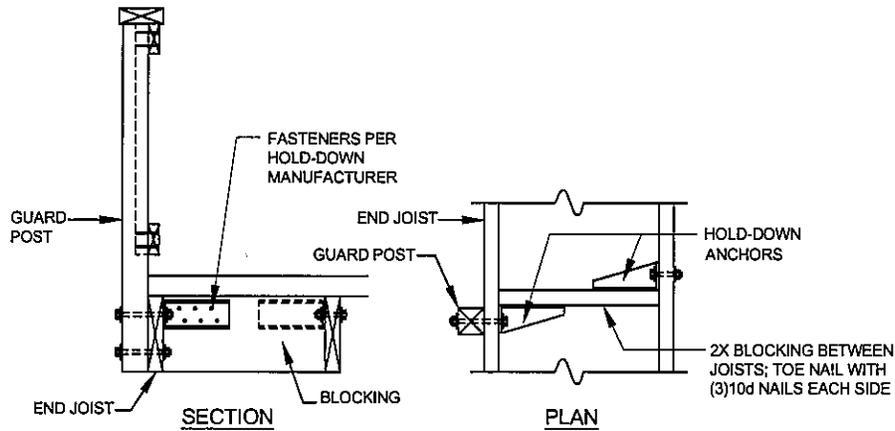


FIGURE R507.11.1(2)
GUARD POST TO END JOIST CONNECTION

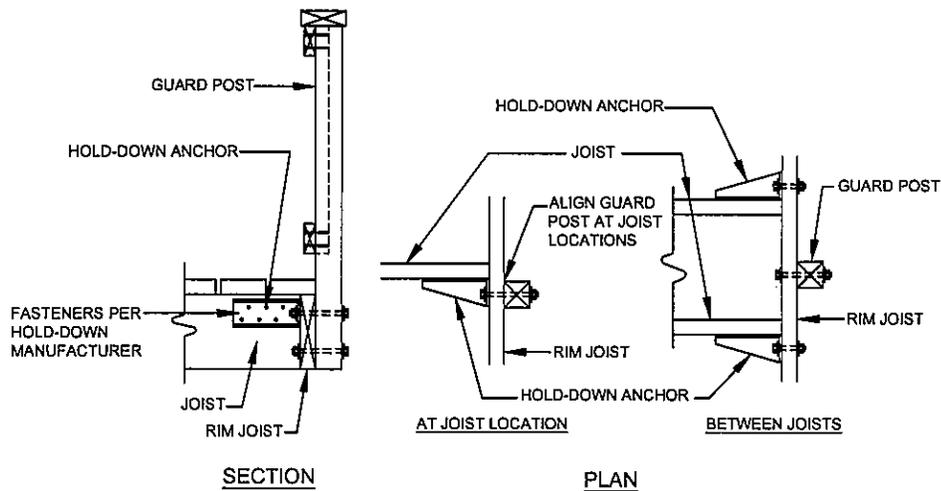
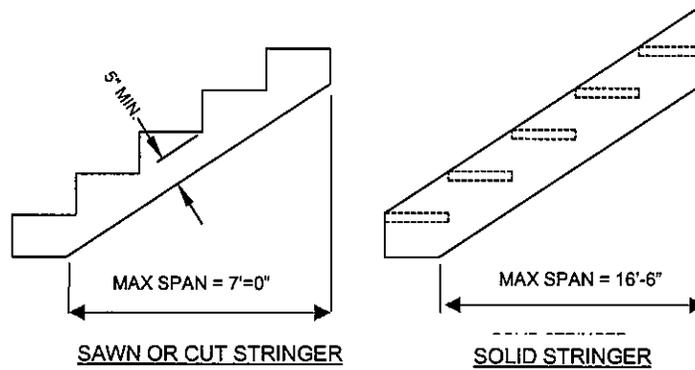
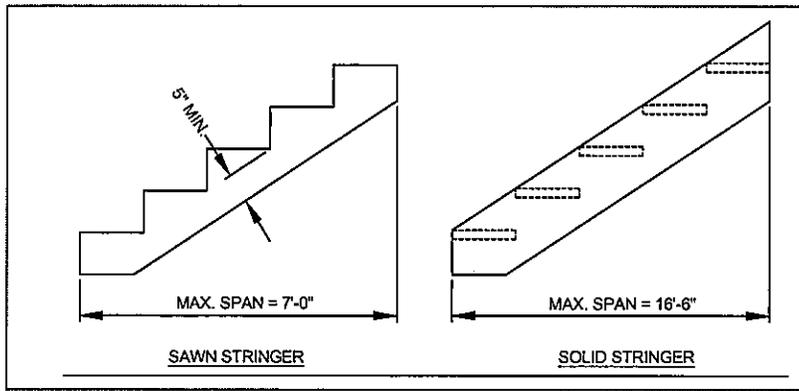


FIGURE R507.11.1(3)
GUARD POST TO RIM JOIST CONNECTION

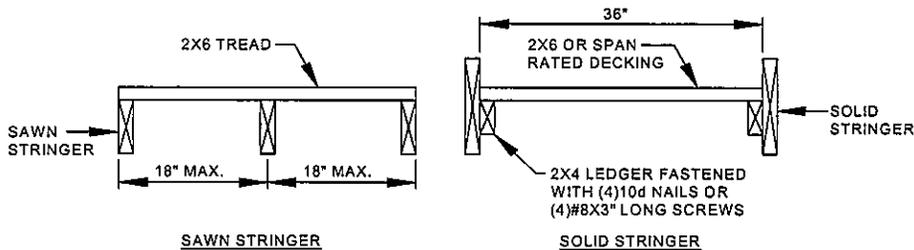
R507.12 Deck stairs. Deck stairs shall be constructed in accordance with this section and Section R311.7. Where a flight of stairs has a vertical rise greater than that allowed per Section R311.7.3, an intermediate landing shall be provided, in accordance with Section R311.7.6 and designed as a free-standing deck in accordance with Section R507.10.

R507.12.1 Stair stringers. Stair stringers shall be constructed of nominal 2x12 lumber as shown in Figures R507.12.1(1) and R507.12.1(2). Stringers with spans greater than those shown in Figure R507.12.1(1) shall be supported with posts and footings spaced along its length.



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm

**FIGURE R507.12.1(1)
STAIR STRINGER REQUIREMENTS**

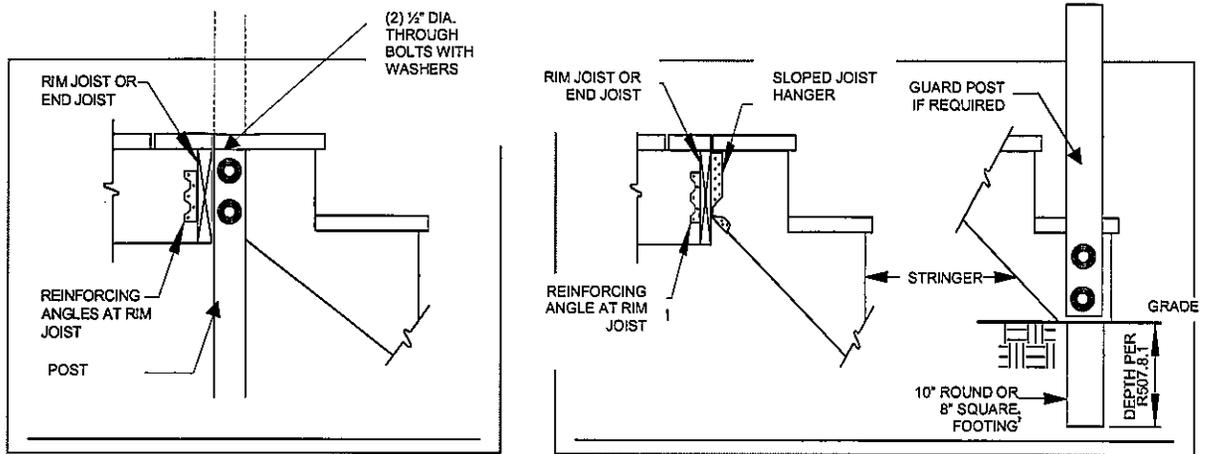


For SI: 1 inch = 25.4 mm

**FIGURE R507.12.1(32)
STRINGER WIDTH REQUIREMENTS**

R507.13.2 Stringer bearing. ~~Stringers shall be attached to posts or bear on joist hangers attached to the deck structure and on footings at grade in accordance with Figure R507.13.2. Joist hangers shall be specifically designed to accommodate sloped connections and shall have a minimum capacity of 625~~

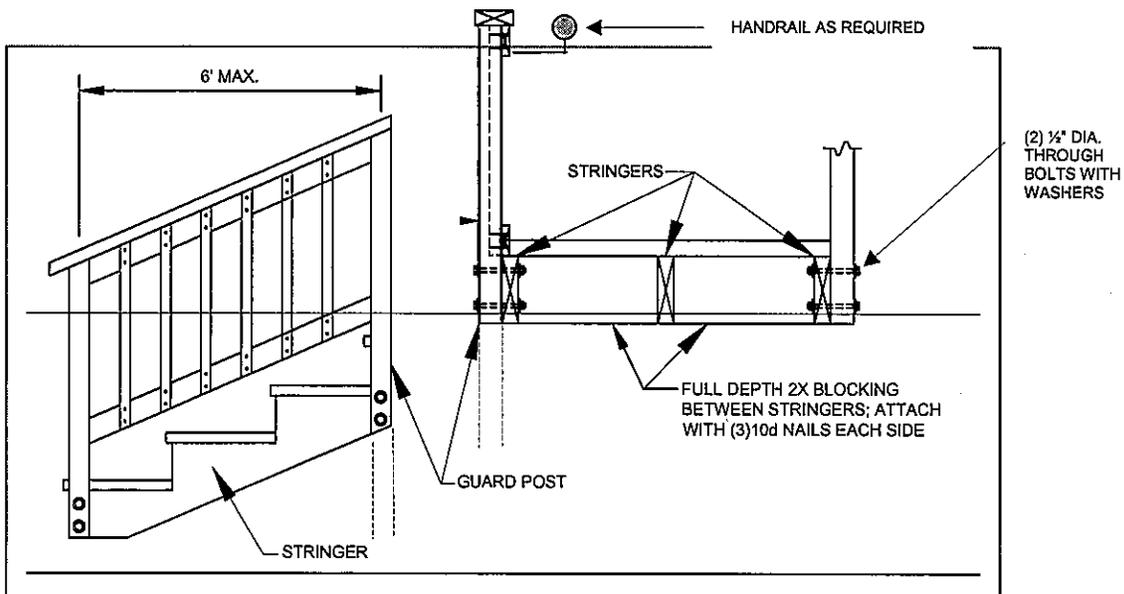
pounds (2780 N). Reinforcing angles at rim joist locations only shall have a minimum capacity of 325 pounds (1446 N).



**FIGURE R507.13.2
STRINGER BEARING**

R507.12.3-2 Treads and risers. Stair treads shall be constructed in accordance with Section R311.7 and Figure R507.12.1(2). Treads shall be composed of nominal 2x6 lumber or plastic composites. Treads of stairs constructed with solid stringers shall be permitted to be composed of span rated decking. Risers shall be permitted to be composed of nominal 1x lumber. Openings in risers shall not allow the passage of a 4 inch (102 mm) diameter sphere.

R507.12.4-3 Stair guard. Guards for stairs shall be as required per Section R312.1.1.



For SI: 1 foot = 304.8 mm

**FIGURE R507.13.4
STAIR GUARD CONNECTION**

R507.12.5-4 Stair handrail. A stair handrail may be required per Section R311.7.8. When a guard is required in accordance with Section R312.1.1, the top rail shall comply with the handrail grip size requirements of Section R311.7.8.3 or a separate handrail in accordance with Section R311.7.8.3 shall be provided. ~~When required and where the top guard rail does not comply with the handrail grip size requirements in Section R311.7.8.3, a separate, conforming handrail shall be required.~~

R507.13.6-13 Ramps. Ramps from decks shall be as required in Section R311.8. Details for stringers, guards and handrails shall be similar to those for stairs.

Reason:

This proposal was originally submitted to address the lack of prescriptive deck construction details in the IRC. Prescriptive details are needed in the code to help the "weekend warrior" or other inexperienced builders who do not build decks on a regular basis. The construction of safe decks is an important issue that warrants inclusion in the IRC.

The committee in Dallas agreed that Section R507 was woefully deficient in providing minimum prescriptive deck criteria. This public comment integrates many comments from multiple interested parties.

Arguing in support of this proposal in Dallas, several proponents rightfully pointed out that many jurisdictions across the country have deferred to DCA6 as an acceptable guide for building decks. In the absence of IRC criteria, DCA6 was a respected alternative. This submission is based on many of the provisions in DCA6.

The opponents in Dallas argued that some of the details were different than those used in their parts of the country. They missed the opening sentences in the first section – that this proposed code change was intended to provide 1) *typical* requirements and details and 2) other materials and methods were equally acceptable. I argued that providing minimum requirements for the average homeowner in no way was intended to stifle deck craftsmen.

I have been sent numerous examples of engineered solutions and commonly accepted details from many parts of the country. There are YouTube videos from well established stores, like Home Depot, that are offering "how to" videos that are teaching the average homeowner wrong ways to build decks. Some of these are so egregiously wrong that they could jeopardize life safety. In the absence of good code, the handy homeowner will resort to anything and think he/she is safe...to paraphrase a TV commercial: "everyone knows that everything on the internet is correct"

In conclusion, the average deck builders, plan reviewers and inspectors have nothing in the IRC to help them with a deck design. Homeowners and non-professionals need to have simple prescriptive methods for building a safe deck, and we believe this proposal provides those guidelines. I strongly recommend that you support RB268 so that we will have prescriptive criteria in the code for building decks.

Supporting Statement (including intent, need, and impact of the proposal):

The current deck code Section R507 is new to the 2012 IRC. It was created to put all of the connection details for anchoring the deck to the house in one place. However it does not provide any prescriptive requirements for building a deck.

Currently about one-third of the building permits in our county are for decks. The vast majority of these decks are to be built by homeowners. Since the current code provides them no prescriptive guidelines, many jurisdictions across the country have tried to help by creating local, deck guides or aiming the weekend warrior to DCA6 by the American Wood Council.

This submittal is not intended to describe every possible combination of design features that professional, custom deck builders are so proud of creating for *Deck Builders Magazine*. Rather this section is simplified so the average person can understand the requirements, size their materials and have a reasonable expectation that the deck will be safe.

Section R507 borrows heavily from DCA6 and uses the "wet" span tables to size the joists. If DHCD decides to use the new span tables just adopted by the Southern Pine folks the tables will have to be adjusted accordingly.

This is the same proposal I have submitted to ICC for the 2015 IRC to be heard in Dallas.

Submittal Information

Date Submitted: 2-12-2012

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 SBCO (State Building Codes Office)
600 East Main Street
Suite 300
Richmond, VA 23219

Email Address: Vernon.hodge@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7150



VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Bryan Deem

Representing: Stafford County

Mailing Address: 359 Laurel Drive, Aylett, Virginia 23009

Email Address: bdeem@co.stafford.va.us

Telephone Number: 540-658-4504

Proposal Information

Code(s) and Section(s): IRC table R507.2.

Proposed Change (including all relevant section numbers, if multiple sections):

I propose to replace table R507.2 in the IRC with Table 5 from the DCA 6.

Supporting Statement (including intent, need, and impact of the proposal):

Table R507.2 in the International Residential Code is restrictive to the extent that it does not apply to many existing installations. While the IRC limits ledger attachment to either solid sawn or LVL band joists, a majority of existing homes use rim board or other engineered wood products (EWP's) for band joist material.

The Design for Code Acceptance for Decks (version 6) incorporates a table that permits ledger attachment to EWP with some conditional restraints. This table would grant more flexibility for contractors to achieve a sound ledger attachment prescriptively.

Submittal Information

Date Submitted: 6/13/12

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)
600 East Main Street
Suite 300
Richmond, VA 23219

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 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual(s) Government Entity Company

Name: Bryan Deem

Representing: Stafford County

Mailing Address: 359 Laurel Drive, Aylett, Virginia 23009

Email Address: bdeem@co.stafford.va.us

Telephone Number: 540-658-4504

Proposal Information

Code(s) and Section(s): Change section 507.2.3

Proposed Change (including all relevant section numbers, if multiple sections):

R507.2.3 Deck lateral load connection.

The lateral load connection required by Section R507.1 shall be permitted to be in accordance with Figure R507.2.3. Where the lateral load connection is provided in accordance with Figure 507.2.3, hold-down tension devices shall be installed in not less than two locations per deck. The devices shall be placed on either of the first two joists at both ends of the deck. Each device shall have an allowable stress design capacity of not less than 1500 pounds (6672 N).

Supporting Statement (including intent, need, and impact of the proposal):

Reason:

The Residential code gives a prescription to achieve lateral bracing but without specifying placement details such a system can become ineffective with that which they purport to do. Under the existing provision the installer could place both hold down devices on one side of the deck or place the ineffectively close together. The decking can act essentially as a shearwall or diaphragm if the hold downs are placed proportionately.

Submittal Information

Date Submitted: 6/13/12

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)
600 East Main Street
Suite 300
Richmond, VA 23219

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 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: John S. Trenary, CBO Representing: Region III VBCOA / Frederick County

Mailing Address: Frederick County Inspections Department, 107 N. Kent Street, Winchester VA 22601

Email Address: jtrenary@co.frederick.va.us Telephone Number: (540)665-5650

Proposal Information

Code(s) and Section(s): IRC 2012 Section R507.2.3 Deck lateral load connection

Proposed Change (including all relevant section numbers, if multiple sections):

R507.2.3 Deck lateral load connection. The lateral load connection required by Section R507.1 shall be permitted to be in accordance with Figure R507.2.3. Where the lateral load connection is provided in accordance with Figure 507.2.3, hold-down tension devices shall be installed in not less than two locations per deck, ____ each device shall **be spaced so one is located in each end of the deck attachment at a minimum distance apart of one third of the horizontal length** and have an allowable stress design capacity of not less than 1500 pounds (6672N).

Supporting Statement (including intent, need, and impact of the proposal):
This code change would clarify the intent of the code for the proper spacing of the tension devices when they are utilized. The current language would not prevent the installation of the two devices at a single location.

Cost Impact: This code change should not increase the cost of construction.

Submittal Information

Date Submitted: June 13, 2012

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)
600 East Main Street
Suite 300
Richmond, VA 23219

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 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: VBCOA IRC Committee

Proposal Information

Code(s) and Section(s): VCC (IRC)

Proposed Change (including all relevant section numbers, if multiple sections):

Change the definition of "Attic, habitable" in the IRC to read as shown below:

ATTIC, HABITABLE. A finished or unfinished area, not considered a *story*, complying with all of the following requirements:

1. The occupiable floor area is at least 70 square feet (17m²), in accordance with Section R304,
2. The occupiable floor area has a ceiling height in accordance with Section R305, and
3. The occupiable space is enclosed by the roof assembly above, knee walls (if applicable) on the sides and the floor-ceiling assembly below.

Habitable attics shall not be permitted in dwellings or townhouses that are three stories above grade plane in height.

Supporting Statement (including intent, need, and cost impact of the proposal):

The intent of this proposal is to restore the number of habitable area stories above grade to three, consistent with scope of the IRC. R101.2 'Scope' limits the application of the IRC to one- and two-family dwellings and townhouses "not more than three stories above grade plane in height"...; the current language in the 'Attic, Habitable' definition: "not considered a story" allows for an additional habitable level above the three story limitation, or in practical terms - a fourth story.

Cost impact: There is no cost impact in this change.

Submittal Information

Please submit the proposal to:

DHCD DBFR SBCO (State Building Codes Office)

600 East Main Street

Suite 300

Richmond, VA 23219

Email Address: Vernon.hodge@dhcd.virginia.gov

Fax Number: (804) 371-7092

Phone Numbers: (804) 371-7150



VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: DHCD Staff

Representing: _____

Proposal Information

Code(s) and Section(s): VCC, IRC Section E3902.2

Proposed Change (including all relevant section numbers, if multiple sections):

Add the following exception to Section E3902.2 of the IRC:

E3902.2 Garage and accessory building receptacles. All 125-volt single-phase, 15- and 20-ampere receptacles installed in garages and grade-level portions of unfinished accessory buildings used for storage or work areas shall have ground-fault circuit-interrupter protection for personnel.

Exception: Receptacles in garages used solely for refrigeration appliances or for garage door opening equipment.

Supporting Statement (including intent, need, and cost impact of the proposal):

This proposal is based on discussion at the May 20, 2013 BHCD meeting where it was suggested that the need for GFCI protection is minimal when outlets are used solely for refrigeration appliances in garages or for garage door opening equipment and the exception would prevent nuisance tripping of GFCI devices which can lead to loss of freezer contents or the ability of a garage door opener to operate.

Submittal Information

Date Submitted: June 18, 2013

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 SBCO (State Building Codes Office)
600 East Main Street
Suite 300
Richmond, VA 23219

Email Address: Vernon.hodge@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7150



VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Sam Francis

Representing: American Wood Council

Mailing Address: 1 Dutton Farm Lane; West Grove, PA 19390

Email Address: sfrancis@awc.org

Telephone Number: 610-869-4774

Proposal Information

Code(s) and Section(s): Virginia Construction Code Residential: Table R502.3.1(1), Table R502.3.1(2), Table R502.3.1(3), Table R502.3.3(1), Table R502.3.3(2), Table R502.5(1), Table R502.5(2), Table R602.7.1, Table R802.4(1), Table R802.4(2), Table R802.5.1(1), Table R802.5.1(2), Table R802.5.1(3), Table R802.5.1(4), Table R802.5.1(5), Table R802.5.1(6), Table R802.5.1(7), Table R802.5.1(8)

Proposed Change (including all relevant section numbers, if multiple sections):

Revisions to the following tables to reflect new Southern Pine design values.

Table R502.3.1(1), Table R502.3.1(2), Table R502.3.1(3), Table R502.3.3(1), Table R502.3.3(2), Table R502.5(1), Table R502.5(2), Table R602.7.1, Table R802.4(1), Table R802.4(2), Table R802.5.1(1), Table R802.5.1(2), Table R802.5.1(3), Table R802.5.1(4), Table R802.5.1(5), Table R802.5.1(6), Table R802.5.1(7), Table R802.5.1(8)

Tables are attached in a separate file.

Supporting Statement (including intent, need, and cost impact of the proposal):

The American Lumber Standard Committee, Board of Review, approved new design values for Southern Pine lumber to become effective June 1, 2013. In order for the USBC to reflect the most current data, these tables in the IRC portion of the USBC need to be amended to reflect the new values.

Submittal Information

Date Submitted: May 1, 2013

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 SBCO (State Building Codes Office)
600 East Main Street
Suite 300
Richmond, VA 23219

Email Address: Vernon.hodge@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7150



TABLE R502.3.1(1)
FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES
 (Residential sleeping areas, live load = 30 psf, L/Δ = 360)^a

JOIST SPACING (Inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf				DEAD LOAD = 20 psf			
			2 × 6	2 × 8	2 × 10	2 × 12	2 × 6	2 × 8	2 × 10	2 × 12
			Maximum floor joist spans							
			(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)
12	Douglas fir-larch	SS	12-6	16-6	21-0	25-7	12-6	16-6	21-0	25-7
	Douglas fir-larch	#1	12-0	15-10	20-3	24-8	12-0	15-7	19-0	22-0
	Douglas fir-larch	#2	11-10	15-7	19-10	23-0	11-6	14-7	17-9	20-7
	Douglas fir-larch	#3	9-8	12-4	15-0	17-5	8-8	11-0	13-5	15-7
	Hem-fir	SS	11-10	15-7	19-10	24-2	11-10	15-7	19-10	24-2
	Hem-fir	#1	11-7	15-3	19-5	23-7	11-7	15-2	18-6	21-6
	Hem-fir	#2	11-0	14-6	18-6	22-6	11-0	14-4	17-6	20-4
	Hem-fir	#3	9-8	12-4	15-0	17-5	8-8	11-0	13-5	15-7
	Southern pine	SS	12-3	16-2	20-8	25-1	12-3	16-2	20-8	25-1
	Southern pine	#1	12-0-11-10	15-10-15-7	20-3-19-10	24-8-24-2	12-0-11-10	15-10-15-7	20-3-18-7	24-8-22-0
	Southern pine	#2	11-10-11-3	15-7-14-11	19-10-18-1	24-2-21-4	11-10-10-9	15-7-13-8	18-7-16-2	21-9-19-1
	Southern pine	#3	10-5-9-2	13-3-11-6	15-8-14-0	18-8-16-6	9-4-8-2	11-11-10-3	14-0-12-6	16-8-14-9
	Spruce-pine-fir	SS	11-7	15-3	19-5	23-7	11-7	15-3	19-5	23-7
	Spruce-pine-fir	#1	11-3	14-11	19-0	23-0	11-3	14-7	17-9	20-7
	Spruce-pine-fir	#2	11-3	14-11	19-0	23-0	11-3	14-7	17-9	20-7
	Spruce-pine-fir	#3	9-8	12-4	15-0	17-5	8-8	11-0	13-5	15-7
16	Douglas fir-larch	SS	11-4	15-0	19-1	23-3	11-4	15-0	19-1	23-0
	Douglas fir-larch	#1	10-11	14-5	18-5	21-4	10-8	13-6	16-5	19-1
	Douglas fir-larch	#2	10-9	14-1	17-2	19-11	9-11	12-7	15-5	17-10
	Douglas fir-larch	#3	8-5	10-8	13-0	15-1	7-6	9-6	11-8	13-6
	Hem-fir	SS	10-9	14-2	18-0	21-11	10-9	14-2	18-0	21-11
	Hem-fir	#1	10-6	13-10	17-8	20-9	10-4	13-1	16-0	18-7
	Hem-fir	#2	10-0	13-2	16-10	19-8	9-10	12-5	15-2	17-7
	Hem-fir	#3	8-5	10-8	13-0	15-1	7-6	9-6	11-8	13-6
	Southern pine	SS	11-2	14-8	18-9	22-10	11-2	14-8	18-9	22-10
	Southern pine	#1	10-11-10-9	14-5-14-2	18-5-18-0	22-5-21-4	10-11-10-9	14-5-13-9	17-11-16-1	21-4-19-1
	Southern pine	#2	10-9-10-3	14-2-13-3	18-0-15-8	21-1-18-6	10-5-9-4	13-6-11-10	16-1-14-0	18-10-16-6
	Southern pine	#3	9-0-7-11	11-6-10-10	13-7-12-1	16-2-14-4	8-1-7-1	10-3-8-11	12-2-10-10	14-6-12-10
	Spruce-pine-fir	SS	10-6	13-10	17-8	21-6	10-6	13-10	17-8	21-4
	Spruce-pine-fir	#1	10-3	13-6	17-2	19-11	9-11	12-7	15-5	17-10
	Spruce-pine-fir	#2	10-3	13-6	17-2	19-11	9-11	12-7	15-5	17-10
	Spruce-pine-fir	#3	8-5	10-8	13-0	15-1	7-6	9-6	11-8	13-6

(continued)

TABLE R502.3.1(1)—continued
FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES
(Residential sleeping areas, live load = 30 psf, L/Δ = 360)^a

JOIST SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf				DEAD LOAD = 20 psf			
			2 × 6	2 × 8	2 × 10	2 × 12	2 × 6	2 × 8	2 × 10	2 × 12
			Maximum floor joist spans							
		(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	
19.2	Douglas fir-larch	SS	10-8	14-1	18-0	21-10	10-8	14-1	18-0	21-0
	Douglas fir-larch	#1	10-4	13-7	16-9	19-6	9-8	12-4	15-0	17-5
	Douglas fir-larch	#2	10-1	12-10	15-8	18-3	9-1	11-6	14-1	16-3
	Douglas fir-larch	#3	7-8	9-9	11-10	13-9	6-10	8-8	10-7	12-4
	Hem-fir	SS	10-1	13-4	17-0	20-8	10-1	13-4	17-0	20-7
	Hem-fir	#1	9-10	13-0	16-4	19-0	9-6	12-0	14-8	17-0
	Hem-fir	#2	9-5	12-5	15-6	17-1	8-11	11-4	13-10	16-1
	Hem-fir	#3	7-8	9-9	11-10	13-9	6-10	8-8	10-7	12-4
	Southern pine	SS	10-6	13-10	17-8	21-6	10-6	13-10	17-8	21-6
	Southern pine	#1	10-4-10-1	13-7-13-4	17-4-16-5	21-1-19-6	10-4-9-11	13-7-12-7	16-4-14-8	19-6-17-5
	Southern pine	#2	10-1-9-6	13-4-12-1	16-5-14-4	19-3-16-10	9-6-8-6	12-4-10-10	14-8-12-10	17-2-15-1
	Southern pine	#3	8-3-7-3	10-6-9-1	12-5-11-0	14-9-13-1	7-4-6-5	9-5-8-2	11-1-9-10	13-2-11-8
	Spruce-pine-fir	SS	9-10	13-0	16-7	20-2	9-10	13-0	16-7	19-6
	Spruce-pine-fir	#1	9-8	12-9	15-8	18-3	9-1	11-6	14-1	16-3
Spruce-pine-fir	#2	9-8	12-9	15-8	18-3	9-1	11-6	14-1	16-3	
Spruce-pine-fir	#3	7-8	9-9	11-10	13-9	6-10	8-8	10-7	12-4	
24	Douglas fir-larch	SS	9-11	13-1	16-8	20-3	9-11	13-1	16-2	18-9
	Douglas fir-larch	#1	9-7	12-4	15-0	17-5	8-8	11-0	13-5	15-7
	Douglas fir-larch	#2	9-1	11-6	14-1	16-3	8-1	10-3	12-7	14-7
	Douglas fir-larch	#3	6-10	8-8	10-7	12-4	6-2	7-9	9-6	11-0
	Hem-fir	SS	9-4	12-4	15-9	19-2	9-4	12-4	15-9	18-5
	Hem-fir	#1	9-2	12-0	14-8	17-0	8-6	10-9	13-1	15-2
	Hem-fir	#2	8-9	11-4	13-10	16-1	8-0	10-2	12-5	14-4
	Hem-fir	#3	6-10	8-8	10-7	12-4	6-2	7-9	9-6	11-0
	Southern pine	SS	9-9	12-10	16-5	19-11	9-9	12-10	16-5	19-11-19-8
	Southern pine	#1	9-7-9-4	12-7-12-4	16-1-14-8	19-6-17-5	9-7-8-10	12-4-11-3	14-7-13-1	17-5-15-7
	Southern pine	#2	9-4-8-6	12-4-10-10	14-8-12-10	17-2-15-1	8-6-7-7	11-0-9-8	13-1-11-5	15-5-13-6
	Southern pine	#3	7-4-6-5	9-5-8-2	11-1-9-10	13-2-11-8	6-7-5-9	8-5-7-3	9-11-8-10	11-10-10-5
	Spruce-pine-fir	SS	9-2	12-1	15-5	18-9	9-2	12-1	15-0	17-5
	Spruce-pine-fir	#1	8-11	11-6	14-1	16-3	8-1	10-3	12-7	14-7
Spruce-pine-fir	#2	8-11	11-6	14-1	16-3	8-1	10-3	12-7	14-7	
Spruce-pine-fir	#3	6-10	8-8	10-7	12-4	6-2	7-9	9-6	11-0	

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

Note: Check sources for availability of lumber in lengths greater than 20 feet.

- a. Dead load limits for townhouses in Seismic Design Category C and all structures in Seismic Design Categories D₀, D₁ and D₂ shall be determined in accordance with Section R301.2.2.2.1.

TABLE R502.3.1(2)
FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES
 (Residential living areas, live load = 40 psf, L/Δ = 360)^b

JOIST SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf				DEAD LOAD = 20 psf			
			2 × 6	2 × 8	2 × 10	2 × 12	2 × 6	2 × 8	2 × 10	2 × 12
			Maximum floor joist spans							
			(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)
12	Douglas fir-larch	SS	11-4	15-0	19-1	23-3	11-4	15-0	19-1	23-3
	Douglas fir-larch	#1	10-11	14-5	18-5	22-0	10-11	14-2	17-4	20-1
	Douglas fir-larch	#2	10-9	14-2	17-9	20-7	10-6	13-3	16-3	18-10
	Douglas fir-larch	#3	8-8	11-0	13-5	15-7	7-11	10-0	12-3	14-3
	Hem-fir	SS	10-9	14-2	18-0	21-11	10-9	14-2	18-0	21-11
	Hem-fir	#1	10-6	13-10	17-8	21-6	10-6	13-10	16-11	19-7
	Hem-fir	#2	10-0	13-2	16-10	20-4	10-0	13-1	16-0	18-6
	Hem-fir	#3	8-8	11-0	13-5	15-7	7-11	10-0	12-3	14-3
	Southern pine	SS	11-2	14-8	18-9	22-10	11-2	14-8	18-9	22-10
	Southern pine	#1	10-11-10-9	14-5-14-2	18-5-18-0	22-5-21-11	10-11-10-9	14-5-14-2	18-5-16-11	22-5-20-1
	Southern pine	#2	10-9-10-3	14-2-13-6	18-0-16-2	21-9-19-1	10-9-9-10	14-2-12-6	16-11-14-9	19-10-17-5
	Southern pine	#3	9-4-8-2	11-11-10-3	14-0-12-6	16-8-14-9	8-6-7-5	10-10-9-5	12-10-11-5	15-3-13-6
	Spruce-pine-fir	SS	10-6	13-10	17-8	21-6	10-6	13-10	17-8	21-6
	Spruce-pine-fir	#1	10-3	13-6	17-3	20-7	10-3	13-3	16-3	18-10
	Spruce-pine-fir	#2	10-3	13-6	17-3	20-7	10-3	13-3	16-3	18-10
	Spruce-pine-fir	#3	8-8	11-0	13-5	15-7	7-11	10-0	12-3	14-3
16	Douglas fir-larch	SS	10-4	13-7	17-4	21-1	10-4	13-7	17-4	21-0
	Douglas fir-larch	#1	9-11	13-1	16-5	19-1	9-8	12-4	15-0	17-5
	Douglas fir-larch	#2	9-9	12-7	15-5	17-10	9-1	11-6	14-1	16-3
	Douglas fir-larch	#3	7-6	9-6	11-8	13-6	6-10	8-8	10-7	12-4
	Hem-fir	SS	9-9	12-10	16-5	19-11	9-9	12-10	16-5	19-11
	Hem-fir	#1	9-6	12-7	16-0	18-7	9-6	12-0	14-8	17-0
	Hem-fir	#2	9-1	12-0	15-2	17-7	8-11	11-4	13-10	16-1
	Hem-fir	#3	7-6	9-6	11-8	13-6	6-10	8-8	10-7	12-4
	Southern pine	SS	10-2	13-4	17-0	20-9	10-2	13-4	17-0	20-9
	Southern pine	#1	9-11-9-9	13-1-12-10	16-9-16-1	20-4-19-1	9-11-9-9	13-1-12-7	16-4-14-8	19-6-17-5
	Southern pine	#2	9-9-9-4	12-10-11-10	16-1-14-0	18-10-16-6	9-6-8-6	12-4-10-10	14-8-12-10	17-2-15-1
	Southern pine	#3	8-1-7-1	10-3-8-11	12-2-10-10	14-6-12-10	7-4-6-5	9-5-8-2	11-1-9-10	13-2-11-8
	Spruce-pine-fir	SS	9-6	12-7	16-0	19-6	9-6	12-7	16-0	19-6
	Spruce-pine-fir	#1	9-4	12-3	15-5	17-10	9-1	11-6	14-1	16-3
	Spruce-pine-fir	#2	9-4	12-3	15-5	17-10	9-1	11-6	14-1	16-3
	Spruce-pine-fir	#3	7-6	9-6	11-8	13-6	6-10	8-8	10-7	12-4

(continued)

TABLE R502.3.1(2)—continued
FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES
 (Residential living areas, live load = 40 psf, $L/\Delta = 360$)^b

JOIST SPACING (Inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf				DEAD LOAD = 20 psf			
			2 × 6	2 × 8	2 × 10	2 × 12	2 × 6	2 × 8	2 × 10	2 × 12
			Maximum floor joist spans							
		(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	(ft - in.)	
19.2	Douglas fir-larch	SS	9-8	12-10	16-4	19-10	9-8	12-10	16-4	19-2
	Douglas fir-larch	#1	9-4	12-4	15-0	17-5	8-10	11-3	13-8	15-11
	Douglas fir-larch	#2	9-1	11-6	14-1	16-3	8-3	10-6	12-10	14-10
	Douglas fir-larch	#3	6-10	8-8	10-7	12-4	6-3	7-11	9-8	11-3
	Hem-fir	SS	9-2	12-1	15-5	18-9	9-2	12-1	15-5	18-9
	Hem-fir	#1	9-0	11-10	14-8	17-0	8-8	10-11	13-4	15-6
	Hem-fir	#2	8-7	11-3	13-10	16-1	8-2	10-4	12-8	14-8
	Hem-fir	#3	6-10	8-8	10-7	12-4	6-3	7-11	9-8	11-3
	Southern pine	SS	9-6	12-7	16-0	19-6	9-6	12-7	16-0	19-6
	Southern pine	#1	9-4-9-2	12-4-12-1	15-9-14-8	19-2-17-5	9-4-9-0	12-4-11-5	14-11-13-5	17-9-15-11
	Southern pine	#2	9-2-8-6	12-1-10-10	14-8-12-10	17-2-15-1	8-8-7-9	11-3-9-10	13-5-11-8	15-8-13-9
	Southern pine	#3	7-4-6-5	9-5-8-2	11-1-9-10	13-2-11-8	6-9-5-11	8-7-7-5	10-1-9-0	12-1-10-8
	Spruce-pine-fir	SS	9-0	11-10	15-1	18-4	9-0	11-10	15-1	17-9
	Spruce-pine-fir	#	8-9	11-6	14-1	16-3	8-3	10-6	12-10	14-10
	Spruce-pine-fir	#2	8-9	11-6	14-1	16-3	8-3	10-6	12-10	14-10
	Spruce-pine-fir	#3	6-10	8-8	10-7	12-4	6-3	7-11	9-8	11-3
24	Douglas fir-larch	SS	9-0	11-11	15-2	18-5	9-0	11-11	14-9	17-1
	Douglas fir-larch	#1	8-8	11-0	13-5	15-7	7-11	10-0	12-3	14-3
	Douglas fir-larch	#2	8-1	10-3	12-7	14-7	7-5	9-5	11-6	13-4
	Douglas fir-larch	#3	6-2	7-9	9-6	11-0	5-7	7-1	8-8	10-1
	Hem-fir	SS	8-6	11-3	14-4	17-5	8-6	11-3	14-4	16-10 ^a
	Hem-fir	#1	8-4	10-9	13-1	15-2	7-9	9-9	11-11	13-10
	Hem-fir	#2	7-11	10-2	12-5	14-4	7-4	9-3	11-4	13-1
	Hem-fir	#3	6-2	7-9	9-6	11-0	5-7	7-1	8-8	10-1
	Southern pine	SS	8-10	11-8	14-11	18-1	8-10	11-8	14-11	18-1-18-0
	Southern pine	#1	8-8-8-6	11-5-11-3	14-7-13-1	17-5-15-7	8-8-8-1	11-3-10-3	13-4-12-0	15-11-14-3
	Southern pine	#2	8-6-7-7	11-0-9-8	13-1-11-5	15-5-13-6	7-9-7-0	10-0-8-10	12-0-10-5	14-0-12-4
	Southern pine	#3	6-7-5-9	8-5-7-3	9-11-8-10	11-10-10-5	6-0-5-3	7-8-6-8	9-1-8-1	10-9-9-6
	Spruce-pine-fir	SS	8-4	11-0	14-0	17-0	8-4	11-0	13-8	15-11
	Spruce-pine-fir	#1	8-1	10-3	12-7	14-7	7-5	9-5	11-6	13-4
	Spruce-pine-fir	#2	8-1	10-3	12-7	14-7	7-5	9-5	11-6	13-4
	Spruce-pine-fir	#3	6-2	7-9	9-6	11-0	5-7	7-1	8-8	10-1

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

Note: Check sources for availability of lumber in lengths greater than 20 feet.

a. End bearing length shall be increased to 2 inches.

b. Dead load limits for townhouses in Seismic Design Category C and all structures in Seismic Design Categories D₀, D₁, and D₂ shall be determined in accordance with Section R301.2.2.2.1.

TABLE R502.3.3(1)
CANTILEVER SPANS FOR FLOOR JOISTS SUPPORTING LIGHT-FRAME EXTERIOR BEARING WALL AND ROOF ONLY^{a, b, c, f, g, h}
(Floor Live Load ≤ 40 psf, Roof Live Load ≤ 20 psf)

Member & Spacing	Maximum Cantilever Span (Uplift Force at Backspan Support in Lbs.) ^{d, e}											
	Ground Snow Load											
	≤ 20 psf			30 psf			50 psf			70 psf		
	Roof Width			Roof Width			Roof Width			Roof Width		
	24 ft	32 ft	40 ft	24 ft	32 ft	40 ft	24 ft	32 ft	40 ft	24 ft	32 ft	40 ft
2 × 8 @ 12"	20" (177)	15" (227)	—	18" (209)	—	—	—	—	—	—	—	—
2 × 10 @ 16"	29" (228)	21" (297)	16" (364)	26" (271)	18" (354)	—	20" (375)	—	—	—	—	—
2 × 10 @ 12"	36" (166)	26" (219)	20" (270)	34" (198)	22" (263)	16" (324)	26" (277)	—	—	19" (356)	—	—
2 × 12 @ 16"	—	32" (287)	25" (356)	36" (263)	29" (345)	21" (428)	29" (367)	20" (484)	—	23" (471)	—	—
2 × 12 @ 12"	—	42" (209)	31" (263)	—	37" (253)	27" (317)	36" (271)	27" (358)	17" (447)	31" (348)	19" (462)	—
2 × 12 @ 8"	—	48" (136)	45" (169)	—	48" (164)	38" (206)	—	40" (233)	26" (294)	36" (230)	29" (304)	18" (379)

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

- a. Tabulated values are for clear-span roof supported solely by exterior bearing walls.
- b. Spans are based on minimum design properties for No. 2 Grade lumber of Douglas fir-larch, hem-fir, southern-pine and spruce-pine-fir for repetitive (three or more) members. No. 1 or better grade lumber shall be used for southern pine.
- c. Ratio of backspan to cantilever span shall be at least 3:1.
- d. Connections capable of resisting the indicated uplift force shall be provided at the backspan support.
- e. Uplift force is for a backspan to cantilever span ratio of 3:1. Tabulated uplift values are permitted to be reduced by multiplying by a factor equal to 3 divided by the actual backspan ratio provided (3/backspan ratio).
- f. See Section R301.2.2.2.5, Item 1, for additional limitations on cantilevered floor joists for detached one- and two-family dwellings in Seismic Design Category D₀, D₁, or D₂ and townhouses in Seismic Design Category C, D₀, D₁ or D₂.
- g. A full-depth rim joist shall be provided at the unsupported end of the cantilever joists. Solid blocking shall be provided at the supported end.
- h. Linear interpolation shall be permitted for building widths and ground snow loads other than shown.

TABLE R502.3.3(2)
CANTILEVER SPANS FOR FLOOR JOISTS SUPPORTING EXTERIOR BALCONY^{a, b, e, f}

Member Size	Spacing	Maximum Cantilever Span (Uplift Force at Backspan Support in lb) ^{c, d}		
		Ground Snow Load		
		≤ 30 psf	50 psf	70 psf
2 × 8	12"	42" (139)	39" (156)	34" (165)
2 × 8	16"	36" (151)	34" (171)	29" (180)
2 × 10	12"	61" (164)	57" (189)	49" (201)
2 × 10	16"	53" (180)	49" (208)	42" (220)
2 × 10	24"	43" (212)	40" (241)	34" (255)
2 × 12	16"	72" (228)	67" (260)	57" (268)
2 × 12	24"	58" (279)	54" (319)	47" (330)

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa.

- a. Spans are based on minimum design properties for No. 2 Grade lumber of Douglas fir-larch, hem-fir, southern-pine and spruce-pine-fir for repetitive (three or more) members. No. 1 or better grade lumber shall be used for southern pine.
- b. Ratio of backspan to cantilever span shall be at least 2:1.
- c. Connections capable of resisting the indicated uplift force shall be provided at the backspan support.
- d. Uplift force is for a backspan to cantilever span ratio of 2:1. Tabulated uplift values are permitted to be reduced by multiplying by a factor equal to 2 divided by the actual backspan ratio provided (2/backspan ratio).
- e. A full-depth rim joist shall be provided at the unsupported end of the cantilever joists. Solid blocking shall be provided at the supported end.
- f. Linear interpolation shall be permitted for ground snow loads other than shown.

TABLE R502.5(1)
GIRDER SPANS^{a,b} AND HEADER SPANS^{a,b} FOR EXTERIOR BEARING WALLS
 (Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir^b and required number of jack studs)

GIRDERS AND HEADERS SUPPORTING	SIZE	GROUND SNOW LOAD (psf) ^e																	
		30						50						70					
		Building width ^c (feet)																	
		20		28		36		20		28		36		20		28		36	
Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d		
Roof and ceiling	2-2 x 4	3-6	1	3-2	1	2-10	1	3-2	1	2-9	1	2-6	1	2-10	1	2-6	1	2-3	1
	2-2 x 6	5-5	1	4-8	1	4-2	1	4-8	1	4-1	1	3-8	2	4-2	1	3-8	2	3-3	2
	2-2 x 8	6-10	1	5-11	2	5-4	2	5-11	2	5-2	2	4-7	2	5-4	2	4-7	2	4-1	2
	2-2 x 10	8-5	2	7-3	2	6-6	2	7-3	2	6-3	2	5-7	2	6-6	2	5-7	2	5-0	2
	2-2 x 12	9-9	2	8-5	2	7-6	2	8-5	2	7-3	2	6-6	2	7-6	2	6-6	2	5-10	3
	3-2 x 8	8-4	1	7-5	1	6-8	1	7-5	1	6-5	2	5-9	2	6-8	1	5-9	2	5-2	2
	3-2 x 10	10-6	1	9-1	2	8-2	2	9-1	2	7-10	2	7-0	2	8-2	2	7-0	2	6-4	2
	3-2 x 12	12-2	2	10-7	2	9-5	2	10-7	2	9-2	2	8-2	2	9-5	2	8-2	2	7-4	2
	4-2 x 8	9-2	1	8-4	1	7-8	1	8-4	1	7-5	1	6-8	1	7-8	1	6-8	1	5-11	2
	4-2 x 10	11-8	1	10-6	1	9-5	2	10-6	1	9-1	2	8-2	2	9-5	2	8-2	2	7-3	2
4-2 x 12	14-1	1	12-2	2	10-11	2	12-2	2	10-7	2	9-5	2	10-11	2	9-5	2	8-5	2	
Roof, ceiling and one center-bearing floor	2-2 x 4	3-1	1	2-9	1	2-5	1	2-9	1	2-5	1	2-2	1	2-7	1	2-3	1	2-0	1
	2-2 x 6	4-6	1	4-0	1	3-7	2	4-1	1	3-7	2	3-3	2	3-9	2	3-3	2	2-11	2
	2-2 x 8	5-9	2	5-0	2	4-6	2	5-2	2	4-6	2	4-1	2	4-9	2	4-2	2	3-9	2
	2-2 x 10	7-0	2	6-2	2	5-6	2	6-4	2	5-6	2	5-0	2	5-9	2	5-1	2	4-7	3
	2-2 x 12	8-1	2	7-1	2	6-5	2	7-4	2	6-5	2	5-9	3	6-8	2	5-10	3	5-3	3
	3-2 x 8	7-2	1	6-3	2	5-8	2	6-5	2	5-8	2	5-1	2	5-11	2	5-2	2	4-8	2
	3-2 x 10	8-9	2	7-8	2	6-11	2	7-11	2	6-11	2	6-3	2	7-3	2	6-4	2	5-8	2
	3-2 x 12	10-2	2	8-11	2	8-0	2	9-2	2	8-0	2	7-3	2	8-5	2	7-4	2	6-7	2
	4-2 x 8	8-1	1	7-3	1	6-7	1	7-5	1	6-6	1	5-11	2	6-10	1	6-0	2	5-5	2
	4-2 x 10	10-1	1	8-10	2	8-0	2	9-1	2	8-0	2	7-2	2	8-4	2	7-4	2	6-7	2
4-2 x 12	11-9	2	10-3	2	9-3	2	10-7	2	9-3	2	8-4	2	9-8	2	8-6	2	7-7	2	
Roof, ceiling and one clear span floor	2-2 x 4	2-8	1	2-4	1	2-1	1	2-7	1	2-3	1	2-0	1	2-5	1	2-1	1	1-10	1
	2-2 x 6	3-11	1	3-5	2	3-0	2	3-10	2	3-4	2	3-0	2	3-6	2	3-1	2	2-9	2
	2-2 x 8	5-0	2	4-4	2	3-10	2	4-10	2	4-2	2	3-9	2	4-6	2	3-11	2	3-6	2
	2-2 x 10	6-1	2	5-3	2	4-8	2	5-11	2	5-1	2	4-7	3	5-6	2	4-9	2	4-3	3
	2-2 x 12	7-1	2	6-1	3	5-5	3	6-10	2	5-11	3	5-4	3	6-4	2	5-6	3	5-0	3
	3-2 x 8	6-3	2	5-5	2	4-10	2	6-1	2	5-3	2	4-8	2	5-7	2	4-11	2	4-5	2
	3-2 x 10	7-7	2	6-7	2	5-11	2	7-5	2	6-5	2	5-9	2	6-10	2	6-0	2	5-4	2
	3-2 x 12	8-10	2	7-8	2	6-10	2	8-7	2	7-5	2	6-8	2	7-11	2	6-11	2	6-3	2
	4-2 x 8	7-2	1	6-3	2	5-7	2	7-0	1	6-1	2	5-5	2	6-6	1	5-8	2	5-1	2
	4-2 x 10	8-9	2	7-7	2	6-10	2	8-7	2	7-5	2	6-7	2	7-11	2	6-11	2	6-2	2
4-2 x 12	10-2	2	8-10	2	7-11	2	9-11	2	8-7	2	7-8	2	9-2	2	8-0	2	7-2	2	
Roof, ceiling and two center-bearing floors	2-2 x 4	2-7	1	2-3	1	2-0	1	2-6	1	2-2	1	1-11	1	2-4	1	2-0	1	1-9	1
	2-2 x 6	3-9	2	3-3	2	2-11	2	3-8	2	3-2	2	2-10	2	3-5	2	3-0	2	2-8	2
	2-2 x 8	4-9	2	4-2	2	3-9	2	4-7	2	4-0	2	3-8	2	4-4	2	3-9	2	3-5	2
	2-2 x 10	5-9	2	5-1	2	4-7	3	5-8	2	4-11	2	4-5	3	5-3	2	4-7	3	4-2	3
	2-2 x 12	6-8	2	5-10	3	5-3	3	6-6	2	5-9	3	5-2	3	6-1	3	5-4	3	4-10	3
	3-2 x 8	5-11	2	5-2	2	4-8	2	5-9	2	5-1	2	4-7	2	5-5	2	4-9	2	4-3	2
	3-2 x 10	7-3	2	6-4	2	5-8	2	7-1	2	6-2	2	5-7	2	6-7	2	5-9	2	5-3	2
	3-2 x 12	8-5	2	7-4	2	6-7	2	8-2	2	7-2	2	6-5	3	7-8	2	6-9	2	6-1	3
	4-2 x 8	6-10	1	6-0	2	5-5	2	6-8	1	5-10	2	5-3	2	6-3	2	5-6	2	4-11	2
	4-2 x 10	8-4	2	7-4	2	6-7	2	8-2	2	7-2	2	6-5	2	7-7	2	6-8	2	6-0	2
4-2 x 12	9-8	2	8-6	2	7-8	2	9-5	2	8-3	2	7-5	2	8-10	2	7-9	2	7-0	2	
Roof, ceiling, and two clear span floors	2-2 x 4	2-1	1	1-8	1	1-6	2	2-0	1	1-8	1	1-5	2	2-0	1	1-8	1	1-5	2
	2-2 x 6	3-1	2	2-8	2	2-4	2	3-0	2	2-7	2	2-3	2	2-11	2	2-7	2	2-3	2
	2-2 x 8	3-10	2	3-4	2	3-0	3	3-10	2	3-4	2	2-11	3	3-9	2	3-3	2	2-11	3

(continued)

TABLE R502.5(1)—continued
GIRDER SPANS^{a,b} AND HEADER SPANS^{a,b} FOR EXTERIOR BEARING WALLS
(Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir^b and required number of jack studs)

GIRDERS AND HEADERS SUPPORTING	SIZE	GROUND SNOW LOAD (psf) ^a																	
		30						50						70					
		Building width ^c (feet)																	
		20		28		36		20		28		36		20		28		36	
Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d	Span	NJ ^d
Roof, ceiling, and two clear span floors	2-2 × 10	4-9	2	4-1	3	3-8	3	4-8	2	4-0	3	3-7	3	4-7	3	4-0	3	3-6	3
	2-2 × 12	5-6	3	4-9	3	4-3	3	5-5	3	4-8	3	4-2	3	5-4	3	4-7	3	4-1	4
	3-2 × 8	4-10	2	4-2	2	3-9	2	4-9	2	4-1	2	3-8	2	4-8	2	4-1	2	3-8	2
	3-2 × 10	5-11	2	5-1	2	4-7	3	5-10	2	5-0	2	4-6	3	5-9	2	4-11	2	4-5	3
	3-2 × 12	6-10	2	5-11	3	5-4	3	6-9	2	5-10	3	5-3	3	6-8	2	5-9	3	5-2	3
	4-2 × 8	5-7	2	4-10	2	4-4	2	5-6	2	4-9	2	4-3	2	5-5	2	4-8	2	4-2	2
	4-2 × 10	6-10	2	5-11	2	5-3	2	6-9	2	5-10	2	5-2	2	6-7	2	5-9	2	5-1	2
	4-2 × 12	7-11	2	6-10	2	6-2	3	7-9	2	6-9	2	6-0	3	7-8	2	6-8	2	5-11	3

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa.

- Spans are given in feet and inches.
- ~~Fabulated values assume #2 grade lumber.~~ Spans are based on minimum design properties for No. 2 Grade lumber of Douglas fir-larch, hem-fir, and spruce-pine-fir. No. 1 or better grade lumber shall be used for southern pine.
- Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.
- NJ - Number of jack studs required to support each end. Where the number of required jack studs equals one, the header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.
- Use 30 psf ground snow load for cases in which ground snow load is less than 30 psf and the roof live load is equal to or less than 20 psf.

TABLE R502.5(2)
GIRDER SPANS^{a,b} AND HEADER SPANS^{a,b} FOR INTERIOR BEARING WALLS
 (Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir^b and required number of jack studs)

HEADERS AND GIRDERS SUPPORTING	SIZE	BUILDING Width ^c (feet)					
		20		28		36	
		Span	NJ ^d	Span	NJ ^d	Span	NJ ^d
One floor only	2-2 × 4	3-1	1	2-8	1	2-5	1
	2-2 × 6	4-6	1	3-11	1	3-6	1
	2-2 × 8	5-9	1	5-0	2	4-5	2
	2-2 × 10	7-0	2	6-1	2	5-5	2
	2-2 × 12	8-1	2	7-0	2	6-3	2
	3-2 × 8	7-2	1	6-3	1	5-7	2
	3-2 × 10	8-9	1	7-7	2	6-9	2
	3-2 × 12	10-2	2	8-10	2	7-10	2
	4-2 × 8	9-0	1	7-8	1	6-9	1
	4-2 × 10	10-1	1	8-9	1	7-10	2
Two floors	2-2 × 4	2-2	1	1-10	1	1-7	1
	2-2 × 6	3-2	2	2-9	2	2-5	2
	2-2 × 8	4-1	2	3-6	2	3-2	2
	2-2 × 10	4-11	2	4-3	2	3-10	3
	2-2 × 12	5-9	2	5-0	3	4-5	3
	3-2 × 8	5-1	2	4-5	2	3-11	2
	3-2 × 10	6-2	2	5-4	2	4-10	2
	3-2 × 12	7-2	2	6-3	2	5-7	3
	4-2 × 8	6-1	1	5-3	2	4-8	2
	4-2 × 10	7-2	2	6-2	2	5-6	2
4-2 × 12	8-4	2	7-2	2	6-5	2	

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. Spans are given in feet and inches.

b. Tabulated values assume #2 grade lumber. Spans are based on minimum design properties for No. 2 Grade lumber of Douglas fir-larch, hem-fir, and spruce-pine-fir. No. 1 or better grade lumber shall be used for southern pine.

c. Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.

d. NJ - Number of jack studs required to support each end. Where the number of required jack studs equals one, the header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.

TABLE R602.7.1
SPANS FOR MINIMUM No.2 GRADE SINGLE HEADER^{a, b, c, f}

SINGLE HEADERS SUPPORTING	SIZE	WOOD SPECIES	GROUND SNOW LOAD (psf)								
			≤ 20 ^d			30			50		
			Building Width (feet) ^e								
			20	28	36	20	28	36	20	28	36
Roof and ceiling	2 × 8	Spruce-Pine-Fir	4-10	4-2	3-8	4-3	3-8	3-3	3-7	3-0	2-8
		Hem-Fir	5-1	4-4	3-10	4-6	3-10	3-5	3-9	3-2	2-10
		Douglas-Fir or <u>No. 1 Grade Southern Pine</u>	5-3	4-6	4-0	4-7	3-11	3-6	3-10	3-3	2-11
Roof and ceiling	2 × 10	Spruce-Pine-Fir	6-2	5-3	4-8	5-5	4-8	4-2	4-6	3-11	3-1
		Hem-Fir	6-6	5-6	4-11	5-8	4-11	4-4	4-9	4-1	3-7
		Douglas-Fir or <u>No. 1 Grade Southern Pine</u>	6-8	5-8	5-1	5-10	5-0	4-6	4-11	4-2	3-9
Roof and ceiling	2 × 12	Spruce-Pine-Fir	7-6	6-5	5-9	6-7	5-8	4-5	5-4	3-11	3-1
		Hem-Fir	7-10	6-9	6-0	6-11	5-11	5-3	5-9	4-8	3-8
		Douglas-Fir or <u>No. 1 Grade Southern Pine</u>	8-1	6-11	6-2	7-2	6-1	5-5	5-11	5-1	4-6
Roof, ceiling and one center-bearing floor	2 × 8	Spruce-Pine-Fir	3-10	3-3	2-11	3-9	3-3	2-11	3-5	2-11	2-7
		Hem-Fir	4-0	3-5	3-1	3-11	3-5	3-0	3-7	3-0	2-8
		Douglas-Fir or <u>No. 1 Grade Southern Pine</u>	4-1	3-7	3-2	4-1	3-6	3-1	3-8	3-2	2-9
Roof, ceiling and one center-bearing floor	2 × 10	Spruce-Pine-Fir	4-11	4-2	3-8	4-10	4-1	3-6	4-4	3-7	2-10
		Hem-Fir	5-1	4-5	3-11	5-0	4-4	3-10	4-6	3-11	3-4
		Douglas-Fir or <u>No. 1 Grade Southern Pine</u>	5-3	4-6	4-1	5-2	4-5	4-0	4-8	4-0	3-7
Roof, ceiling and one center-bearing floor	2 × 12	Spruce-Pine-Fir	5-8	4-2	3-4	5-5	4-0	3-6	4-9	3-6	2-10
		Hem-Fir	5-11	4-11	3-11	5-10	4-9	4-2	5-5	4-2	3-4
		Douglas-Fir or <u>No. 1 Grade Southern Pine</u>	6-1	5-3	4-8	6-0	5-2	4-10	5-7	4-10	4-3
Roof, ceiling and one clear span floor	2 × 8	Spruce-Pine-Fir	3-5	2-11	2-7	3-4	2-11	2-7	3-3	2-10	2-6
		Hem-Fir	3-7	3-1	2-9	3-6	3-0	2-8	3-5	2-11	2-7
		Douglas-Fir or <u>No. 1 Grade Southern Pine</u>	3-8	3-2	2-10	3-7	3-1	2-9	3-6	3-0	2-9
Roof, ceiling and one clear span floor	2 × 10	Spruce-Pine-Fir	4-4	3-7	2-10	4-3	3-6	2-9	4-2	3-4	2-7
		Hem-Fir	4-7	3-11	3-5	4-6	3-10	3-3	4-4	3-9	3-1
		Douglas-Fir or <u>No. 1 Grade Southern Pine</u>	4-8	4-0	3-7	4-7	4-0	3-6	4-6	3-10	3-5
Roof, ceiling and one clear span floor	2 × 12	Spruce-Pine-Fir	4-11	3-7	2-10	4-9	3-6	2-9	4-6	3-4	2-7
		Hem-Fir	5-6	4-3	3-5	5-6	4-2	3-3	5-4	3-11	3-1
		Douglas-Fir or <u>No. 1 Grade Southern Pine</u>	5-8	4-11	4-4	5-7	4-10	4-3	5-6	4-8	4-2

For SI: 1 inch=25.4 mm, 1 pound per square foot = 0.0479 kPa.

- Spans are given in feet and inches.
- Table is based on a maximum roof-ceiling dead load of 15 psf.
- The header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header in lieu of the required jack stud.
- The 20 psf ground snow load condition shall apply only when the roof pitch is 9:12 or greater. In conditions where the ground snow load is 30 psf or less and the roof pitch is less than 9:12, use the 30 psf ground snow load condition.
- Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.
- The header shall bear on a minimum of one jack stud at each end.

TABLE R802.4(1)
CEILING JOIST SPANS FOR COMMON LUMBER SPECIES
(Uninhabitable attics without storage, live load = 10 psf, L/Δ = 240)

CEILING JOIST SPACING (Inches)	SPECIES AND GRADE	DEAD LOAD = 5 psf			
		2 × 4	2 × 6	2 × 8	2 × 10
		Maximum ceiling joist spans			
		(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
12	Douglas fir-larch SS	13-2	20-8	Note a	Note a
	Douglas fir-larch #1	12-8	19-11	Note a	Note a
	Douglas fir-larch #2	12-5	19-6	25-8	Note a
	Douglas fir-larch #3	10-10	15-10	20-1	24-6
	Hem-fir SS	12-5	19-6	25-8	Note a
	Hem-fir #1	12-2	19-1	25-2	Note a
	Hem-fir #2	11-7	18-2	24-0	Note a
	Hem-fir #3	10-10	15-10	20-1	24-6
	Southern pine SS	12-11	20-3	Note a	Note a
	Southern pine #1	12-8 <u>12-5</u>	19-11 <u>19-6</u>	Note a <u>25-8</u>	Note a
	Southern pine #2	12-5 <u>11-10</u>	19-6 <u>18-8</u>	25-8 <u>24-7</u>	Note a
	Southern pine #3	11-6 <u>10-1</u>	17-0 <u>14-11</u>	21-8 <u>18-9</u>	25-7 <u>22-9</u>
	Spruce-pine-fir SS	12-2	19-1	25-2	Note a
	Spruce-pine-fir #1	11-10	18-8	24-7	Note a
	Spruce-pine-fir #2	11-10	18-8	24-7	Note a
	Spruce-pine-fir #3	10-10	15-10	20-1	24-6
16	Douglas fir-larch SS	11-11	18-9	24-8	Note a
	Douglas fir-larch #1	11-6	18-1	23-10	Note a
	Douglas fir-larch #2	11-3	17-8	23-0	Note a
	Douglas fir-larch #3	9-5	13-9	17-5	21-3
	Hem-fir SS	11-3	17-8	23-4	Note a
	Hem-fir #1	11-0	17-4	22-10	Note a
	Hem-fir #2	10-6	16-6	21-9	Note a
	Hem-fir #3	9-5	13-9	17-5	21-3
	Southern pine SS	11-9	18-5	24-3	Note a
	Southern pine #1	11-6 <u>11-3</u>	18-1 <u>17-8</u>	23-10 <u>23-4</u>	Note a
	Southern pine #2	11-3 <u>10-9</u>	17-8 <u>16-11</u>	23-4 <u>21-7</u>	Note a <u>25-7</u>
	Southern pine #3	10-0 <u>8-9</u>	14-9 <u>12-11</u>	18-9 <u>16-3</u>	22-2 <u>19-9</u>
	Spruce-pine-fir SS	11-0	17-4	22-10	Note a
	Spruce-pine-fir #1	10-9	16-11	22-4	Note a
	Spruce-pine-fir #2	10-9	16-11	22-4	Note a
	Spruce-pine-fir #3	9-5	13-9	17-5	21-3

(continued)

TABLE R802.4(1)—continued
CEILING JOIST SPANS FOR COMMON LUMBER SPECIES
(Uninhabitable attics without storage, live load = 10 psf, L/Δ = 240)

CEILING JOIST SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 5 psf			
			2 × 4	2 × 6	2 × 8	2 × 10
			Maximum ceiling joist spans			
			(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
19.2	Douglas fir-larch	SS	11-3	17-8	23-3	Note a
	Douglas fir-larch	#1	10-10	17-0	22-5	Note a
	Douglas fir-larch	#2	10-7	16-7	21-0	25-8
	Douglas fir-larch	#3	8-7	12-6	15-10	19-5
	Hem-fir	SS	10-7	16-8	21-11	Note a
	Hem-fir	#1	10-4	16-4	21-6	Note a
	Hem-fir	#2	9-11	15-7	20-6	25-3
	Hem-fir	#3	8-7	12-6	15-10	19-5
	Southern -pine	SS	11-0	17-4	22-10	Note a
	Southern pine	#1	10-10 10-7	17-0 16-8	22-5 22-0	Note a
	Southern pine	#2	10-7 10-2	16-8 15-7	21-11 19-8	Note a 23-5
	Southern pine	#3	9-1 8-0	13-6 11-9	17-2 14-10	20-3 18-0
	Spruce-pine-fir	SS	10-4	16-4	21-6	Note a
	Spruce-pine-fir	#1	10-2	15-11	21-0	25-8
	Spruce-pine-fir	#2	10-2	15-11	21-0	25-8
	Spruce-pine-fir	#3	8-7	12-6	15-10	19-5
24	Douglas fir-larch	SS	10-5	16-4	21-7	Note a
	Douglas fir-larch	#1	10-0	15-9	20-1	24-6
	Douglas fir-larch	#2	9-10	14-10	18-9	22-11
	Douglas fir-larch	#3	7-8	11-2	14-2	17-4
	Hem-fir	SS	9-10	15-6	20-5	Note a
	Hem-fir	#1	9-8	15-2	19-7	23-11
	Hem-fir	#2	9-2	14-5	18-6	22-7
	Hem-fir	#3	7-8	11-2	14-2	17-4
	Southern pine	SS	10-3	16-1	21-2	Note a
	Southern pine	#1	10-0 9-10	15-9 15-6	20-10 20-5	Note a 24-0
	Southern pine	#2	9-10 9-3	15-6 13-11	20-1 17-7	23-11 20-11
	Southern pine	#3	8-2 7-2	12-0 10-6	15-4 13-3	18-1 16-1
	Spruce-pine-fir	SS	9-8	15-2	19-11	25-5
	Spruce-pine-fir	#1	9-5	14-9	18-9	22-11
	Spruce-pine-fir	#2	9-5	14-9	18-9	22-11
	Spruce-pine-fir	#3	7-8	11-2	14-2	17-4

Check sources for availability of lumber in lengths greater than 20 feet.

Conversion: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479kPa.

Span exceeds 26 feet in length.

TABLE R802.4(2)
CEILING JOIST SPANS FOR COMMON LUMBER SPECIES
(Uninhabitable attics with limited storage, live load = 20 psf, L/Δ = 240)

CEILING JOIST SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf			
			2 × 4	2 × 6	2 × 8	2 × 10
			Maximum ceiling joist spans			
			(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
12	Douglas fir-larch	SS	10-5	16-4	21-7	Note a
	Douglas fir-larch	#1	10-0	15-9	20-1	24-6
	Douglas fir-larch	#2	9-10	14-10	18-9	22-11
	Douglas fir-larch	#3	7-8	11-2	14-2	17-4
	Hem-fir	SS	9-10	15-6	20-5	Note a
	Hem-fir	#1	9-8	15-2	19-7	23-11
	Hem-fir	#2	9-2	14-5	18-6	22-7
	Hem-fir	#3	7-8	11-2	14-2	17-4
	Southern pine	SS	10-3	16-1	21-2	Note a
	Southern pine	#1	10-0 <u>9-10</u>	15-9 <u>15-6</u>	20-10 <u>20-5</u>	Note a <u>24-0</u>
	Southern pine	#2	9-10 <u>9-3</u>	15-6 <u>13-11</u>	20-1 <u>17-7</u>	23-11 <u>20-11</u>
	Southern pine	#3	8-2 <u>7-2</u>	12-0 <u>10-6</u>	15-4 <u>13-3</u>	18-1 <u>16-1</u>
	Spruce-pine-fir	SS	9-8	15-2	19-11	25-5
	Spruce-pine-fir	#1	9-5	14-9	18-9	22-11
	Spruce-pine-fir	#2	9-5	14-9	18-9	22-11
	Spruce-pine-fir	#3	7-8	11-2	14-2	17-4
16	Douglas fir-larch	SS	9-6	14-11	19-7	25-0
	Douglas fir-larch	#1	9-1	13-9	17-5	21-3
	Douglas fir-larch	#2	8-9	12-10	16-3	19-10
	Douglas fir-larch	#3	6-8	9-8	12-4	15-0
	Hem-fir	SS	8-11	14-1	18-6	23-8
	Hem-fir	#1	8-9	13-5	16-10	20-8
	Hem-fir	#2	8-4	12-8	16-0	19-7
	Hem-fir	#3	6-8	9-8	12-4	15-0
	Southern pine	SS	9-4	14-7	19-3	24-7
	Southern pine	#1	9-1 <u>8-11</u>	14-4 <u>14-0</u>	18-11 <u>17-9</u>	23-1 <u>20-9</u>
	Southern pine	#2	8-11 <u>8-0</u>	13-6 <u>12-0</u>	17-5 <u>15-3</u>	20-9 <u>18-1</u>
	Southern pine	#3	7-1 <u>6-2</u>	10-5 <u>9-2</u>	13-3 <u>11-6</u>	15-8 <u>14-0</u>
	Spruce-pine-fir	SS	8-9	13-9	18-1	23-1
	Spruce-pine-fir	#1	8-7	12-10	16-3	19-10
	Spruce-pine-fir	#2	8-7	12-10	16-3	19-10
	Spruce-pine-fir	#3	6-8	9-8	12-4	15-0

(continued)

TABLE R802.4(2)—continued
CEILING JOIST SPANS FOR COMMON LUMBER SPECIES
(Uninhabitable attics with limited storage, live load = 20 psf, L/Δ = 240)

CEILING JOIST SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf			
			2 × 4	2 × 6	2 × 8	2 × 10
			Maximum ceiling joist spans			
			(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
19.2	Douglas fir-larch	SS	8-11	14-0	18-5	23-4
	Douglas fir-larch	#1	8-7	12-6	15-10	19-5
	Douglas fir-larch	#2	8-0	11-9	14-10	18-2
	Douglas fir-larch	#3	6-1	8-10	11-3	13-8
	Hem-fir	SS	8-5	13-3	17-5	22-3
	Hem-fir	#1	8-3	12-3	15-6	18-11
	Hem-fir	#2	7-10	11-7	14-8	17-10
	Hem-fir	#3	6-1	8-10	11-3	13-8
	Southern pine	SS	8-9	13-9	18-1 18-2	23-1
	Southern pine	#1	8-7 8-5	13-6 12-9	17-9 16-2	21-1 18-11
	Southern pine	#2	8-5 7-4	12-3 11-0	15-10 13-11	18-11 16-6
	Southern pine	#3	6-5 5-8	9-6 8-4	12-1 10-6	14-4 12-9
	Spruce-pine-fir	SS	8-3	12-11	17-1	21-8
	Spruce-pine-fir	#1	8-0	11-9	14-10	18-2
	Spruce-pine-fir	#2	8-0	11-9	14-10	18-2
	Spruce-pine-fir	#3	6-1	8-10	11-3	13-8
24	Douglas fir-larch	SS	8-3	13-0	17-1	20-11
	Douglas fir-larch	#1	7-8	11-2	14-2	17-4
	Douglas fir-larch	#2	7-2	10-6	13-3	16-3
	Douglas fir-larch	#3	5-5	7-11	10-0	12-3
	Hem-fir	SS	7-10	12-3	16-2	20-6
	Hem-fir	#1	7-6	10-11	13-10	16-11
	Hem-fir	#2	7-1	10-4	13-1	16-0
	Hem-fir	#3	5-5	7-11	10-0	12-3
	Southern pine	SS	8-1	12-9	16-10	21-6
	Southern pine	#1	8-0 7-8	12-6 11-5	15-10 14-6	18-10 16-11
	Southern pine	#2	7-8 6-7	11-0 9-10	14-2 12-6	16-11 14-9
	Southern pine	#3	5-9 5-1	8-6 7-5	10-10 9-5	12-10 11-5
	Spruce-pine-fir	SS	7-8	12-0	15-10	19-5
	Spruce-pine-fir	#1	7-2	10-6	13-3	16-3
	Spruce-pine-fir	#2	7-2	10-6	13-3	16-3
	Spruce-pine-fir	#3	5-5	7-11	10-0	12-3

Check sources for availability of lumber in lengths greater than 20 feet.

SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479kPa.

Span exceeds 26 feet in length.

TABLE R802.5.1(1)
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Roof live load=20 psf, ceiling not attached to rafters, L/Δ = 180)

RAFTER SPACING (inches)	SPECIES AND GRADE	DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
		2 x 4	2 x 6	2 x 8	2 x 10	2 x 12	2 x 4	2 x 6	2 x 8	2 x 10	2 x 12
		Maximum rafter spans ^a									
		(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
12	Douglas fir-larch SS	11-6	18-0	23-9	Note b	Note b	11-6	18-0	23-5	Note b	Note b
	Douglas fir-larch #1	11-1	17-4	22-5	Note b	Note b	10-6	15-4	19-5	23-9	Note b
	Douglas fir-larch #2	10-10	16-7	21-0	25-8	Note b	9-10	14-4	18-2	22-3	25-9
	Douglas fir-larch #3	8-7	12-6	15-10	19-5	22-6	7-5	10-10	13-9	16-9	19-6
	Hem-fir SS	10-10	17-0	22-5	Note b	Note b	10-10	17-0	22-5	Note b	Note b
	Hem-fir #1	10-7	16-8	21-10	Note b	Note b	10-3	14-11	18-11	23-2	Note b
	Hem-fir #2	10-1	15-11	20-8	25-3	Note b	9-8	14-2	17-11	21-11	25-5
	Hem-fir #3	8-7	12-6	15-10	19-5	22-6	7-5	10-10	13-9	16-9	19-6
	Southern pine SS	11-3	17-8	23-4	Note b	Note b	11-3	17-8	23-4	Note b	Note b
	Southern pine #1	11-4-10-10	17-4-17-0	22-11-22-5	Note b	Note b	11-4-10-6	17-3-15-8	21-9-19-10	25-10-23-2	Note b
	Southern pine #2	10-10-10-4	17-0-15-7	22-5-19-8	Note b-23-5	Note b	10-6-9-0	15-1-13-6	19-5-17-1	23-2-20-3	Note b-23-10
	Southern pine #3	9-1-8-0	13-6-11-9	17-2-14-10	20-3-18-0	24-1-21-4	7-11-6-11	11-8-10-2	14-10-12-10	17-6-15-7	20-11-18-6
	Spruce-pine-fir SS	10-7	16-8	21-11	Note b	Note b	10-7	16-8	21-9	Note b	Note b
	Spruce-pine-fir #1	10-4	16-3	21-0	25-8	Note b	9-10	14-4	18-2	22-3	25-9
	Spruce-pine-fir #2	10-4	16-3	21-0	25-8	Note b	9-10	14-4	18-2	22-3	25-9
	Spruce-pine-fir #3	8-7	12-6	15-10	19-5	22-6	7-5	10-10	13-9	16-9	19-6
16	Douglas fir-larch SS	10-5	16-4	21-7	Note b	Note b	10-5	16-0	20-3	24-9	Note b
	Douglas fir-larch #1	10-0	15-4	19-5	23-9	Note b	9-1	13-3	16-10	20-7	23-10
	Douglas fir-larch #2	9-10	14-4	18-2	22-3	25-9	8-6	12-5	15-9	19-3	22-4
	Douglas fir-larch #3	7-5	10-10	13-9	16-9	19-6	6-5	9-5	11-11	14-6	16-10
	Hem-fir SS	9-10	15-6	20-5	Note b	Note b	9-10	15-6	19-11	24-4	Note b
	Hem-fir #1	9-8	14-11	18-11	23-2	Note b	8-10	12-11	16-5	20-0	23-3
	Hem-fir #2	9-2	14-2	17-11	21-11	25-5	8-5	12-3	15-6	18-11	22-0
	Hem-fir #3	7-5	10-10	13-9	16-9	19-6	6-5	9-5	11-11	14-6	16-10
	Southern pine SS	10-3	16-1	21-2	Note b	Note b	10-3	16-1	21-2	Note b-25-7	Note b
	Southern pine #1	10-0-9-10	15-9-15-6	20-10-19-10	25-10-23-2	Note b	10-0-9-1	15-0-13-7	18-10-17-2	22-4-20-1	Note b-23-10
	Southern pine #2	9-10-9-0	15-1-13-6	19-5-17-1	23-2-20-3	Note b-23-10	9-1-7-9	13-0-11-8	16-10-14-9	20-1-17-6	23-7-20-8
	Southern pine #3	7-11-6-11	11-8-10-2	14-10-12-10	17-6-15-7	20-11-18-6	6-10-6-0	10-1-8-10	12-10-11-2	15-2-13-6	18-1-16-0
	Spruce-pine-fir SS	9-8	15-2	19-11	25-5	Note b	9-8	14-10	18-10	23-0	Note b
	Spruce-pine-fir #1	9-5	14-4	18-2	22-3	25-9	8-6	12-5	15-9	19-3	22-4
	Spruce-pine-fir #2	9-5	14-4	18-2	22-3	25-9	8-6	12-5	15-9	19-3	22-4
	Spruce-pine-fir #3	7-5	10-10	13-9	16-9	19-6	6-5	9-5	11-11	14-6	16-10
19.2	Douglas fir-larch SS	9-10	15-5	20-4	25-11	Note b	9-10	14-7	18-6	22-7	Note b
	Douglas fir-larch #1	9-5	14-0	17-9	21-8	25-2	8-4	12-2	15-4	18-9	21-9
	Douglas fir-larch #2	8-11	13-1	16-7	20-3	23-6	7-9	11-4	14-4	17-7	20-4
	Douglas fir-larch #3	6-9	9-11	12-7	15-4	17-9	5-10	8-7	10-10	13-3	15-5
	Hem-fir SS	9-3	14-7	19-2	24-6	Note b	9-3	14-4	18-2	22-3	25-9
	Hem-fir #1	9-1	13-8	17-4	21-1	24-6	8-1	11-10	15-0	18-4	21-3
	Hem-fir #2	8-8	12-11	16-4	20-0	23-2	7-8	11-2	14-2	17-4	20-1
	Hem-fir #3	6-9	9-11	12-7	15-4	17-9	5-10	8-7	10-10	13-3	15-5
	Southern pine SS	9-8	15-2	19-11	25-5	Note b	9-8	15-2	19-11-19-7	25-5-23-4	Note b
	Southern pine #1	9-5-9-3	14-10-14-3	19-7-18-1	23-7-21-2	Note b-25-2	9-3-8-4	13-8-12-4	17-2-15-8	20-5-18-4	24-4-21-9
	Southern pine #2	9-3-8-2	13-9-12-3	17-9-15-7	21-2-18-6	24-10-21-9	8-4-7-1	11-11-10-8	15-4-13-6	18-4-16-0	21-6-18-10
	Southern pine #3	7-3-6-4	10-8-9-4	13-7-11-9	16-0-14-3	19-1-16-10	6-3-5-6	9-3-8-1	11-9-10-2	13-10-12-4	16-6-14-7
	Spruce-pine-fir SS	9-1	14-3	18-9	23-11	Note b	9-1	13-7	17-2	21-0	24-4
	Spruce-pine-fir #1	8-10	13-1	16-7	20-3	23-6	7-9	11-4	14-4	17-7	20-4
	Spruce-pine-fir #2	8-10	13-1	16-7	20-3	23-6	7-9	11-4	14-4	17-7	20-4
	Spruce-pine-fir #3	6-9	9-11	12-7	15-4	17-9	5-10	8-7	10-10	13-3	15-5

(continued)

TABLE R802.5.1(1)—continued
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Roof live load=20 psf, ceiling not attached to rafters, L/Δ = 180)

RAFTER SPACING (inches)	SPECIES AND GRADE	DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
		2 × 4	2 × 6	2 × 8	2 × 10	2 × 12	2 × 4	2 × 6	2 × 8	2 × 10	2 × 12
		Maximum rafter spans ^a									
		(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
24	Douglas fir-larch SS	9-1	14-4	18-10	23-4	Note b	8-11	13-1	16-7	20-3	23-5
	Douglas fir-larch #1	8-7	12-6	15-10	19-5	22-6	7-5	10-10	13-9	16-9	19-6
	Douglas fir-larch #2	8-0	11-9	14-10	18-2	21-0	6-11	10-2	12-10	15-8	18-3
	Douglas fir-larch #3	6-1	8-10	11-3	13-8	15-11	5-3	7-8	9-9	11-10	13-9
	Hem-fir SS	8-7	13-6	17-10	22-9	Note b	8-7	12-10	16-3	19-10	23-0
	Hem-fir #1	8-4	12-3	15-6	18-11	21-11	7-3	10-7	13-5	16-4	19-0
	Hem-fir #2	7-11	11-7	14-8	17-10	20-9	6-10	10-0	12-8	15-6	17-11
	Hem-fir #3	6-1	8-10	11-3	13-8	15-11	5-3	7-8	9-9	11-10	13-9
	Southern pine SS	8-11	14-1	18-6	23-8	Note b	8-11	14-1 13-10	18-6 17-6	22-1 20-10	Note b-24-8
	Southern pine #1	8-9 8-7	13-9 12-9	17-9 16-2	21-1 18-11	25-2 22-6	8-3 7-5	12-3 11-1	15-4 14-0	18-3 16-5	21-9 19-6
	Southern pine #2	8-7 7-4	12-3 11-0	15-10 13-11	18-11 16-6	22-2 19-6	7-5 6-4	10-8 9-6	13-9 12-1	16-5 14-4	19-3 16-10
	Southern pine #3	6-5 5-8	9-6 8-4	12-1 10-6	14-4 12-9	17-1 15-1	5-7 4-11	8-3 7-3	10-6 9-1	12-5 11-0	14-9 13-1
	Spruce-pine-fir SS	8-5	13-3	17-5	21-8	25-2	8-4	12-2	15-4	18-9	21-9
	Spruce-pine-fir #1	8-0	11-9	14-10	18-2	21-0	6-11	10-2	12-10	15-8	18-3
	Spruce-pine-fir #2	8-0	11-9	14-10	18-2	21-0	6-11	10-2	12-10	15-8	18-3
	Spruce-pine-fir #3	6-1	8-10	11-3	13-8	15-11	5-3	7-8	9-9	11-10	13-9

Check sources for availability of lumber in lengths greater than 20 feet.

SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

H_c/H_R	Rafter Span Adjustment Factor
1/3	0.67
1/4	0.76
1/5	0.83
1/6	0.90
1/7.5 or less	1.00

where:

= Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

= Height of roof ridge measured vertically above the top of the rafter support walls.

Span exceeds 26 feet in length.

TABLE R802.5.1(2)
RAFTER SPANS FOR COMMON LUMBER SPECIES
(Roof live load=20 psf, ceiling attached to rafters, L/Δ = 240)

RAFTER SPACING (inches)	SPECIES AND GRADE	DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
		2 × 4	2 × 6	2 × 8	2 × 10	2 × 12	2 × 4	2 × 6	2 × 8	2 × 10	2 × 12
		Maximum rafter spans ^a									
		(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
12	Douglas fir-larch SS	10-5	16-4	21-7	Note b	Note b	10-5	16-4	21-7	Note b	Note b
	Douglas fir-larch #1	10-0	15-9	20-10	Note b	Note b	10-0	15-4	19-5	23-9	Note b
	Douglas fir-larch #2	9-10	15-6	20-5	25-8	Note b	9-10	14-4	18-2	22-3	25-9
	Douglas fir-larch #3	8-7	12-6	15-10	19-5	22-6	7-5	10-10	13-9	16-9	19-6
	Hem-fir SS	9-10	15-6	20-5	Note b	Note b	9-10	15-6	20-5	Note b	Note b
	Hem-fir #1	9-8	15-2	19-11	25-5	Note b	9-8	14-11	18-11	23-2	Note b
	Hem-fir #2	9-2	14-5	19-0	24-3	Note b	9-2	14-2	17-11	21-11	25-5
	Hem-fir #3	8-7	12-6	15-10	19-5	22-6	7-5	10-10	13-9	16-9	19-6
	Southern pine SS	10-3	16-1	21-2	Note b	Note b	10-3	16-1	21-2	Note b	Note b
	Southern pine #1	10-0-9-10	15-9-15-6	20-10-20-5	Note b	Note b	10-0-9-10	15-9-15-6	20-10-19-10	25-10-23-2	Note b
	Southern pine #2	9-10-9-5	15-6-14-9	20-5-19-6	Note b-23-5	Note b	9-10-9-0	15-1-13-6	19-5-17-1	23-2-20-3	Note b-23-10
	Southern pine #3	9-1-8-0	13-6-11-9	17-2-14-10	20-3-18-0	24-1-21-4	7-11-6-11	11-8-10-2	14-10-12-10	17-6-15-7	20-11-18-6
	Spruce-pine-fir SS	9-8	15-2	19-11	25-5	Note b	9-8	15-2	19-11	25-5	Note b
	Spruce-pine-fir #1	9-5	14-9	19-6	24-10	Note b	9-5	14-4	18-2	22-3	25-9
	Spruce-pine-fir #2	9-5	14-9	19-6	24-10	Note b	9-5	14-4	18-2	22-3	25-9
Spruce-pine-fir #3	8-7	12-6	15-10	19-5	22-6	7-5	10-10	13-9	16-9	19-6	
16	Douglas fir-larch SS	9-6	14-11	19-7	25-0	Note b	9-6	14-11	19-7	24-9	Note b
	Douglas fir-larch #1	9-1	14-4	18-11	23-9	Note b	9-1	13-3	16-10	20-7	23-10
	Douglas fir-larch #2	8-11	14-1	18-2	22-3	25-9	8-6	12-5	15-9	19-3	22-4
	Douglas fir-larch #3	7-5	10-10	13-9	16-9	19-6	6-5	9-5	11-11	14-6	16-10
	Hem-fir SS	8-11	14-1	18-6	23-8	Note b	8-11	14-1	18-6	23-8	Note b
	Hem-fir #1	8-9	13-9	18-1	23-1	Note b	8-9	12-11	16-5	20-0	23-3
	Hem-fir #2	8-4	13-1	17-3	21-11	25-5	8-4	12-3	15-6	18-11	22-0
	Hem-fir #3	7-5	10-10	13-9	16-9	19-6	6-5	9-5	11-11	14-6	16-10
	Southern pine SS	9-4	14-7	19-3	24-7	Note b	9-4	14-7	19-3	24-7	Note b
	Southern pine #1	9-1-8-11	14-4-14-1	18-11-18-6	24-1-23-2	Note b	9-1-8-11	14-4-13-7	18-10-17-2	22-4-20-1	Note b-23-10
	Southern pine #2	8-11-8-7	14-1-13-5	18-6-17-1	23-2-20-3	Note b-23-10	8-11-7-9	13-0-11-8	16-10-14-9	20-1-17-6	23-7-20-8
	Southern pine #3	7-11-6-11	11-8-10-2	14-10-12-10	17-6-15-7	20-11-18-6	6-10-6-0	10-1-8-10	12-10-11-2	15-2-13-6	18-1-16-0
	Spruce-pine-fir SS	8-9	13-9	18-1	23-1	Note b	8-9	13-9	18-1	23-0	Note b
	Spruce-pine-fir #1	8-7	13-5	17-9	22-3	25-9	8-6	12-5	15-9	19-3	22-4
	Spruce-pine-fir #2	8-7	13-5	17-9	22-3	25-9	8-6	12-5	15-9	19-3	22-4
Spruce-pine-fir #3	7-5	10-10	13-9	16-9	19-6	6-5	9-5	11-11	14-6	16-10	
19.2	Douglas fir-larch SS	8-11	14-0	18-5	23-7	Note b	8-11	14-0	18-5	22-7	Note b
	Douglas fir-larch #1	8-7	13-6	17-9	21-8	25-2	8-4	12-2	15-4	18-9	21-9
	Douglas fir-larch #2	8-5	13-1	16-7	20-3	23-6	7-9	11-4	14-4	17-7	20-4
	Douglas fir-larch #3	6-9	9-11	12-7	15-4	17-9	5-10	8-7	10-10	13-3	15-5
	Hem-fir SS	8-5	13-3	17-5	22-3	Note b	8-5	13-3	17-5	22-3	25-9
	Hem-fir #1	8-3	12-11	17-1	21-1	24-6	8-1	11-10	15-0	18-4	21-3
	Hem-fir #2	7-10	12-4	16-3	20-0	23-2	7-8	11-2	14-2	17-4	20-1
	Hem-fir #3	6-9	9-11	12-7	15-4	17-9	5-10	8-7	10-10	13-3	15-5

(continued)

TABLE R802.5.1(2)—continued
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Roof live load=20 psf, ceiling attached to rafters, L/Δ = 240)

RAFTER SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 × 4	2 × 6	2 × 8	2 × 10	2 × 12	2 × 4	2 × 6	2 × 8	2 × 10	2 × 12
			Maximum rafter spans ^a									
			(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
19.2	Southern pine	SS	8-9	13-9	18-1 18-2	23-1	Note b	8-9	13-9	18-1 18-2	23-1	Note b
	Southern pine	#1	8-7 8-5	13-6 13-3	17-9 17-5	22-8 21-2	Note b-25-2	8-7 8-4	13-6 12-4	17-2 15-8	20-5 18-4	24-4 21-9
	Southern pine	#2	8-5 8-1	13-3 12-3	17-5 15-7	21-2 18-6	24-10 21-9	8-4 7-1	11-11 10-8	15-4 13-6	18-4 16-0	21-6 18-10
	Southern pine	#3	7-3 6-4	10-8 9-4	13-7 11-9	16-0 14-3	19-1 16-10	6-3 5-6	9-3 8-1	11-9 10-2	13-10 12-4	16-6 14-7
	Spruce-pine-fir	SS	8-3	12-11	17-1	21-9	Note b	8-3	12-11	17-1	21-0	24-4
	Spruce-pine-fir	#1	8-1	12-8	16-7	20-3	23-6	7-9	11-4	14-4	17-7	20-4
	Spruce-pine-fir	#2	8-1	12-8	16-7	20-3	23-6	7-9	11-4	14-4	17-7	20-4
	Spruce-pine-fir	#3	6-9	9-11	12-7	15-4	17-9	5-10	8-7	10-10	13-3	15-5
24	Douglas fir-larch	SS	8-3	13-0	17-2	21-10	Note b	8-3	13-0	16-7	20-3	23-5
	Douglas fir-larch	#1	8-0	12-6	15-10	19-5	22-6	7-5	10-10	13-9	16-9	19-6
	Douglas fir-larch	#2	7-10	11-9	14-10	18-2	21-0	6-11	10-2	12-10	15-8	18-3
	Douglas fir-larch	#3	6-1	8-10	11-3	13-8	15-11	5-3	7-8	9-9	11-10	13-9
	Hem-fir	SS	7-10	12-3	16-2	20-8	25-1	7-10	12-3	16-2	19-10	23-0
	Hem-fir	#1	7-8	12-0	15-6	18-11	21-11	7-3	10-7	13-5	16-4	19-0
	Hem-fir	#2	7-3	11-5	14-8	17-10	20-9	6-10	10-0	12-8	15-6	17-11
	Hem-fir	#3	6-1	8-10	11-3	13-8	15-11	5-3	7-8	9-9	11-10	13-9
	Southern pine	SS	8-1	12-9	16-10	21-6	Note b	8-1	12-9	16-10	21-6 20-10	Note b-24-8
	Southern pine	#1	8-0 7-10	12-6 12-3	16-6 16-2	21-1 18-11	25-2 22-6	8-0 7-5	12-3 11-1	15-4 14-0	18-3 16-5	21-9 19-6
	Southern pine	#2	7-10 7-4	12-3 11-0	15-10 13-11	18-11 16-6	22-2 19-6	7-5 6-4	10-8 9-6	13-9 12-1	16-5 14-4	19-3 16-10
	Southern pine	#3	6-5 5-8	9-6 8-4	12-1 10-6	14-4 12-9	17-1 15-1	5-7 4-11	8-3 7-3	10-6 9-1	12-5 11-0	14-9 13-1
	Spruce-pine-fir	SS	7-8	12-0	15-10	20-2	24-7	7-8	12-0	15-4	18-9	21-9
	Spruce-pine-fir	#1	7-6	11-9	14-10	18-2	21-0	6-11	10-2	12-10	15-8	18-3
	Spruce-pine-fir	#2	7-6	11-9	14-10	18-2	21-0	6-11	10-2	12-10	15-8	18-3
	Spruce-pine-fir	#3	6-1	8-10	11-3	13-8	15-11	5-3	7-8	9-9	11-10	13-9

Check sources for availability of lumber in lengths greater than 20 feet.

SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

H _c /H _R	Rafter Span Adjustment Factor
1/3	0.67
1/4	0.76
1/5	0.83
1/6	0.90
1/7.5 or less	1.00

ere:

= Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

= Height of roof ridge measured vertically above the top of the rafter support walls.

Span exceeds 26 feet in length.

TABLE R802.5.1(3)
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Ground snow load=30 psf, ceiling not attached to rafters, L/Δ = 180)

RAFTER SPACING (inches)	SPECIES AND GRADE	DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
		2 × 4	2 × 6	2 × 8	2 × 10	2 × 12	2 × 4	2 × 6	2 × 8	2 × 10	2 × 12
		Maximum rafter spans ^a									
		(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
12	Douglas fir-larch SS	10-0	15-9	20-9	Note b	Note b	10-0	15-9	20-1	24-6	Note b
	Douglas fir-larch #1	9-8	14-9	18-8	22-9	Note b	9-0	13-2	16-8	20-4	23-7
	Douglas fir-larch #2	9-5	13-9	17-5	21-4	24-8	8-5	12-4	15-7	19-1	22-1
	Douglas fir-larch #3	7-1	10-5	13-2	16-1	18-8	6-4	9-4	11-9	14-5	16-8
	Hem-fir SS	9-6	14-10	19-7	25-0	Note b	9-6	14-10	19-7	24-1	Note b
	Hem-fir #1	9-3	14-4	18-2	22-2	25-9	8-9	12-10	16-3	19-10	23-0
	Hem-fir #2	8-10	13-7	17-2	21-0	24-4	8-4	12-2	15-4	18-9	21-9
	Hem-fir #3	7-1	10-5	13-2	16-1	18-8	6-4	9-4	11-9	14-5	16-8
	Southern pine SS	9-10	15-6	20-5	Note b	Note b	9-10	15-6	20-5	Note b-25-4	Note b
	Southern pine #1	9-8-9-6	15-2-14-10	20-0-19-0	24-9-22-3	Note b	9-8-9-0	14-10-13-5	18-8-17-0	22-2-19-11	Note b-23-7
	Southern pine #2	9-6-8-7	14-5-12-11	18-8-16-4	22-3-19-5	Note b-22-10	9-0-7-8	12-11-11-7	16-8-14-8	19-11-17-4	23-4-20-5
	Southern pine #3	7-7-6-7	11-2-9-9	14-3-12-4	16-10-15-0	20-0-17-9	6-9-5-11	10-0-8-9	12-9-11-0	15-1-13-5	17-11-15-10
	Spruce-pine-fir SS	9-3	14-7	19-2	24-6	Note b	9-3	14-7	18-8	22-9	Note b
	Spruce-pine-fir #1	9-1	13-9	17-5	21-4	24-8	8-5	12-4	15-7	19-1	22-1
Spruce-pine-fir #2	9-1	13-9	17-5	21-4	24-8	8-5	12-4	15-7	19-1	22-1	
Spruce-pine-fir #3	7-1	10-5	13-2	16-1	18-8	6-4	9-4	11-9	14-5	16-8	
16	Douglas fir-larch SS	9-1	14-4	18-10	23-9	Note b	9-1	13-9	17-5	21-3	24-8
	Douglas fir-larch #1	8-9	12-9	16-2	19-9	22-10	7-10	11-5	14-5	17-8	20-5
	Douglas fir-larch #2	8-2	11-11	15-1	18-5	21-5	7-3	10-8	13-6	16-6	19-2
	Douglas fir-larch #3	6-2	9-0	11-5	13-11	16-2	5-6	8-1	10-3	12-6	14-6
	Hem-fir SS	8-7	13-6	17-10	22-9	Note b	8-7	13-6	17-1	20-10	24-2
	Hem-fir #1	8-5	12-5	15-9	19-3	22-3	7-7	11-1	14-1	17-2	19-11
	Hem-fir #2	8-0	11-9	14-11	18-2	21-1	7-2	10-6	13-4	16-3	18-10
	Hem-fir #3	6-2	9-0	11-5	13-11	16-2	5-6	8-1	10-3	12-6	14-6
	Southern pine SS	8-11	14-1	18-6	23-8	Note b	8-11	14-1	18-6-18-5	23-8-21-11	Note b-25-11
	Southern pine #1	8-9-8-7	13-9-13-0	18-1-16-6	21-5-19-3	25-7-22-10	8-8-7-10	12-10-11-7	16-2-14-9	19-2-17-3	22-10-20-5
	Southern pine #2	8-7-7-6	12-6-11-2	16-2-14-2	19-3-16-10	22-7-19-10	7-10-6-8	11-2-10-0	14-5-12-8	17-3-15-1	20-2-17-9
	Southern pine #3	6-7-5-9	9-8-8-6	12-4-10-8	14-7-13-0	17-4-15-4	5-10-5-2	8-8-7-7	11-0-9-7	13-0-11-7	15-6-13-9
	Spruce-pine-fir SS	8-5	13-3	17-5	22-1	25-7	8-5	12-9	16-2	19-9	22-10
	Spruce-pine-fir #1	8-2	11-11	15-1	18-5	21-5	7-3	10-8	13-6	16-6	19-2
Spruce-pine-fir #2	8-2	11-11	15-1	18-5	21-5	7-3	10-8	13-6	16-6	19-2	
Spruce-pine-fir #3	6-2	9-0	11-5	13-11	16-2	5-6	8-1	10-3	12-6	14-6	
19.2	Douglas fir-larch SS	8-7	13-6	17-9	21-8	25-2	8-7	12-6	15-10	19-5	22-6
	Douglas fir-larch #1	7-11	11-8	14-9	18-0	20-11	7-1	10-5	13-2	16-1	18-8
	Douglas fir-larch #2	7-5	10-11	13-9	16-10	19-6	6-8	9-9	12-4	15-1	17-6
	Douglas fir-larch #3	5-7	8-3	10-5	12-9	14-9	5-0	7-4	9-4	11-5	13-2
	Hem-fir SS	8-1	12-9	16-9	21-4	24-8	8-1	12-4	15-7	19-1	22-1
	Hem-fir #1	7-9	11-4	14-4	17-7	20-4	6-11	10-2	12-10	15-8	18-2
	Hem-fir #2	7-4	10-9	13-7	16-7	19-3	6-7	9-7	12-2	14-10	17-3
	Hem-fir #3	5-7	8-3	10-5	12-9	14-9	5-0	7-4	9-4	11-5	13-2

(continued)

TABLE R802.5.1(3)—continued
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Ground snow load=30 psf, ceiling not attached to rafters, L/Δ = 180)

RAFTER SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 × 4	2 × 6	2 × 8	2 × 10	2 × 12	2 × 4	2 × 6	2 × 8	2 × 10	2 × 12
			Maximum rafter spans ^a									
			(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
19.2	Southern pine	SS	8-5	13-3	17-5	22-3	Note b	8-5	13-3	17-5-16-10	22-0-20-0	25-9-23-7
	Southern pine	#1	8-3-8-0	13-0-11-10	16-6-15-1	19-7-17-7	23-4-20-11	7-11-7-1	11-9-10-7	14-9-13-5	17-6-15-9	20-11-18-8
	Southern pine	#2	7-11-6-10	11-5-10-2	14-9-12-11	17-7-15-4	20-7-18-1	7-1-6-1	10-2-9-2	13-2-11-7	15-9-13-9	18-5-16-2
	Southern pine	#3	6-0-5-3	8-10-7-9	11-3-9-9	13-4-11-10	15-10-14-0	5-4-4-8	7-11-6-11	10-1-8-9	11-11-10-7	14-2-12-6
	Spruce-pine-fir	SS	7-11	12-5	16-5	20-2	23-4	7-11	11-8	14-9	18-0	20-11
	Spruce-pine-fir	#1	7-5	10-11	13-9	16-10	19-6	6-8	9-9	12-4	15-1	17-6
	Spruce-pine-fir	#2	7-5	10-11	13-9	16-10	19-6	6-8	9-9	12-4	15-1	17-6
	Spruce-pine-fir	#3	5-7	8-3	10-5	12-9	14-9	5-0	7-4	9-4	11-5	13-2
24	Douglas fir-larch	SS	7-11	12-6	15-10	19-5	22-6	7-8	11-3	14-2	17-4	20-1
	Douglas fir-larch	#1	7-1	10-5	13-2	16-1	18-8	6-4	9-4	11-9	14-5	16-8
	Douglas fir-larch	#2	6-8	9-9	12-4	15-1	17-6	5-11	8-8	11-0	13-6	15-7
	Douglas fir-larch	#3	5-0	7-4	9-4	11-5	13-2	4-6	6-7	8-4	10-2	11-10
	Hem-fir	SS	7-6	11-10	15-7	19-1	22-1	7-6	11-0	13-11	17-0	19-9
	Hem-fir	#1	6-11	10-2	12-10	15-8	18-2	6-2	9-1	11-6	14-0	16-3
	Hem-fir	#2	6-7	9-7	12-2	14-10	17-3	5-10	8-7	10-10	13-3	15-5
	Hem-fir	#3	5-0	7-4	9-4	11-5	13-2	4-6	6-7	8-4	10-2	11-10
	Southern pine	SS	7-10	12-3	16-2	20-8-20-0	25-1-23-7	7-10	12-3-11-10	16-2-15-0	19-8-17-11	23-0-21-2
	Southern pine	#1	7-8-7-1	11-9-10-7	14-9-13-5	17-6-15-9	20-11-18-8	7-1-6-4	10-6-9-6	13-2-12-0	15-8-14-1	18-8-16-8
	Southern pine	#2	7-1-6-1	10-2-9-2	13-2-11-7	15-9-13-9	18-5-16-2	6-4-5-5	9-2-8-2	11-9-10-4	14-1-12-3	16-6-14-6
	Southern pine	#3	5-4-4-8	7-11-6-11	10-1-8-9	11-11-10-7	14-2-12-6	4-9-4-2	7-1-6-2	9-0-7-10	10-8-9-6	12-8-11-2
	Spruce-pine-fir	SS	7-4	11-7	14-9	18-0	20-11	7-1	10-5	13-2	16-1	18-8
	Spruce-pine-fir	#1	6-8	9-9	12-4	15-1	17-6	5-11	8-8	11-0	13-6	15-7
	Spruce-pine-fir	#2	6-8	9-9	12-4	15-1	17-6	5-11	8-8	11-0	13-6	15-7
	Spruce-pine-fir	#3	5-0	7-4	9-4	11-5	13-2	4-6	6-7	8-4	10-2	11-10

Check sources for availability of lumber in lengths greater than 20 feet.

SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

H_c/H_r	Rafter Span Adjustment Factor
1/3	0.67
1/4	0.76
1/5	0.83
1/6	0.90
1/7.5 or less	1.00

where:

H_c = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

H_r = Height of roof ridge measured vertically above the top of the rafter support walls.

Span exceeds 26 feet in length.

TABLE R802.5.1(4)
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Ground snow load=50 psf, ceiling not attached to rafters, L/Δ = 180)

RAFTER SPACING (inches)	SPECIES AND GRADE	DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
		2 × 4	2 × 6	2 × 8	2 × 10	2 × 12	2 × 4	2 × 6	2 × 8	2 × 10	2 × 12
		Maximum rafter spans ^a									
		(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
12	Douglas fir-larch SS	8-5	13-3	17-6	22-4	26-0	8-5	13-3	17-0	20-9	24-0
	Douglas fir-larch #1	8-2	12-0	15-3	18-7	21-7	7-7	11-2	14-1	17-3	20-0
	Douglas fir-larch #2	7-8	11-3	14-3	17-5	20-2	7-1	10-5	13-2	16-1	18-8
	Douglas fir-larch #3	5-10	8-6	10-9	13-2	15-3	5-5	7-10	10-0	12-2	14-1
	Hem-fir SS	8-0	12-6	16-6	21-1	25-6	8-0	12-6	16-6	20-4	23-7
	Hem-fir #1	7-10	11-9	14-10	18-1	21-0	7-5	10-10	13-9	16-9	19-5
	Hem-fir #2	7-5	11-1	14-0	17-2	19-11	7-0	10-3	13-0	15-10	18-5
	Hem-fir #3	5-10	8-6	10-9	13-2	15-3	5-5	7-10	10-0	12-2	14-1
	Southern pine SS	8-4	13-0 13-1	17-2	21-11	Note b	8-4	13-0 13-1	17-2	21-11 21-5	Note b-25-3
	Southern pine #1	8-2 8-0	12-10 12-3	16-10 15-6	20-3 18-2	24-1 21-7	8-2 7-7	12-6 11-4	15-9 14-5	18-9 16-10	22-4 20-0
	Southern pine #2	8-0 7-0	11-9 10-6	15-3 13-4	18-2 15-10	21-3 18-8	7-7 6-6	10-11 9-9	14-1 12-4	16-10 14-8	19-9 17-3
	Southern pine #3	6-2 5-5	9-2 8-0	11-8 10-1	13-9 12-3	16-4 14-6	5-9 5-0	8-5 7-5	10-9 9-4	12-9 11-4	15-2 13-5
	Spruce-pine-fir SS	7-10	12-3	16-2	20-8	24-1	7-10	12-3	15-9	19-3	22-4
	Spruce-pine-fir #1	7-8	11-3	14-3	17-5	20-2	7-1	10-5	13-2	16-1	18-8
	Spruce-pine-fir #2	7-8	11-3	14-3	17-5	20-2	7-1	10-5	13-2	16-1	18-8
	Spruce-pine-fir #3	5-10	8-6	10-9	13-2	15-3	5-5	7-10	10-0	12-2	14-1
16	Douglas fir-larch SS	7-8	12-1	15-10	19-5	22-6	7-8	11-7	14-8	17-11	20-10
	Douglas fir-larch #1	7-1	10-5	13-2	16-1	18-8	6-7	9-8	12-2	14-11	17-3
	Douglas fir-larch #2	6-8	9-9	12-4	15-1	17-6	6-2	9-0	11-5	13-11	16-2
	Douglas fir-larch #3	5-0	7-4	9-4	11-5	13-2	4-8	6-10	8-8	10-6	12-3
	Hem-fir SS	7-3	11-5	15-0	19-1	22-1	7-3	11-5	14-5	17-8	20-5
	Hem-fir #1	6-11	10-2	12-10	15-8	18-2	6-5	9-5	11-11	14-6	16-10
	Hem-fir #2	6-7	9-7	12-2	14-10	17-3	6-1	8-11	11-3	13-9	15-11
	Hem-fir #3	5-0	7-4	9-4	11-5	13-2	4-8	6-10	8-8	10-6	12-3
	Southern pine SS	7-6	11-10	15-7	19-11	24-3 23-7	7-6	11-10	15-7	19-11 18-6	23-10 21-10
	Southern pine #1	7-5 7-1	11-7 10-7	14-9 13-5	17-6 15-9	20-11 18-8	7-4 6-7	10-10 9-10	13-8 12-5	16-2 14-7	19-4 17-3
	Southern pine #2	7-1 6-1	10-2 9-2	13-2 11-7	15-9 13-9	18-5 16-2	6-7 5-8	9-5 8-5	12-2 10-9	14-7 12-9	17-1 15-0
	Southern pine #3	5-4 4-8	7-11 6-11	10-1 8-9	11-11 10-7	14-2 12-6	4-11 4-4	7-4 6-5	9-4 8-1	11-0 9-10	13-1 11-7
	Spruce-pine-fir SS	7-1	11-2	14-8	18-0	20-11	7-1	10-9	13-8	15-11	19-4
	Spruce-pine-fir #1	6-8	9-9	12-4	15-1	17-6	6-2	9-0	11-5	13-11	16-2
	Spruce-pine-fir #2	6-8	9-9	12-4	15-1	17-6	6-2	9-0	11-5	13-11	16-2
	Spruce-pine-fir #3	5-0	7-4	9-4	11-5	13-2	4-8	6-10	8-8	10-6	12-3
19.2	Douglas fir-larch SS	7-3	11-4	14-6	17-8	20-6	7-3	10-7	13-5	16-5	19-0
	Douglas fir-larch #1	6-6	9-6	12-0	14-8	17-1	6-0	8-10	11-2	13-7	15-9
	Douglas fir-larch #2	6-1	8-11	11-3	13-9	15-11	5-7	8-3	10-5	12-9	14-9
	Douglas fir-larch #3	4-7	6-9	8-6	10-5	12-1	4-3	6-3	7-11	9-7	11-2
	Hem-fir SS	6-10	10-9	14-2	17-5	20-2	6-10	10-5	13-2	16-1	18-8
	Hem-fir #1	6-4	9-3	11-9	14-4	16-7	5-10	8-7	10-10	13-3	15-5
	Hem-fir #2	6-0	8-9	11-1	13-7	15-9	5-7	8-1	10-3	12-7	14-7
	Hem-fir #3	4-7	6-9	8-6	10-5	12-1	4-3	6-3	7-11	9-7	11-2

(continued)

TABLE R802.5.1(4)
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Ground snow load=50 psf, ceiling not attached to rafters, L/Δ = 180)

RAFTER SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 × 4	2 × 6	2 × 8	2 × 10	2 × 12	2 × 4	2 × 6	2 × 8	2 × 10	2 × 12
			Maximum rafter spans ^a									
		(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	
19.2	Southern pine	SS	7-1	11-2	14-8	18-9 <u>18-3</u>	22-10 <u>21-7</u>	7-1	11-2	14-8 <u>14-2</u>	18-7 <u>16-11</u>	21-9 <u>20-0</u>
	Southern pine	#1	7-0 <u>6-6</u>	10-8 <u>9-8</u>	13-5 <u>12-3</u>	16-0 <u>14-4</u>	19-1 <u>17-1</u>	6-8 <u>6-0</u>	9-11 <u>9-0</u>	12-5 <u>11-4</u>	14-10 <u>13-4</u>	17-8 <u>15-9</u>
	Southern pine	#2	6-6 <u>5-7</u>	9-4 <u>8-4</u>	12-0 <u>10-7</u>	14-4 <u>12-6</u>	16-10 <u>14-9</u>	6-0 <u>5-2</u>	8-8 <u>7-9</u>	11-2 <u>9-9</u>	13-4 <u>11-7</u>	15-7 <u>13-8</u>
	Southern pine	#3	4-11 <u>4-3</u>	7-3 <u>6-4</u>	9-2 <u>8-0</u>	10-10 <u>9-8</u>	12-11 <u>11-5</u>	4-6 <u>4-0</u>	6-8 <u>5-10</u>	8-6 <u>7-4</u>	10-1 <u>8-11</u>	12-0 <u>10-7</u>
	Spruce-pine-fir	SS	6-8	10-6	13-5	16-5	19-1	6-8	9-10	12-5	15-3	17-8
	Spruce-pine-fir	#1	6-1	8-11	11-3	13-9	15-11	5-7	8-3	10-5	12-9	14-9
	Spruce-pine-fir	#2	6-1	8-11	11-3	13-9	15-11	5-7	8-3	10-5	12-9	14-9
	Spruce-pine-fir	#3	4-7	6-9	8-6	10-5	12-1	4-3	6-3	7-11	9-7	11-2
24	Douglas fir-larch	SS	6-8	10-	13-0	15-10	18-4	6-6	9-6	12-0	14-8	17-0
	Douglas fir-larch	#1	5-10	8-6	10-9	13-2	15-3	5-5	7-10	10-0	12-2	14-1
	Douglas fir-larch	#2	5-5	7-11	10-1	12-4	14-3	5-0	7-4	9-4	11-5	13-2
	Douglas fir-larch	#3	4-1	6-0	7-7	9-4	10-9	3-10	5-7	7-1	8-7	10-0
	Hem-fir	SS	6-4	9-11	12-9	15-7	18-0	6-4	9-4	11-9	14-5	16-8
	Hem-fir	#1	5-8	8-3	10-6	12-10	14-10	5-3	7-8	9-9	11-10	13-9
	Hem-fir	#2	5-4	7-10	9-11	12-1	14-1	4-11	7-3	9-2	11-3	13-0
	Hem-fir	#3	4-1	6-0	7-7	9-4	10-9	3-10	5-7	7-1	8-7	10-0
	Southern pine	SS	6-7	10-4	13-8	17-5 <u>16-4</u>	21-0 <u>19-3</u>	6-7	10-4 <u>10-0</u>	13-8 <u>12-8</u>	16-7 <u>15-2</u>	19-5 <u>17-10</u>
	Southern pine	#1	6-5 <u>5-10</u>	9-7 <u>8-8</u>	12-0 <u>11-0</u>	14-4 <u>12-10</u>	17-1 <u>15-3</u>	6-0 <u>5-5</u>	8-10 <u>8-0</u>	11-2 <u>10-2</u>	13-3 <u>11-11</u>	15-9 <u>14-1</u>
	Southern pine	#2	5-10 <u>5-0</u>	8-4 <u>7-5</u>	10-9 <u>9-5</u>	12-10 <u>11-3</u>	15-1 <u>13-2</u>	5-5 <u>4-7</u>	7-9 <u>6-11</u>	10-0 <u>8-9</u>	11-11 <u>10-5</u>	13-11 <u>12-3</u>
	Southern pine	#3	4-4 <u>3-10</u>	6-5 <u>5-8</u>	8-3 <u>7-1</u>	9-9 <u>8-8</u>	11-7 <u>10-3</u>	4-1 <u>3-6</u>	6-0 <u>5-3</u>	7-7 <u>6-7</u>	9-0 <u>8-0</u>	10-8 <u>9-6</u>
	Spruce-pine-fir	SS	6-2	9-6	12-0	14-8	17-1	6-0	8-10	11-2	13-7	15-9
	Spruce-pine-fir	#1	5-5	7-11	10-1	12-4	14-3	5-0	7-4	9-4	11-5	13-2
	Spruce-pine-fir	#2	5-5	7-11	10-1	12-4	14-3	5-0	7-4	9-4	11-5	13-2
	Spruce-pine-fir	#3	4-1	6-0	7-7	9-4	10-9	3-10	5-7	7-1	8-7	10-0

Check sources for availability of lumber in lengths greater than 20 feet.

SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa

The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

H_c/H_R	Rafter Span Adjustment Factor
1/3	0.67
1/4	0.76
1/5	0.83
1/6	0.90
1/7.5 or less	1.00

where:

H_c = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

H_R = Height of roof ridge measured vertically above the top of the rafter support walls.

Span exceeds 26 feet in length.

TABLE R802.5.1(5)
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Ground snow load=30 psf, ceiling attached to rafters, L/Δ = 240)

RAFTER SPACING (inches)	SPECIES AND GRADE	DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
		2 x 4	2 x 6	2 x 8	2 x 10	2 x 12	2 x 4	2 x 6	2 x 8	2 x 10	2 x 12
		Maximum rafter spans*									
		(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)				
12	Douglas fir-larch SS	9-1	14-4	18-10	24-1	Note b	9-1	14-4	18-10	24-1	Note b
	Douglas fir-larch #1	8-9	13-9	18-2	22-9	Note b	8-9	13-2	16-8	20-4	23-7
	Douglas fir-larch #2	8-7	13-6	17-5	21-4	24-8	8-5	12-4	15-7	19-1	22-1
	Douglas fir-larch #3	7-1	10-5	13-2	16-1	18-8	6-4	9-4	11-9	14-5	16-8
	Hem-fir SS	8-7	13-6	17-10	22-9	Note b	8-7	13-6	17-10	22-9	Note b
	Hem-fir #1	8-5	13-3	17-5	22-2	25-9	8-5	12-10	16-3	19-10	23-0
	Hem-fir #2	8-0	12-7	16-7	21-0	24-4	8-0	12-2	15-4	18-9	21-9
	Hem-fir #3	7-1	10-5	13-2	16-1	18-8	6-4	9-4	11-9	14-5	16-8
	Southern pine SS	8-11	14-1	18-6	23-8	Note b	8-11	14-1	18-6	23-8	Note b
	Southern pine #1	8-9 8-7	13-9 13-6	18-2 17-10	23-2 22-3	Note b	8-9 8-7	13-9 13-5	18-2 17-0	22-2 19-11	Note b 23-7
	Southern pine #2	8-7 8-3	13-6 12-11	17-10 16-4	22-3 19-5	Note b 22-10	8-7 7-8	12-11 11-7	16-8 14-8	19-11 17-4	23-4 20-5
	Southern pine #3	7-7 6-7	11-2 9-9	14-3 12-4	16-10 15-0	20-0 17-9	6-9 5-11	10-0 8-9	12-9 11-0	15-1 13-5	17-11 15-10
	Spruce-pine-fir SS	8-5	13-3	17-5	22-3	Note b	8-5	13-3	17-5	22-3	Note b
	Spruce-pine-fir #1	8-3	12-11	17-0	21-4	24-8	8-3	12-4	15-7	19-1	22-1
	Spruce-pine-fir #2	8-3	12-11	17-0	21-4	24-8	8-3	12-4	15-7	19-1	22-1
	Spruce-pine-fir #3	7-1	10-5	13-2	16-1	18-8	6-4	9-4	11-9	14-5	16-8
16	Douglas fir-larch SS	8-3	13-0	17-2	21-10	Note b	8-3	13-0	17-2	21-3	24-8
	Douglas fir-larch #1	8-0	12-6	16-2	19-9	22-10	7-10	11-5	14-5	17-8	20-5
	Douglas fir-larch #2	7-10	11-11	15-1	18-5	21-5	7-3	10-8	13-6	16-6	19-2
	Douglas fir-larch #3	6-2	9-0	11-5	13-11	16-2	5-6	8-1	10-3	12-6	14-6
	Hem-fir SS	7-10	12-3	16-2	20-8	25-1	7-10	12-3	16-2	20-8	24-2
	Hem-fir #1	7-8	12-0	15-9	19-3	22-3	7-7	11-1	14-1	17-2	19-11
	Hem-fir #2	7-3	11-5	14-11	18-2	21-1	7-2	10-6	13-4	16-3	18-10
	Hem-fir #3	6-2	9-0	11-5	13-11	16-2	5-6	8-1	10-3	12-6	14-6
	Southern pine SS	8-1	12-9	16-10	21-6	Note b	8-1	12-9	16-10	21-6	Note b 25-11
	Southern pine #1	8-0 7-10	12-6 12-3	16-6 16-2	21-1 19-3	25-7 22-10	8-0 7-10	12-6 11-7	16-2 14-9	19-2 17-3	22-10 20-5
	Southern pine #2	7-10 7-6	12-3 11-2	16-2 14-2	19-3 16-10	22-7 19-10	7-10 6-8	11-2 10-0	14-5 12-8	17-3 15-1	20-2 17-9
	Southern pine #3	6-7 5-9	9-8 8-6	12-4 10-8	14-7 13-0	17-4 15-4	5-10 5-2	8-8 7-7	11-0 9-7	13-0 11-7	15-6 13-9
	Spruce-pine-fir SS	7-8	12-0	15-10	20-2	24-7	7-8	12-0	15-10	19-9	22-10
	Spruce-pine-fir #1	7-6	11-9	15-1	18-5	21-5	7-3	10-8	13-6	16-6	19-2
	Spruce-pine-fir #2	7-6	11-9	15-1	18-5	21-5	7-3	10-8	13-6	16-6	19-2
	Spruce-pine-fir #3	6-2	9-0	11-5	13-11	16-2	5-6	8-1	10-3	12-6	14-6
19.2	Douglas fir-larch SS	7-9	12-3	16-1	20-7	25-0	7-9	12-3	15-10	19-5	22-6
	Douglas fir-larch #1	7-6	11-8	14-9	18-0	20-11	7-1	10-5	13-2	16-1	18-8
	Douglas fir-larch #2	7-4	10-11	13-9	16-10	19-6	6-8	9-9	12-4	15-1	17-6
	Douglas fir-larch #3	5-7	8-3	10-5	12-9	14-9	5-0	7-4	9-4	11-5	13-2
	Hem-fir SS	7-4	11-7	15-3	19-5	23-7	7-4	11-7	15-3	19-1	22-1
	Hem-fir #1	7-2	11-4	14-4	17-7	20-4	6-11	10-2	12-10	15-8	18-2
	Hem-fir #2	6-10	10-9	13-7	16-7	19-3	6-7	9-7	12-2	14-10	17-3
	Hem-fir #3	5-7	8-3	10-5	12-9	14-9	5-0	7-4	9-4	11-5	13-2

(continued)

TABLE R802.5.1(5)—continued
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Ground snow load=30 psf, ceiling attached to rafters, L/Δ = 240)

RAFTER SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 × 4	2 × 6	2 × 8	2 × 10	2 × 12	2 × 4	2 × 6	2 × 8	2 × 10	2 × 12
			Maximum rafter spans ^a									
		(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	
19.2	Southern pine	SS	7-8	12-0	15-10	20-2	24-7	7-8	12-0	15-10	20-2-20-0	24-7-23-7
	Southern pine	#1	7-6-7-4	11-9-11-7	15-6-15-1	19-7-17-7	23-4-20-11	7-6-7-1	11-9-10-7	14-9-13-5	17-6-15-9	20-11-18-8
	Southern pine	#2	7-4-6-10	11-5-10-2	14-9-12-11	17-7-15-4	20-7-18-1	7-1-6-1	10-2-9-2	13-2-11-7	15-9-13-9	18-5-16-2
	Southern pine	#3	6-0-5-3	8-10-7-9	11-3-9-9	13-4-11-10	15-10-14-0	5-4-4-8	7-11-6-11	10-1-8-9	11-11-10-7	14-2-12-6
	Spruce-pine-fir	SS	7-2	11-4	14-11	19-0	23-1	7-2	11-4	14-9	18-0	20-11
	Spruce-pine-fir	#1	7-0	10-11	13-9	16-10	19-6	6-8	9-9	12-4	15-1	17-6
	Spruce-pine-fir	#2	7-0	10-11	13-9	16-10	19-6	6-8	9-9	12-4	15-1	17-6
	Spruce-pine-fir	#3	5-7	8-3	10-5	12-9	14-9	5-0	7-4	9-4	11-5	13-2
24	Douglas fir-larch	SS	7-3	11-4	15-0	19-1	22-6	7-3	11-3	14-2	17-4	20-1
	Douglas fir-larch	#1	7-0	10-5	13-2	16-1	18-8	6-4	9-4	11-9	14-5	16-8
	Douglas fir-larch	#2	6-8	9-9	12-4	15-1	17-6	5-11	8-8	11-0	13-6	15-7
	Douglas fir-larch	#3	5-0	7-4	9-4	11-5	13-2	4-6	6-7	8-4	10-2	11-10
	Hem-fir	SS	6-10	10-9	14-2	18-0	21-11	6-10	10-9	13-11	17-0	19-9
	Hem-fir	#1	6-8	10-2	12-10	15-8	18-2	6-2	9-1	11-6	14-0	16-3
	Hem-fir	#2	6-4	9-7	12-2	14-10	17-3	5-10	8-7	10-10	13-3	15-5
	Hem-fir	#3	5-0	7-4	9-4	11-5	13-2	4-6	6-7	8-4	10-2	11-10
	Southern pine	SS	7-1	11-2	14-8	18-9	22-10	7-1	11-2	14-8	18-9-17-11	22-10-21-2
	Southern pine	#1	7-0-6-10	10-11-10-7	14-5-13-5	17-6-15-9	20-11-18-8	7-0-6-4	10-6-9-6	13-2-12-0	15-8-14-1	18-8-16-8
	Southern pine	#2	6-10-6-1	10-2-9-2	13-2-11-7	15-9-13-9	18-5-16-2	6-4-5-5	9-2-8-2	11-9-10-4	14-1-12-3	16-6-14-6
	Southern pine	#3	5-4-4-8	7-11-6-11	10-1-8-9	11-11-10-7	14-2-12-6	4-9-4-2	7-1-6-2	9-0-7-10	10-8-9-6	12-8-11-2
	Spruce-pine-fir	SS	6-8	10-6	13-10	17-8	20-11	6-8	10-5	13-2	16-1	18-8
	Spruce-pine-fir	#1	6-6	9-9	12-4	15-1	17-6	5-11	8-8	11-0	13-6	15-7
	Spruce-pine-fir	#2	6-6	9-9	12-4	15-1	17-6	5-11	8-8	11-0	13-6	15-7
	Spruce-pine-fir	#3	5-0	7-4	9-4	11-5	13-2	4-6	6-7	8-4	10-2	11-10

Check sources for availability of lumber in lengths greater than 20 feet.

SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

H_c/H_r	Rafter Span Adjustment Factor
1/3	0.67
1/4	0.76
1/5	0.83
1/6	0.90
1/7.5 or less	1.00

where:

H_c = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

H_r = Height of roof ridge measured vertically above the top of the rafter support walls.

Span exceeds 26 feet in length.

TABLE R802.5.1(6)
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Ground snow load=50 psf, ceiling attached to rafters, L/Δ = 240)

RAFTER SPACING (inches)	SPECIES AND GRADE	DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
		2 × 4	2 × 6	2 × 8	2 × 10	2 × 12	2 × 4	2 × 6	2 × 8	2 × 10	2 × 12
		Maximum rafter spans ^a									
		(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)
12	Douglas fir-larch SS	7-8	12-1	15-11	20-3	24-8	7-8	12-1	15-11	20-3	24-0
	Douglas fir-larch #1	7-5	11-7	15-3	18-7	21-7	7-5	11-2	14-1	17-3	20-0
	Douglas fir-larch #2	7-3	11-3	14-3	17-5	20-2	7-1	10-5	13-2	16-1	18-8
	Douglas fir-larch #3	5-10	8-6	10-9	13-2	15-3	5-5	7-10	10-0	12-2	14-1
	Hem-fir SS	7-3	11-5	15-0	19-2	23-4	7-3	11-5	15-0	19-2	23-4
	Hem-fir #1	7-1	11-2	14-8	18-1	21-0	7-1	10-10	13-9	16-9	19-5
	Hem-fir #2	6-9	10-8	14-0	17-2	19-11	6-9	10-3	13-0	15-10	18-5
	Hem-fir #3	5-10	8-6	10-9	13-2	15-3	5-5	7-10	10-0	12-2	14-1
	Southern pine SS	7-6	11-10	15-7	19-11	24-3	7-6	11-10	15-7	19-11	24-3
	Southern pine #1	7-5-7-3	11-7-11-5	15-4-15-0	19-7-18-2	23-9-21-7	7-5-7-3	11-7-11-4	15-4-14-5	18-9-16-10	22-4-20-0
	Southern pine #2	7-3-6-11	11-5-10-6	15-0-13-4	18-2-15-10	21-3-18-8	7-3-6-6	10-11-9-9	14-1-12-4	16-10-14-8	19-9-17-3
	Southern pine #3	6-2-5-5	9-2-8-0	11-8-10-1	13-9-12-3	16-4-14-6	5-9-5-0	8-5-7-5	10-9-9-4	12-9-11-4	15-2-13-5
	Spruce-pine-fir SS	7-1	11-2	14-8	18-9	22-10	7-1	11-2	14-8	18-9	22-4
	Spruce-pine-fir #1	6-11	10-11	14-3	17-5	20-2	6-11	10-5	13-2	16-1	18-8
	Spruce-pine-fir #2	6-11	10-11	14-3	17-5	20-2	6-11	10-5	13-2	16-1	18-8
	Spruce-pine-fir #3	5-10	8-6	10-9	13-2	15-3	5-5	7-10	10-0	12-2	14-1
16	Douglas fir-larch SS	7-0	11-0	14-5	18-5	22-5	7-0	11-0	14-5	17-11	20-10
	Douglas fir-larch #1	6-9	10-5	13-2	16-1	18-8	6-7	9-8	12-2	14-11	17-3
	Douglas fir-larch #2	6-7	9-9	12-4	15-1	17-6	6-2	9-0	11-5	13-11	16-2
	Douglas fir-larch #3	5-0	7-4	9-4	11-5	13-2	4-8	6-10	8-8	10-6	12-3
	Hem-fir SS	6-7	10-4	13-8	17-5	21-2	6-7	10-4	13-8	17-5	20-5
	Hem-fir #1	6-5	10-2	12-10	15-8	18-2	6-5	9-5	11-11	14-6	16-10
	Hem-fir #2	6-2	9-7	12-2	14-10	17-3	6-1	8-11	11-3	13-9	15-11
	Hem-fir #3	5-0	7-4	9-4	11-5	13-2	4-8	6-10	8-8	10-6	12-3
	Southern pine SS	6-10	10-9	14-2	18-1	22-0	6-10	10-9	14-2	18-1	22-0-21-10
	Southern pine #1	6-9-6-7	10-7-10-4	13-11-13-5	17-6-15-9	20-11-18-8	6-9-6-7	10-7-9-10	13-8-12-5	16-2-14-7	19-4-17-3
	Southern pine #2	6-7-6-1	10-2-9-2	13-2-11-7	15-9-13-9	18-5-16-2	6-7-5-8	9-5-8-5	12-2-10-9	14-7-12-9	17-1-15-0
	Southern pine #3	5-4-4-8	7-11-6-11	10-1-8-9	11-11-10-7	14-2-12-6	4-11-4-4	7-4-6-5	9-4-8-1	11-0-9-10	13-1-11-7
	Spruce-pine-fir SS	6-5	10-2	13-4	17-0	20-9	6-5	10-2	13-4	16-8	19-4
	Spruce-pine-fir #1	6-4	9-9	12-4	15-1	17-6	6-2	9-0	11-5	13-11	16-2
	Spruce-pine-fir #2	6-4	9-9	12-4	15-1	17-6	6-2	9-0	11-5	13-11	16-2
	Spruce-pine-fir #3	5-0	7-4	9-4	11-5	13-2	4-8	6-10	8-8	10-6	12-3
19.2	Douglas fir-larch SS	6-7	10-4	13-7	17-4	20-6	6-7	10-4	13-5	16-5	19-0
	Douglas fir-larch #1	6-4	9-6	12-0	14-8	17-1	6-0	8-10	11-2	13-7	15-9
	Douglas fir-larch #2	6-1	8-11	11-3	13-9	15-11	5-7	8-3	10-5	12-9	14-9
	Douglas fir-larch #3	4-7	6-9	8-6	10-5	12-1	4-3	6-3	7-11	9-7	11-2
	Hem-fir SS	6-2	9-9	12-10	16-5	19-11	6-2	9-9	12-10	16-1	18-8
	Hem-fir #1	6-1	9-3	11-9	14-4	16-7	5-10	8-7	10-10	13-3	15-5
	Hem-fir #2	5-9	8-9	11-1	13-7	15-9	5-7	8-1	10-3	12-7	14-7
	Hem-fir #3	4-7	6-9	8-6	10-5	12-1	4-3	6-3	7-11	9-7	11-2

(continued)

TABLE R802.5.1(6)—continued
RAFTER SPANS FOR COMMON LUMBER SPECIES
 (Ground snow load=50 psf, ceiling attached to rafters, L/Δ = 240)

RAFTER SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 × 4	2 × 6	2 × 8	2 × 10	2 × 12	2 × 4	2 × 6	2 × 8	2 × 10	2 × 12
			Maximum rafter spans ^a									
			(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)
19.2	Southern pine	SS	6-5	10-2	13-4	17-0	20-9	6-5	10-2	13-4	17-0-16-11	20-9-20-0
	Southern pine	#1	6-4-6-2	9-11-9-8	13-1-12-3	16-0-14-4	19-1-17-1	6-4-6-0	9-11-9-0	12-5-11-4	14-10-13-4	17-8-15-9
	Southern pine	#2	6-2-5-7	9-4-8-4	12-0-10-7	14-4-12-6	16-10-14-9	6-0-5-2	8-8-7-9	11-2-9-9	13-4-11-7	15-7-13-8
	Southern pine	#3	4-11-4-3	7-3-6-4	9-2-8-0	10-10-9-8	12-11-11-5	4-6-4-0	6-8-5-10	8-6-7-4	10-1-8-11	12-0-10-7
	Spruce-pine-fir	SS	6-1	9-6	12-7	16-0	19-1	6-1	9-6	12-5	15-3	17-8
	Spruce-pine-fir	#1	5-11	8-11	11-3	13-9	15-11	5-7	8-3	10-5	12-9	14-9
	Spruce-pine-fir	#2	5-11	8-11	11-3	13-9	15-11	5-7	8-3	10-5	12-9	14-9
	Spruce-pine-fir	#3	4-7	6-9	8-6	10-5	12-1	4-3	6-3	7-11	9-7	11-2
24	Douglas fir-larch	SS	6-1	9-7	12-7	15-10	18-4	6-1	9-6	12-0	14-8	17-0
	Douglas fir-larch	#1	5-10	8-6	10-9	13-2	15-3	5-5	7-10	10-0	12-2	14-1
	Douglas fir-larch	#2	5-5	7-11	10-1	12-4	14-3	5-0	7-4	9-4	11-5	13-2
	Douglas fir-larch	#3	4-1	6-0	7-7	9-4	10-9	3-10	5-7	7-1	8-7	10-0
	Hem-fir	SS	5-9	9-1	11-11	15-2	18-0	5-9	9-1	11-9	14-5	15-11
	Hem-fir	#1	5-8	8-3	10-6	12-10	14-10	5-3	7-8	9-9	11-10	13-9
	Hem-fir	#2	5-4	7-10	9-11	12-1	14-1	4-11	7-3	9-2	11-3	13-0
	Hem-fir	#3	4-1	6-0	7-7	9-4	10-9	3-10	5-7	7-1	8-7	10-0
	Southern pine	SS	6-0	9-5	12-5	15-10	19-3	6-0	9-5	12-5	15-10-15-2	19-3-17-10
	Southern pine	#1	5-10-5-9	9-3-8-8	12-0-11-0	14-4-12-10	17-1-15-3	5-10-5-5	8-10-8-0	11-2-10-2	13-3-11-11	15-9-14-1
	Southern pine	#2	5-9-5-0	8-4-7-5	10-9-9-5	12-10-11-3	15-1-13-2	5-5-4-7	7-9-6-11	10-0-8-9	11-11-10-5	13-11-12-3
	Southern pine	#3	4-4-3-10	6-5-5-8	8-3-7-1	9-9-8-8	11-7-10-3	4-1-3-6	6-0-5-3	7-7-6-7	9-0-8-0	10-8-9-6
	Spruce-pine-fir	SS	5-8	8-10	11-8	14-8	17-1	5-8	8-10	11-2	13-7	15-9
	Spruce-pine-fir	#1	5-5	7-11	10-1	12-4	14-3	5-0	7-4	9-4	11-5	13-2
	Spruce-pine-fir	#2	5-5	7-11	10-1	12-4	14-3	5-0	7-4	9-4	11-5	13-2
	Spruce-pine-fir	#3	4-1	6-0	7-7	9-4	10-9	3-10	5-7	7-1	8-7	10-0

Check sources for availability of lumber in lengths greater than 20 feet.

SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

H_c/H_r	Rafter Span Adjustment Factor
1/3	0.67
1/4	0.76
1/5	0.83
1/6	0.90
1/7.5 or less	1.00

where:

H_c = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

H_r = Height of roof ridge measured vertically above the top of the rafter support walls.

TABLE R802.5.1(7)
RAFTER SPANS FOR 70 PSF GROUND SNOW LOAD
 (Ceiling not attached to rafters, L/Δ = 180)

RAFTER SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 × 4	2 × 6	2 × 8	2 × 10	2 × 12	2 × 4	2 × 6	2 × 8	2 × 10	2 × 12
			Maximum Rafter Spans ^a									
		(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	
12	Douglas fir-larch	SS	7-7	11-10	15-8	19-5	22-6	7-7	11-10	15-0	18-3	21-2
	Douglas fir-larch	#1	7-1	10-5	13-2	16-1	18-8	6-8	9-10	12-5	15-2	17-7
	Douglas fir-larch	#2	6-8	9-9	12-4	15-1	17-6	6-3	9-2	11-8	14-2	16-6
	Douglas fir-larch	#3	5-0	7-4	9-4	11-5	13-2	4-9	6-11	8-9	10-9	12-5
	Hem-fir	SS	7-2	11-3	14-9	18-10	22-1	7-2	11-3	14-8	18-0	20-10
	Hem-fir	#1	6-11	10-2	12-10	15-8	18-2	6-6	9-7	12-1	14-10	17-2
	Hem-fir	#2	6-7	9-7	12-2	14-10	17-3	6-2	9-1	11-5	14-0	16-3
	Hem-fir	#3	5-0	7-4	9-4	11-5	13-2	4-9	6-11	8-9	10-9	12-5
	Southern pine	SS	7-5	11-8	15-4	19-7	23-10-23-7	7-5	11-8	15-4	19-7-18-10	23-10-22-3
	Southern pine	#1	7-3-7-1	11-5-10-7	14-9-13-5	17-6-15-9	20-11-18-8	7-3-6-9	11-1-10-0	13-11-12-8	16-6-14-10	19-8-17-7
	Southern pine	#2	7-1-6-1	10-2-9-2	13-2-11-7	15-9-13-9	18-5-16-2	6-8-5-9	9-7-8-7	12-5-10-11	14-10-12-11	17-5-15-3
	Southern pine	#3	5-4-4-8	7-11-6-11	10-1-8-9	11-11-10-7	14-2-12-6	5-1-4-5	7-5-6-6	9-6-8-3	11-3-10-0	13-4-11-10
	Spruce-pine-fir	SS	7-0	11-0	14-6	18-0	20-11	7-0	11-0	13-11	17-0	19-8
	Spruce-pine-fir	#1	6-8	9-9	12-4	15-1	17-6	6-3	9-2	11-8	14-2	16-6
	Spruce-pine-fir	#2	6-8	9-9	12-4	15-1	17-6	6-3	9-2	11-8	14-2	16-6
Spruce-pine-fir	#3	5-0	7-4	9-4	11-5	13-2	4-9	6-11	8-9	10-9	12-5	
16	Douglas fir-larch	SS	6-10	10-9	13-9	16-10	19-6	6-10	10-3	13-0	15-10	18-4
	Douglas fir-larch	#1	6-2	9-0	11-5	13-11	16-2	5-10	8-6	10-9	13-2	15-3
	Douglas fir-larch	#2	5-9	8-5	10-8	13-1	15-2	5-5	7-11	10-1	12-4	14-3
	Douglas fir-larch	#3	4-4	6-4	8-1	9-10	11-5	4-1	6-0	7-7	9-4	10-9
	Hem-fir	SS	6-6	10-2	13-5	16-6	19-2	6-6	10-1	12-9	15-7	18-0
	Hem-fir	#1	6-0	8-9	11-2	13-7	15-9	5-8	8-3	10-6	12-10	14-10
	Hem-fir	#2	5-8	8-4	10-6	12-10	14-11	5-4	7-10	9-11	12-1	14-1
	Hem-fir	#3	4-4	6-4	8-1	9-10	11-5	4-1	6-0	7-7	9-4	10-9
	Southern pine	SS	6-9	10-7	14-0	17-10-17-4	21-8-20-5	6-9	10-7	14-0-13-9	17-10-16-4	21-0-19-3
	Southern pine	#1	6-7-6-2	10-2-9-2	12-9-11-8	15-2-13-8	18-1-16-2	6-5-5-10	9-7-8-8	12-0-11-0	14-4-12-10	17-1-15-3
	Southern pine	#2	6-2-5-3	8-10-7-11	11-5-10-0	13-7-11-11	16-0-14-0	5-10-5-0	8-4-7-5	10-9-9-5	12-10-11-3	15-1-13-2
	Southern pine	#3	4-8-4-1	6-10-6-0	8-9-7-7	10-4-9-2	12-3-10-10	4-4-3-10	6-5-5-8	8-3-7-1	9-9-8-8	11-7-10-3
	Spruce-pine-fir	SS	6-4	10-0	12-9	15-7	18-1	6-4	9-6	12-0	14-8	17-1
	Spruce-pine-fir	#1	5-9	8-5	10-8	13-1	15-2	5-5	7-11	10-1	12-4	14-3
	Spruce-pine-fir	#2	5-9	8-5	10-8	13-1	15-2	5-5	7-11	10-1	12-4	14-3
Spruce-pine-fir	#3	4-4	6-4	8-1	9-10	11-5	4-1	6-0	7-7	9-4	10-9	
19.2	Douglas fir-larch	SS	6-5	9-11	12-7	15-4	17-9	6-5	9-4	11-10	14-5	16-9
	Douglas fir-larch	#1	5-7	8-3	10-5	12-9	14-9	5-4	7-9	9-10	12-0	13-11
	Douglas fir-larch	#2	5-3	7-8	9-9	11-11	13-10	5-0	7-3	9-2	11-3	13-0
	Douglas fir-larch	#3	4-0	5-10	7-4	9-0	10-5	3-9	5-6	6-11	8-6	9-10
	Hem-fir	SS	6-1	9-7	12-4	15-1	17-4	6-1	9-2	11-8	14-2	15-5
	Hem-fir	#1	5-6	8-0	10-2	12-5	14-5	5-2	7-7	9-7	11-8	13-7
	Hem-fir	#2	5-2	7-7	9-7	11-9	13-7	4-11	7-2	9-1	11-1	12-10
Hem-fir	#3	4-0	5-10	7-4	9-0	10-5	3-9	5-6	6-11	8-6	9-10	

(continued)

TABLE R802.5.1(7)—continued
RAFTER SPANS FOR 70 PSF GROUND SNOW LOAD
 (Ceiling not attached to rafters, L/Δ = 180)

RAFTER SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 × 4	2 × 6	2 × 8	2 × 10	2 × 12	2 × 4	2 × 6	2 × 8	2 × 10	2 × 12
			Maximum Rafter Spans ^a									
		(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	(feet-inches)	
19.2	Southern pine	SS	6-4	10-0	13-2	16-9-15-10	20-4-18-8	6-4	10-0-9-10	13-2-12-6	16-5-14-11	19-2-17-7
	Southern pine	#1	6-3-5-8	9-3-8-5	11-8-10-8	13-10-12-5	16-6-14-9	5-11-5-4	8-9-7-11	11-0-10-0	13-1-11-9	15-7-13-11
	Southern pine	#2	5-7-4-10	8-1-7-3	10-5-9-2	12-5-10-10	14-7-12-9	5-4-4-6	7-7-6-10	9-10-8-8	11-9-10-3	13-9-12-1
	Southern pine	#3	4-3-3-8	6-3-5-6	8-0-6-11	9-5-8-4	11-2-9-11	4-0-3-6	5-11-5-2	7-6-6-6	8-10-7-11	10-7-9-4
	Spruce-pine-fir	SS	6-0	9-2	11-8	14-3	16-6	5-11	8-8	11-0	13-5	15-7
	Spruce-pine-fir	#1	5-3	7-8	9-9	11-11	13-10	5-0	7-3	9-2	11-3	13-0
	Spruce-pine-fir	#2	5-3	7-8	9-9	11-11	13-10	5-0	7-3	9-2	11-3	13-0
	Spruce-pine-fir	#3	4-0	5-10	7-4	9-0	10-5	3-9	5-6	6-11	8-6	9-10
24	Douglas fir-larch	SS	6-0	8-10	11-3	13-9	15-11	5-9	8-4	10-7	12-11	15-0
	Douglas fir-larch	#1	5-0	7-4	9-4	11-5	13-2	4-9	6-11	8-9	10-9	12-5
	Douglas fir-larch	#2	4-8	6-11	8-9	10-8	12-4	4-5	6-6	8-3	10-0	11-8
	Douglas fir-larch	#3	3-7	5-2	6-7	8-1	9-4	3-4	4-11	6-3	7-7	8-10
	Hem-fir	SS	5-8	8-8	11-0	13-6	13-11	5-7	8-3	10-5	12-4	12-4
	Hem-fir	#1	4-11	7-2	9-1	11-1	12-10	4-7	6-9	8-7	10-6	12-2
	Hem-fir	#2	4-8	6-9	8-7	10-6	12-2	4-4	6-5	8-1	9-11	11-6
	Hem-fir	#3	3-7	5-2	6-7	8-1	9-4	3-4	4-11	6-3	7-7	8-10
	Southern pine	SS	5-11	9-3	12-2-11-11	15-7-14-2	18-2-16-8	5-11	9-3-8-10	12-2-11-2	14-8-13-4	17-2-15-9
	Southern pine	#1	5-7-5-0	8-3-7-6	10-5-9-6	12-5-11-1	14-9-13-2	5-3-4-9	7-10-7-1	9-10-9-0	11-8-10-6	13-11-12-5
	Southern pine	#2	5-0-4-4	7-3-6-5	9-4-8-2	11-1-9-9	13-0-11-5	4-9-4-1	6-10-6-1	8-9-7-9	10-6-9-2	12-4-10-9
	Southern pine	#3	3-9-3-4	5-7-4-11	7-1-6-2	8-5-7-6	10-0-8-10	3-7-3-1	5-3-4-7	6-9-5-10	7-11-7-1	9-5-8-4
	Spruce-pine-fir	SS	5-6	8-3	10-5	12-9	14-9	5-4	7-9	9-10	12-0	12-11
	Spruce-pine-fir	#1	4-8	6-11	8-9	10-8	12-4	4-5	6-6	8-3	10-0	11-8
	Spruce-pine-fir	#2	4-8	6-11	8-9	10-8	12-4	4-5	6-6	8-3	10-0	11-8
	Spruce-pine-fir	#3	3-7	5-2	6-7	8-1	9-4	3-4	4-11	6-3	7-7	8-10

Check sources for availability of lumber in lengths greater than 20 feet.

SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

H_c/H_R	Rafter Span Adjustment Factor
1/3	0.67
1/4	0.76
1/5	0.83
1/6	0.90
1/7.5 or less	1.00

where:

= Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

= Height of roof ridge measured vertically above the top of the rafter support walls.

TABLE R802.5.1(8)
 RAFTER SPANS FOR 70 PSF GROUND SNOW LOAD
 (Ceiling attached to rafters, L/Δ = 240)

RAFTER SPACING (inches)	SPECIES AND GRADE	DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
		2 × 4	2 × 6	2 × 8	2 × 10	2 × 12	2 × 4	2 × 6	2 × 8	2 × 10	2 × 12
		Maximum rafter spans ^a									
		(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
12	Douglas fir-larch SS	6-10	10-9	14-3	18-2	22-1	6-10	10-9	14-3	18-2	21-2
	Douglas fir-larch #1	6-7	10-5	13-2	16-1	18-8	6-7	9-10	12-5	15-2	17-7
	Douglas fir-larch #2	6-6	9-9	12-4	15-1	17-6	6-3	9-2	11-8	14-2	16-6
	Douglas fir-larch #3	5-0	7-4	9-4	11-5	13-2	4-9	6-11	8-9	10-9	12-5
	Hem-fir SS	6-6	10-2	13-5	17-2	20-10	6-6	10-2	13-5	17-2	20-10
	Hem-fir #1	6-4	10-0	12-10	15-8	18-2	6-4	9-7	12-1	14-10	17-2
	Hem-fir #2	6-1	9-6	12-2	14-10	17-3	6-1	9-1	11-5	14-0	16-3
	Hem-fir #3	5-0	7-4	9-4	11-5	13-2	4-9	6-11	8-9	10-9	12-5
	Southern pine SS	6-9	10-7	14-0	17-10	21-8	6-9	10-7	14-0	17-10	21-8
	Southern pine #1	6-7-6-6	10-5-10-2	13-8-13-5	17-6-15-9	20-11-18-8	6-7-6-6	10-5-10-0	13-8-12-8	16-6-14-10	19-8-17-7
	Southern pine #2	6-6-6-1	10-2-9-2	13-2-11-7	15-9-13-9	18-5-16-2	6-6-5-9	9-7-8-7	12-5-10-11	14-10-12-11	17-5-15-3
	Southern pine #3	5-4-4-8	7-11-6-11	10-1-8-9	11-11-10-7	14-2-12-6	5-1-4-5	7-5-6-6	9-6-8-3	11-3-10-0	13-4-11-10
	Spruce-pine-fir SS	6-4	10-0	13-2	16-9	20-5	6-4	10-0	13-2	16-9	19-8
	Spruce-pine-fir #1	6-2	9-9	12-4	15-1	17-6	6-2	9-2	11-8	14-2	16-6
Spruce-pine-fir #2	6-2	9-9	12-4	15-1	17-6	6-2	9-2	11-8	14-2	16-6	
Spruce-pine-fir #3	5-0	7-4	9-4	11-5	13-2	4-9	6-11	8-9	10-9	12-5	
16	Douglas fir-larch SS	6-3	9-10	12-11	16-6	19-6	6-3	9-10	12-11	15-10	18-4
	Douglas fir-larch #1	6-0	9-0	11-5	13-11	16-2	5-10	8-6	10-9	13-2	15-3
	Douglas fir-larch #2	5-9	8-5	10-8	13-1	15-2	5-5	7-11	10-1	12-4	14-3
	Douglas fir-larch #3	4-4	6-4	8-1	9-10	11-5	4-1	6-0	7-7	9-4	10-9
	Hem-fir SS	5-11	9-3	12-2	15-7	18-11	5-11	9-3	12-2	15-7	18-0
	Hem-fir #1	5-9	8-9	11-2	13-7	15-9	5-8	8-3	10-6	12-10	14-10
	Hem-fir #2	5-6	8-4	10-6	12-10	14-11	5-4	7-10	9-11	12-1	14-1
	Hem-fir #3	4-4	6-4	8-1	9-10	11-5	4-1	6-0	7-7	9-4	10-9
	Southern pine SS	6-1	9-7	12-8	16-2	19-8	6-1	9-7	12-8	16-2	19-8-19-3
	Southern pine #1	6-0-5-11	9-5-9-2	12-5-11-8	15-2-13-8	18-1-16-2	6-0-5-10	9-5-8-8	12-0-11-0	14-4-12-10	17-1-15-3
	Southern pine #2	5-11-5-3	8-10-7-11	11-5-10-0	13-7-11-11	16-0-14-0	5-10-5-0	8-4-7-5	10-9-9-5	12-10-11-3	15-1-13-2
	Southern pine #3	4-8-4-1	6-10-6-0	8-9-7-7	10-4-9-2	12-3-10-10	4-4-3-10	6-5-5-8	8-3-7-1	9-9-8-8	11-7-10-3
	Spruce-pine-fir SS	5-9	9-1	11-11	15-3	18-1	5-9	9-1	11-11	14-8	17-1
	Spruce-pine-fir #1	5-8	8-5	10-8	13-1	15-2	5-5	7-11	10-1	12-4	14-3
Spruce-pine-fir #2	5-8	8-5	10-8	13-1	15-2	5-5	7-11	10-1	12-4	14-3	
Spruce-pine-fir #3	4-4	6-4	8-1	9-10	11-5	4-1	6-0	7-7	9-4	10-9	
19.2	Douglas fir-larch SS	5-10	9-3	12-2	15-4	17-9	5-10	9-3	11-10	14-5	16-9
	Douglas fir-larch #1	5-7	8-3	10-5	12-9	14-9	5-4	7-9	9-10	12-0	13-11
	Douglas fir-larch #2	5-3	7-8	9-9	11-11	13-10	5-0	7-3	9-2	11-3	13-0
	Douglas fir-larch #3	4-0	5-10	7-4	9-0	10-5	3-9	5-6	6-11	8-6	9-10
	Hem-fir SS	5-6	8-8	11-6	14-8	17-4	5-6	8-8	11-6	14-2	15-5
	Hem-fir #1	5-5	8-0	10-2	12-5	14-5	5-2	7-7	9-7	11-8	13-7
	Hem-fir #2	5-2	7-7	9-7	11-9	13-7	4-11	7-2	9-1	11-1	12-10
	Hem-fir #3	4-0	5-10	7-4	9-0	10-5	3-9	5-6	6-11	8-6	9-10

(continued)

TABLE R802.5.1(8)—continued
RAFTER SPANS FOR 70 PSF GROUND SNOW LOAD
(Ceiling attached to rafters, L/Δ = 240)

RAFTER SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 × 4	2 × 6	2 × 8	2 × 10	2 × 12	2 × 4	2 × 6	2 × 8	2 × 10	2 × 12
			Maximum rafter spans ^a									
		(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	
19.2	Southern pine	SS	5-9	9-1	11-11	15-3	18-6	5-9	9-1	11-11	15-3-14-11	18-6-17-7
	Southern pine	#1	5-8-5-6	8-11-8-5	11-8-10-8	13-10-12-5	16-6-14-9	5-8-5-4	8-9-7-11	11-0-10-0	13-1-11-9	15-7-13-11
	Southern pine	#2	5-6-4-10	8-1-7-3	10-5-9-2	12-5-10-10	14-7-12-9	5-4-4-6	7-7-6-10	9-10-8-8	11-9-10-3	13-9-12-1
	Southern pine	#3	4-3-3-8	6-3-5-6	8-0-6-11	9-5-8-4	11-2-9-11	4-0-3-6	5-11-5-2	7-6-6-6	8-10-7-11	10-7-9-4
	Spruce-pine-fir	SS	5-5	8-6	11-3	14-3	16-6	5-5	8-6	11-0	13-5	15-7
	Spruce-pine-fir	#1	5-3	7-8	9-9	11-11	13-10	5-0	7-3	9-2	11-3	13-0
	Spruce-pine-fir	#2	5-3	7-8	9-9	11-11	13-10	5-0	7-3	9-2	11-3	13-0
	Spruce-pine-fir	#3	4-0	5-10	7-4	9-0	10-5	3-9	5-6	6-11	8-6	9-10
24	Douglas fir-larch	SS	5-5	8-7	11-3	13-9	15-11	5-5	8-4	10-7	12-11	15-0
	Douglas fir-larch	#1	5-0	7-4	9-4	11-5	13-2	4-9	6-11	8-9	10-9	12-5
	Douglas fir-larch	#2	4-8	6-11	8-9	10-8	12-4	4-5	6-6	8-3	10-0	11-8
	Douglas fir-larch	#3	3-7	5-2	6-7	8-1	9-4	3-4	4-11	6-3	7-7	8-10
	Hem-fir	SS	5-2	8-1	10-8	13-6	13-11	5-2	8-1	10-5	12-4	12-4
	Hem-fir	#1	4-11	7-2	9-1	11-1	12-10	4-7	6-9	8-7	10-6	12-2
	Hem-fir	#2	4-8	6-9	8-7	10-6	12-2	4-4	6-5	8-1	9-11	11-6
	Hem-fir	#3	3-7	5-2	6-7	8-1	9-4	3-4	4-11	6-3	7-7	8-10
	Southern pine	SS	5-4	8-5	11-1	14-2	17-2-16-8	5-4	8-5	11-1	14-2-13-4	17-2-15-9
	Southern pine	#1	5-3-5-0	8-3-7-6	10-5-9-6	12-5-11-1	14-9-13-2	5-3-4-9	7-10-7-1	9-10-9-0	11-8-10-6	13-11-12-5
	Southern pine	#2	5-0-4-4	7-3-6-5	9-4-8-2	11-1-9-9	13-0-11-5	4-9-4-1	6-10-6-1	8-9-7-9	10-6-9-2	12-4-10-9
	Southern pine	#3	3-9-3-4	5-7-4-11	7-1-6-2	8-5-7-6	10-0-8-10	3-7-3-1	5-3-4-7	6-9-5-10	7-11-7-1	9-5-8-4
	Spruce-pine-fir	SS	5-0	7-11	10-5	12-9	14-9	5-0	7-9	9-10	12-0	12-11
	Spruce-pine-fir	#1	4-8	6-11	8-9	10-8	12-4	4-5	6-6	8-3	10-0	11-8
	Spruce-pine-fir	#2	4-8	6-11	8-9	10-8	12-4	4-5	6-6	8-3	10-0	11-8
	Spruce-pine-fir	#3	3-7	5-2	6-7	8-1	9-4	3-4	4-11	6-3	7-7	8-10

Check sources for availability of lumber in lengths greater than 20 feet.

SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

The tabulated rafter spans assume that ceiling joists are located at the bottom of the attic space or that some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties, is provided at that location. When ceiling joists or rafter ties are located higher in the attic space, the rafter spans shall be multiplied by the factors given below:

H_c/H_r	Rafter Span Adjustment Factor
1/3	0.67
1/4	0.76
1/5	0.83
1/6	0.90
1/10 or less	1.00

where:

H_c = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

H_r = Height of roof ridge measured vertically above the top of the rafter support walls.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Mike Toalson-Randy Melvin

Representing: HBA of Virginia

Mailing Address: 707 East Franklin Street, Richmond, VA 23219

Email Address: mltoalson@hbav.com
randy.melvin@whihomes.com

Telephone Number: 804 643 2797
410 365 7781

Proposal Information

Code(s) and Section(s): IRC Section Number: 2012 IPC Section Number: 607.2 Hot or tempered water supply to fixtures

Proposed Change (including all relevant section numbers, if multiple sections):

Modify the section as shown below:

607.2 Hot or tempered water supply to fixtures.

~~The developed length of hot or tempered water piping, from the source of hot water to the fixtures that require hot or tempered water, shall not exceed 50 feet (15 240 mm).~~ Recirculating system piping and heat-traced piping shall be considered to be sources of hot or tempered water.

607.2.3 Hot water supply temperature maintenance. Where the developed length of hot water piping from the source of hot water supply to the farthest fixture exceeds 100 feet (15 240 to 30 480mm), the piping from the source of hot water supply to all fixtures exceeding 100 feet (15 240mm) in developed length shall be insulated to a minimum of R-3.

Supporting Statement (including intent, need, and cost impact of the proposal):

Reason: There is no life cycle or other analysis to justify the limited amount of water lost in purging 50' lines of cool water before the hot water arrives will ever, yet alone under typical real world water use patterns with a reasonable payback period, offset the additional natural and human resources required to manufacture, deliver, install, maintain and periodically replace the addition of a second water heater.

The amendment maintains the 100' requirement for adding pipe insulation from the 2009 IPC.

Submittal Information

Date Submitted: March 5, 2013

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information (Check one): Individual Government Entity Company

Name: Robby Dawson Representing: Fire Services Board Code Committee

Mailing Address: 1005 Technology Park Drive, Glen Allen, VA 23059

Email Address: dawsonj@chesterfield.gov Telephone Number: 804-748-1426

Proposal Information

Code(s) and Section(s): Statewide Fire Prevention Code – various sections as listed below

Proposed Change (including all relevant section numbers, if multiple sections):

103.2. Amendments. All requirements of the referenced codes and standards that relate to fees, permits, unsafe notices, disputes, condemnation, inspections, scope of enforcement and all other procedural, and administrative matters are deleted and replaced by the provisions of Chapter 1 of the SFPC.

107.2 Permits Required. Operational Permits may be required by the fire official as permitted under the SFPC in accordance with Table 107.2, except that the fire official shall require permits for the manufacturing, storage, handling, use and sale of explosives. (remainder of section unchanged)

**Table 107.2
Operational Permit Requirements (to be filled in by local jurisdiction)**

Description	Permit Required (yes or no)	Permit Fee	Inspection Fee		
Battery systems. A permit is required to install stationary lead-acid battery systems having a liquid capacity of more than 50 gallons (189 L).					
<p>Compressed gas. An operational permit is required for the storage, use or handling at normal temperature and pressure (NTP) of compressed gases in excess of the amounts listed below.</p> <p>Exception: Vehicles equipped for and using compressed gas as a fuel for propelling the vehicle.</p> <p style="text-align: center;">PERMIT AMOUNTS FOR COMPRESSED GASES</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">TYPE OF GAS</td> <td style="width: 50%;">AMOUNT (cubic feet at NTP)</td> </tr> </table>	TYPE OF GAS	AMOUNT (cubic feet at NTP)			
TYPE OF GAS	AMOUNT (cubic feet at NTP)				

Corrosive	200			
Flammable (except cryogenic fluids and liquefied petroleum gases)	200			
Highly toxic	Any amount			
Inert and simple asphyxiant	6,000			
Oxidizing (including oxygen)	504			
Pyrophoric	<u>Any amount</u>			
Toxic	Any amount			
<i>For SI: 1 cubic foot = 0.02832 m³</i>				
Covered and open mall buildings. An operational permit is required for: 1. The placement of retail fixtures and displays, concession equipment, displays of highly combustible goods and similar items in the mall. 2. The display of liquid- or gas-fired equipment in the mall. 3. The use of open-flame or flame-producing equipment in the mall.				
LP-gas. An operational permit is required for: 1. Storage and use of LP-gas. Exception: A permit is not required for individual containers with a 500-gallon (1893 L) water capacity or less <u>or multiple container systems having an aggregate quantity not exceeding 500 gallons (1893 L), serving occupancies in Group R-3.</u> 2. Operation of cargo tankers that transport LP-gas.				
Cryogenic fluids. An operational permit is required to produce, store, transport on site, use, handle or dispense cryogenic fluids in excess of the amounts listed below. Exception: Operational permits are not required for vehicles equipped for and using cryogenic fluids as a fuel for propelling the vehicle or for refrigerating the lading.				
Explosives, fireworks and pyrotechnics. An operational permit is required for the manufacture, storage, handling, sale or use of any quantity of explosive, explosive materials, fireworks, or pyrotechnic special effects, <u>or pyrotechnic special effects material</u> within the scope of Chapter 3356. Exception: <u>Storage in Group R-3 or R-5 occupancies of smokeless propellant, black powder and small arms primers for personal use, not for resale and in accordance with the quantity limitations and conditions set forth in Section 5601.1, exceptions 4 and 12.</u>				
Type of Cryogenic Fluid	Inside Building (gallons)	Outside Building (gallons)		
Flammable	More than 1	60		
Inert	60	500		
Oxidizing (includes oxygen)	10	50		
Physical or health hazard not indicated above	Any amount	Any amount		
<i>For SI: 1 gallon = 3.785 L</i>				
Fumigation, and thermal and insecticidal fogging. An operational permit is required to operate a business of fumigation, or thermal or insecticidal fogging and to maintain a room, vault or chamber in which a toxic or flammable fumigant is used.				
Hazardous materials. An operational permit is required to store, transport on site, dispense, use or handle hazardous materials in excess of the following amounts:				
Type of material	Amount			
Combustible liquids	See Flammable and Combustible Liquids			
Corrosive materials	See Compressed Gases			
Gases	55 gallons			
Liquids	1000 pounds			
Solids				
Explosive materials	See Explosives			
Flammable materials	See Compressed Gases			
Gases	See Flammable and Combustible Liquids			
Liquids	100 pounds			
Solids				

Highly toxic materials Gases Liquids Solids	See Compressed Gases Any amount Any amount			
Oxidizing materials Gases Liquids Class 4 Class 3 Class 2 Class 1 Solids Class 4 Class 3 Class 2 Class 1	See Compressed Gases Any amount 1 gallon ^a 10 gallons 55 gallons Any amount 10 pounds ^b 100 pounds 500 pounds			
Organic peroxides Liquids Class I Class II Class III Class IV Class V Solids Class I Class II Class III Class IV Class V	Any amount Any amount 1 gallon 2 gallons No permit required Any amount Any amount 10 pounds 20 pounds No permit required			
Pyrophoric materials Gases Liquids Solids	See Compressed Gases Any amount Any amount			
Toxic materials Gases Liquids Solids	See Compressed Gases 10 gallons 100 pounds			
Unstable (reactive) materials Liquids Class 4 Class 3 Class 2 Class 1 Solids Class 4 Class 3 Class 2 Class 1	Any amount Any amount 5 gallons 10 gallons Any amount Any amount 50 pounds 100 pounds			
Water-reactive Materials Liquids Class 3 Class 2 Class 1 Solids Class 3 Class 2 Class 1	Any amount 5 gallons 55 gallons Any amount 50 pounds 500 pounds			
<p>a. 20 gallons when Table 5003.1.1(1) Note k applies and hazard identification signs in accordance with Section 5003.5 are provided for quantities of 20 gallons or less.</p> <p>b. 20 pounds when Table 5003.1.1(1) Note k applies and hazard identification signs in accordance with Section 5003.5 are provided for quantities of 200 pounds or less.</p>				
<p>Open flames and candles. An operational permit is required to remove paint with a torch; use a torch or open flame device in a hazardous fire area; or to use open</p>				

flames or candles in connection with assembly areas, dining areas of restaurants or drinking establishments.			
Open flames and torches. An operational permit is required to remove paint with a torch; or to use a torch or open-flame device in a wildfire risk area.			
Places of Assembly/educational. An operational permit is required to operate a place of assembly/educational occupancy.			
For SI: 1 cubic foot = 0.02832 m ³ . 1 gallon = 3.785 L. 1 pound = 0.454 kg.			

301.2 Permits. Permits shall be required as set forth in Section ~~105.6~~107.2 for the activities or uses regulated by Sections 306, 307, 308 and 315.

307.2 Permit required. A permit shall be obtained from the *fire code official* in accordance with Section ~~105.6~~107.2 prior to kindling a fire for recognized silvicultural or range or wildlife management practices, prevention or control of disease or pests, or a bonfire. Application for such approval shall only be presented by and permits issued to the *owner* of the land upon which the fire is to be kindled.

308.2 Permits required. Permits shall be obtained from the *fire code official* in accordance with Section ~~105.6~~107.2 prior to engaging in the following activities involving open flame, fire and burning:

1. Use of a torch or flame-producing device to remove paint from a structure.
2. Use of open flame, fire or burning in connection with Group A or E occupancies.
3. Use or operation of torches and other devices, machines or processes liable to start or cause fire in or upon wildfire risk areas.

315.2 Permit required. A permit for miscellaneous combustible storage shall be required as set forth in Section ~~105.6~~107.2.

501.2 Permits. A permit shall be required as set forth in Sections ~~105.6~~107.2 and ~~105.7~~.

601.2 Permits. Permits shall be obtained for refrigeration systems, battery systems and solar photovoltaic power systems as set forth in Sections ~~105.6~~107.2 and ~~105.7~~.

901.2 Construction documents. The *fire code official* shall have the authority to require and receive copies of construction documents and calculations for all *fire protection systems* where such documents exist. ~~and to require permits be issued for the installation, rehabilitation or modification of any fire protection system to be installed, rehabilitated or modified.~~ Construction documents for *fire protection systems* shall be submitted for review and approval prior to system installation.

901.3 Permits. Permits shall be required as set forth in Sections ~~105.6~~107.2 and ~~105.7~~.

2001.3 Permits. For permits to operate aircraft-refueling vehicles, application of flammable or combustible finishes and hot work, see Section ~~105.6~~107.2.

2101.2 Permit required. Permits shall be required as set forth in Section ~~105.6~~107.2.

2201.2 Permits. Permits shall be required for *combustible dust*-producing operations as set forth in Section ~~105.6~~107.2.

2301.2 Permits. Permits shall be required as set forth in Section ~~105.6~~107.2.

2401.3 Permits. Permits shall be required as set forth in Sections ~~105.6~~107.2 and ~~105.7~~.

2501.2 Permits. Permits shall be required as set forth in Section ~~105.6~~107.2.

2601.2 Permits. Permits shall be required as set forth in Section ~~105.6~~107.2.

2701.5 Permits. Permits shall be required as set forth in Section ~~105.6~~107.2.

2801.2 Permit. Permits shall be required as set forth in Section ~~105.6~~107.2.

2901.2 Permits. Permits shall be required as set forth in Section ~~105.6~~107.2.

3001.2 Permits. Permits shall be required as set forth in Sections ~~105.6~~107.2 and ~~105.7~~.

- 3103.4 Permits.** Permits shall be required as set forth in Sections ~~105.6~~107.2 and ~~105.7~~.
- 3201.2 Permits.** A permit shall be required as set forth in Section ~~105.6~~107.2.
- 3401.2 Permit required.** Permits shall be required as set forth in Section ~~105.6~~107.2.
- 5001.5 Permits.** Permits shall be required as set forth in Sections ~~105.6~~107.2 and ~~105.7~~.
- 5101.2 Permit required.** Permits shall be required as set forth in Section ~~105.6~~107.2.
- 5201.3 Permits.** Permits shall be required as set forth in Section ~~105.6~~107.2.
- 5301.2 Permits.** Permits shall be required as set forth in Section ~~105.6~~107.2.
- 5401.2 Permits.** Permits shall be required as set forth in Section ~~105.6~~107.2.
- 5501.2 Permits.** Permits shall be required as set forth in Section ~~105.6~~107.2.
- 5601.2 Permit required.** Permits shall be required as set forth in Section ~~105.6~~107.2 and regulated in accordance with this section.
- 5701.4 Permits.** Permits shall be required as set forth in Sections ~~105.6~~107.2 and ~~105.7~~.
- 5801.2 Permits.** Permits shall be required as set forth in Section ~~105.6~~107.2.
- 5901.2 Permits.** Permits shall be required as set forth in Section ~~105.6~~107.2.
- 6001.2 Permits.** Permits shall be required as set forth in Section ~~105.6~~107.2.
- 6201.2 Permits.** Permits shall be required for organic peroxides as set forth in Section ~~105.6~~107.2.
- 6301.2 Permits.** Permits shall be required as set forth in Section ~~105.6~~107.2.
- 6401.2 Permits.** Permits shall be required as set forth in Section ~~105.6~~107.2.
- 6501.2 Permits.** Permits shall be required as set forth in Section ~~105.6~~107.2.
- 6601.2 Permits.** Permits shall be required as set forth in Section ~~105.6~~107.2.

Supporting Statement (including intent, need, and impact of the proposal):

NOTE: This original change was proposed by the FSBCC 12/5/2012. This revision reflects comments and clarifications requested by members of the BHCD Codes and Standards Committee. This revision's changes are noted by highlighted areas in the text of the proposal.

The overall objective for this proposed change is to ensure the proper and accurate coordination of the code's permit provisions and to clearly identify how reference standards are to be applied and when.

1. Section 103.2 amends by eliminating "permits" and "scope of enforcement" from this section. The corrected sections of the SFPC now correctly identify what section of the SFPC (107.2) identifies which operational permits are required. If the term "permits" remains, confusion is created that the permitting requirements in the explosives chapter are not enforceable. But with the proper reference to 107.2, it becomes clear that not only are permits potentially required, they are referenced back to the proper administrative provisions of chapter 1.

The "scope of enforcement" is also removed to clearly indicate those referenced standards (like NFPA) do have limitations on their scope. Without the deletion of this section, one could argue the door is left wide open to take the standard out of context or there is no basis for the standard to be used. The SFPC already has a catch all provision in 102.4 that clearly states any conflict between the SFPC and a reference standard – such as differences in scope –

that the SFPC prevails.

2. References to the permit section of Chapter 1 are often encountered in the technical chapters of the code. When encountered in a technical chapter, this proposed change will provide for the proper and accurate reference of the Chapter 1 permit provisions.
3. The changes to Table 107.2 are intended to incorporate the changes found in the 2012 edition of the IFC with the following notable differences:
 - a. An operational permit requirement for battery systems was deleted from the IFC in October 2004 through action by the ICC Code Correlation Committee (CCC). The stated reason for the CCC action was,

"Section 105.6.5 is the only section in 105.6 that contains the word "install", which clearly indicates that the permit requirement is one of construction, not operation.

Section 105.6.5 was added to the code by code change F203-99 (AM). It originally said "...install or operate..." but the modification deleted the phrase "...or operate...". At that time, there was only one section, 105.6, that regulated all permits.

In the same code change cycle, code change F46-99 (AM) divided Section 105.6 into the current separate Required Operational Permits Section 105.6 and Required Construction Permits Section 105.7.

Since both code changes F46-99 and F203-99 were approved simultaneously, relocating the new construction-oriented permit requirements created by F203-99 for the installation of battery systems from Section 105.6 to the new Section 105.7 should have been accomplished as a correlation change prior to publication of the 2000 edition, however it was overlooked. This correlation change will place the permit requirement for installation of battery systems into the proper section."

(The ICC references to Section 105.6 equate to SFPC Section 107.2.)
 - b. For fumigation, thermal and insecticidal fogging, the model code deleted the reference to "thermal" treatment but its felt this treatment must be retained. To produce high temperatures (thermal) within a building or space may still be a viable method for treating bed bug infestations. One of the methods of thermal pest control is the use of propane. If propane is used to treat bed bug infestations, then a permit may have to be obtained through or coordinated with other chapters of the code such as Chapter 61, Liquefied Petroleum Gas. The changes shown are for the benefit of clarity and distinction for the 3 methods of treatment; fumigation, thermal and fogging.
 - c. The SI units of measurement are relocated to the end of the table as opposed to repeating them in multiple locations. The units of measurement would still be applicable throughout the table.
 - d. Through an omission, the '09 edition of the SFPC did not have notes "a" and "b" as they relate to liquid and solid oxidizing hazardous materials. This change properly puts those notes back into the table.
 - e. As a statewide minimum, the added language regarding explosives, display fireworks and pyrotechnics reflects the combining of separate IFC model code lines and its list of required operational permits. This produces no fundamental or significant operational changes within or for the SFPC and **does not** impact "permissible fireworks".
 - f. The exception for the line for explosives is a reiteration for propellants and primers found in Chapter 56 and those contained in previous editions of the SFPC. There's no attempt to change those SFPC exceptions.
 - g. As a point of information, no edition of the referenced IFC model code has had educational occupancy listed for operational permits, hence the reason for deleting the reference for educational occupancies. The option to amend the code to include Group E is still available at the local level.
4. The change to Section 901.2 allows the fire official to require and receive copies of construction documents related to the installation, rehabilitation or modification of fire protections systems. It is those documents that establish the benchmark for which a level protection or performance is to be maintain for the life of the building and its systems.
5. Additional supporting information submitted 5/2013 in support of 103.2 changes:

Further analysis of the specific sections of the referenced codes and standards reveals that the following inspections are not required, nor can the owner/operator be compelled to conduct any inspections under the SFPC:

 - a. Fire hydrants to can not be inspected (507.5.2)
 - b. There can be no required inspection of emergency or standby power systems, and no records maintained (604.3). These requirements are in the IFC and NFPA 110, 111 – both are deleted by existing language.

- c. Commercial kitchen hoods including ducts and fans can no longer be required to be inspected. (609.3.3.1).
- d. Portable fire extinguishers are not required to be inspected, however the exception may now be required since issues dealing with "inspections" is not in the SFPC, so the exception is not included (906.2 Ex 2).
- e. The inspection of "fire detection, alarm and extinguishing system" as well as non-required systems are not required to be inspected (901.6).
- f. Fire resistance rated construction does not need to be inspected by the owner of the property (703.1).
- g. Records can no long be "inspected" concerning the monitoring for excessive temperatures in dust piles (1908.6).
- h. Shells of pyrotechnic devices do not need to be inspected for damage after transport (3308.5.3)
- i. Magazines of explosive do not have to be routinely inspected for damaged, degrading or missing explosives (3304.9).
- j. Records of explosives transactions can not be inspected (3303.2).
- k. There is no requirement to inspect the fallout area of a fireworks display to collect any un-exploded shells (3308.9).

The Scoping provisions of the referenced NFPA Standards do not apply as 103.2 is currently written. Additionally, since the scope of NFPA 25 is effectively deleted, the exception is also eliminated making NFPA 25 applicable to ALL water based fire protection systems including NFPA13D systems.

Opposition to much of the change to this section has not been objectively illustrated. There have been no examples (like those listed above to the contrary) that show how the proposed change has a detrimental impact on the fire official's ability to enforce the code or any potential expansion of what was understood scope prior to the TRB ruling earlier this year.

Modification to section 906.2 clarifies this is not directed at the building official, but whoever has possession of these documents to ensure they are available for future fire code enforcement.

6. The change to section 107.2 clarifies that these permits are operational in nature and do not allow or require the fire official to issue permits under any other provision of state code other than the SFPC for the operations noted in Table 107.2 when adopted locally as part of the local fire code adoption process.

Supporting documentation of the referenced adopted standards are also attached to this revised proposal.

Submittal Information

Date Submitted: 12/5/12 – Revision submitted 6/3/13

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



NFPA 25

Standard for the

Inspection, Testing, and Maintenance of
Water-Based Fire Protection Systems

2002 Edition

NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

Changes other than editorial are indicated by a vertical rule beside the paragraph, table, or figure in which the change occurred. These rules are included as an aid to the user in identifying changes from the previous edition. Where one or more complete paragraphs have been deleted, the deletion is indicated by a bullet between the paragraphs that remain.

A reference in brackets [] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, Annex D lists the complete title and edition of the source documents for both mandatory and nonmandatory extracts. Editorial changes to extracted material consist of revising references to an appropriate division in this document or the inclusion of the document number with the division number when the reference is to the original document. Requests for interpretations or revisions of extracted text shall be sent to the appropriate technical committee.

Information on referenced publications can be found in Chapter 2 and Annex D.

Chapter 1 Administration

1.1 Scope. This document establishes the minimum requirements for the periodic inspection, testing, and maintenance of water-based fire protection systems, including land-based and marine applications. The types of systems addressed by this standard include, but are not limited to, sprinkler, stand-pipe and hose, fixed water spray, and foam water. Included are the water supplies that are part of these systems, such as private fire service mains and appurtenances, fire pumps and water storage tanks, and valves that control system flow. The document also addresses impairment handling and reporting. This standard applies to fire protection systems that have been properly installed in accordance with generally accepted practices. Where a system has not been installed in accordance with generally accepted practices, the corrective action is beyond the scope of this standard. The corrective action to ensure that the system performs in a satisfactory manner shall be in accordance with the appropriate installation standard.

1.1.1 This standard shall not apply to sprinkler systems designed and installed in accordance with NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes*.

1.2* Purpose. The purpose of this document is to provide requirements that ensure a reasonable degree of protection for life and property from fire through minimum inspection, testing, and maintenance methods for water-based fire protection systems. In those cases where it is determined that an

existing situation involves a distinct hazard to life or property, the authority having jurisdiction shall be permitted to require inspection, testing, and maintenance methods in excess of those required by the standard.

1.3* Application. It is not the intent of this document to limit or restrict the use of other inspection, testing, or maintenance programs that provide an equivalent level of system integrity and performance to that detailed in this document. The authority having jurisdiction shall be consulted and approval obtained for such alternative programs.

1.4* Units. Metric units of measurement in this standard are in accordance with the modernized metric system known as the International System of Units (SI).

1.4.1 If a value for measurement as given in this standard is followed by an equivalent value in other units, the first stated shall be regarded as the requirement. A given equivalent value shall be considered to be approximate.

1.4.2 SI units have been converted by multiplying the quantity by the conversion factor and then rounding the result to the appropriate number of significant digits. Where nominal or trade sizes exist, the nominal dimension has been recognized in each unit.

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

NFPA 11, *Standard for Low-Expansion Foam*, 1998 edition.

NFPA 13, *Standard for the Installation of Sprinkler Systems*, 1999 edition.

NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes*, 1999 edition.

NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*, 2001 edition.

NFPA 16, *Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems*, 1999 edition.

NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection*, 1999 edition.

NFPA 22, *Standard for Water Tanks for Private Fire Protection*, 1998 edition.

NFPA 72®, *National Fire Alarm Code*®, 1999 edition.

NFPA 110, *Standard for Emergency and Standby Power Systems*, 2002 edition.

NFPA 307, *Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves*, 2000 edition.

NFPA 409, *Standard on Aircraft Hangars*, 2001 edition.

NFPA 1962, *Standard for the Care, Use, and Service Testing of Fire Hose Including Couplings and Nozzles*, 1998 edition.

2.3 Other Publications.

2.3.1 ASTM Publication. American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM D 3359, *Standard Test Methods for Measuring Adhesion by Tape Test*, 1997.

10.2 Plans. Where plans are required, they shall be prepared by qualified persons trained in the design and application of these systems.

10.2.1 The plans shall be drawn to an indicated scale or be suitably dimensioned and shall be reproducible.

10.2.2 The plans shall contain sufficient detail to enable the authority having jurisdiction to evaluate the hazard or hazards and to evaluate the effectiveness of the system.

10.2.2.1 The details on the hazards shall include the materials involved, the location and arrangement, and the exposure to the hazard.

10.2.3 The details on the system shall include sufficient information and calculations on the following:

- (1) Amount of dry chemical
- (2) The size, length, and arrangement of connected piping, or piping and hose
- (3) The description and location of nozzles so that the adequacy of the system can be determined

10.2.3.1 Flow rates of nozzles used shall be provided for engineered systems.

10.2.3.2 Information shall be submitted pertaining to the location and function of detection devices, operating devices, auxiliary equipment, and electrical circuitry, if used.

10.2.3.3 Sufficient information shall be indicated to properly identify the apparatus and devices used.

10.3 Approval of Plans. Where plans are required, they shall be submitted to the authority having jurisdiction for approval before work starts.

10.3.1 Where field conditions necessitate any substantial change from the approved plan, the corrected as-installed plans shall be submitted to the authority having jurisdiction for approval.

10.4 Approval of Installations. The completed system shall be tested by qualified personnel.

10.4.1 The tests shall determine that the system has been properly installed and will function as intended.

10.4.1.1 Only listed equipment and devices shall be used in these systems.

10.4.2 The installer shall certify that the installation has been made in accordance with the approved plans and the listing of a testing laboratory.

10.4.3 Acceptance tests shall include a discharge of dry chemical in sufficient amounts to verify that the system is properly installed and functional.

10.4.3.1 The method of verification shall be acceptable to the authority having jurisdiction.

10.4.3.2 Piping shall not be hydrostatically tested.

10.4.3.3 Where pressure testing is required, it shall be by means of a dry gas.

10.4.3.4 The labeling of devices with proper designations and instructions shall be checked.

10.4.3.5 The use of dry chemical for the approval test shall be permitted to be waived by the authority having jurisdiction.

10.4.4 After any discharge of dry chemical, all piping and nozzles shall be blown clean using compressed dry air or nitrogen.

10.4.4.1 The system shall be properly charged and placed in the normal "set" condition.

10.5 Manual. The owner shall be provided with a copy of the manufacturer's listed installation and maintenance manual or listed owner's manual.

Chapter 11 Inspection, Maintenance, and Recharging

11.1 General Requirements.

11.1.1 Where dry chemical pressure containers are not attached to piping or hand hose lines, the discharge outlet shall be provided with a protective diffusing safety cap to protect personnel from recoil and high-flow discharge in case of accidental actuation.

11.1.1.1 Protective caps also shall be used on empty pressure containers to protect threads.

11.1.1.2 Protective caps shall be provided by the manufacturer of the equipment.

11.1.2 Storage. Storage of charging supplies of dry chemical shall be in a constantly dry area, and the dry chemical shall be contained in metal drums or other containers that will prevent the entrance of moisture even in small quantities.

11.1.2.1 Prior to the dry chemical chamber being charged, the dry chemical shall be checked carefully to determine that it is in a flowing condition.

11.1.3* A trained person who has undergone the instructions necessary to perform the maintenance and recharge service reliably and has the applicable manufacturer's installation and maintenance manual and service bulletins shall service the dry chemical extinguishing system at intervals not more than 6 months apart as outlined in Section 11.3.

11.1.4 All dry chemical extinguishing systems shall be inspected in accordance with the owner's manual and maintained and recharged in accordance with the manufacturer's listed installation and maintenance manual and service bulletins.

11.1.5 Recharge Agents.

11.1.5.1 Quality. The dry chemical used in the system shall be supplied by the equipment manufacturer.

11.1.5.1.1 The characteristics of the system are dependent on the composition of the dry chemical and the type of expellant gas, as well as other factors.

11.1.5.1.2 It is imperative to use the dry chemical provided by the equipment manufacturer and the type of expellant gas specified by the equipment manufacturer.

11.1.5.1.3 Where carbon dioxide or nitrogen is used as the expellant gas, it shall be of good commercial grade and free of water and other contaminants that might cause container corrosion.

11.1.6 System access for inspection or maintenance that requires opening panels in fire chases or ducts, or both, shall not be permitted while any appliance(s) or equipment protected by that system is in operation.

11.2 Owner's Inspection.

11.2.1 On a monthly basis, inspection shall be conducted in accordance with the manufacturer's listed installation and maintenance manual or owner's manual.

11.2.1.1 As a minimum, this "quick check" or inspection shall include verification of the following:

- (1) The extinguishing system is in its proper location.
- (2) The manual actuators are unobstructed.
- (3) The tamper indicators and seals are intact.
- (4) The maintenance tag or certificate is in place.
- (5) The system shows no physical damage or condition that might prevent operation.
- (6) The pressure gauge(s), if provided, is in operable range.
- (7) The nozzle blowoff caps, where provided, are intact and undamaged.
- (8) Neither the protected equipment nor the hazard has been replaced, modified, or relocated.

11.2.2 If any deficiencies are found, appropriate corrective action shall be taken immediately.

11.2.3 Personnel making inspections shall keep records for those extinguishing systems that were found to require corrective actions.

11.2.4 At least monthly, the date the inspection is performed and the initials of the person performing the inspection shall be recorded. The records shall be retained until the next semi-annual maintenance.

11.3 Maintenance.

11.3.1* At least semiannually, maintenance shall be conducted in accordance with the manufacturer's listed installation and maintenance manual.

11.3.1.1 As a minimum, such maintenance shall include the following:

- (1) A check to see that the hazard has not changed
- (2) An examination of all detectors, expellant gas container(s), agent container(s), releasing devices, piping, hose assemblies, nozzles, signals, and all auxiliary equipment
- (3)*Verification that the agent distribution piping is not obstructed
- (4) Examination of the dry chemical (If there is evidence of caking, the dry chemical shall be discarded and the system shall be recharged in accordance with the manufacturer's instructions.)

11.3.1.2 Dry chemical in stored pressure systems shall not require semiannual examination but shall be examined at least every 6 years.

11.3.1.3 Where semiannual maintenance of any dry chemical containers or system components reveals conditions such as, but not limited to, corrosion or pitting in excess of the manufacturer's limits, structural damage or fire damage, or repairs by soldering, welding, or brazing, the affected part(s) shall be replaced or hydrostatically tested in accordance with the recommendations of the manufacturer or the listing agency. The hydrostatic testing of dry chemical containers shall follow the applicable procedures outlined in Section 11.5.

11.3.1.4* All dry chemical systems shall be tested, which shall include the operation of the detection system, signals, and releasing devices, including manual stations and other associated equipment.

11.3.1.5 Where the maintenance of the system(s) reveals defective parts that could cause an impairment or failure of proper operation of the system(s), the affected parts shall be replaced or repaired in accordance with the manufacturer's recommendations.

11.3.1.6 The maintenance report, including any recommendations, shall be filed with the owner or with the designated party responsible for the system.

11.3.1.7* Each dry chemical system shall have a tag or label indicating the month and year the maintenance is performed and identifying the person performing the service. Only the current tag or label shall remain in place.

11.3.2* Fixed temperature-sensing elements of the fusible metal alloy type shall be replaced at least annually from the date of installation.

11.3.2.1 Upon removal the links shall be destroyed.

11.3.2.2 The year of manufacture and the date of installation of the fixed temperature-sensing element shall be marked on the system inspection tag.

11.3.2.3 The tag shall be signed or initialed by the installer.

11.3.3 Fixed temperature-sensing elements other than the fusible metal alloy type shall be permitted to remain continuously in service, provided they are inspected and cleaned or replaced if necessary in accordance with the manufacturer's instructions every 12 months or more frequently to ensure proper operation of the system.

11.4 Recharging.

11.4.1 All extinguishing systems shall be recharged after use or as indicated by an inspection or a maintenance check.

11.4.2 Systems shall be recharged in accordance with the manufacturer's listed installation and maintenance manual.

11.5 Hydrostatic Testing. Hydrostatic testing shall be performed by persons trained in pressure-testing procedures and safeguards and having available suitable testing equipment, facilities, and an appropriate service manual(s).

11.5.1* The following parts of dry chemical extinguishing systems shall be subjected to a hydrostatic pressure test at intervals not exceeding 12 years:

- (1) Dry chemical containers
- (2) Auxiliary pressure containers
- (3) Hose assemblies

Exception No. 1: Dry chemical containers that are part of extinguishing systems having an agent capacity exceeding 150 lb (68 kg).

Exception No. 2: Auxiliary pressure containers not exceeding 2 in. (0.05 m) outside diameter and less than 2 ft (0.6 m) in length.

Exception No. 3: Auxiliary pressure containers bearing the DOT "3E" marking.

11.5.2 Dry chemical containers, auxiliary pressure containers, and hose assemblies shall be subjected to a hydrostatic test pressure equal to the marked factory test pressure or the test pressure specified in the manufacturer's listed installation and maintenance manual.

11.5.2.1 No leakage, rupture, or movement of hose couplings shall be permitted.

8.3.2 Smoking shall be strictly prohibited, except in designated smoking areas.

8.3.3* Welding, cutting, and similar spark-producing operations shall not be permitted in areas that contain aerosol products until a written permit authorizing the work has been issued.

8.3.3.1 The permit shall be issued by a person in authority following an inspection of the area to assure that proper precautions have been taken and will be followed until completion of the work.

8.4 Aisles. Storage in aisles shall be prohibited so as to permit access for fire fighting, salvage, and removal of stored commodities.

8.5 Waste Disposal.

8.5.1 Filled or partly filled aerosol containers shall be separated from all other rubbish and trash.

8.5.1.1 Filled or partly filled aerosol containers shall be placed in noncombustible waste containers.

8.5.2 Filled or partly filled aerosol containers shall not be disposed of in compactors, balers, or incinerators that crush the container or heat its contents.

8.5.2.1 Equipment and facilities that are specifically designed for the disposal of aerosol containers shall be permitted to dispose of filled or partly filled aerosol containers.

8.6 Inspection and Maintenance.

8.6.1 A written and documented preventive maintenance program shall be developed for equipment, machinery, and processes that are critical to fire-safe operation of the facility.

8.6.2 Critical detection systems and their components, emergency trips and interlocks, alarms, and safety shutdown systems shall be inspected on a regularly scheduled basis and any deficiencies shall be immediately corrected.

8.6.2.1 Items in this inspection schedule include, but are not limited to, the following:

- (1) Gas detection systems
- (2) Deflagration suppression systems
- (3) Deflagration vent systems
- (4) Ventilation and local exhaust systems
- (5) Propellant charging room door interlocks
- (6) Process safety devices
- (7) Fire alarm systems

8.7* Static Electricity. All process equipment and piping involved in the transfer of flammable liquids or gases shall be connected to a static-dissipating earth ground system to prevent accumulations of static charge.

Annex A Explanatory Material

Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

A.1.1.2 An example of an aerosol product that is not flammable and, therefore, not covered by this code is whipped cream: the base product is a water-based material and the propellant is nitrous oxide, which is nonflammable.

A.1.1.3 See NFPA 58, *Liquefied Petroleum Gas Code*.

A.1.2 This code provides minimum acceptable requirements for fire prevention and protection in facilities that manufacture and store aerosol products and in mercantile occupancies where aerosol products are displayed and sold. As explained in A.5.1 the hazards presented by each stage of the manufacturing process will vary, depending on the flammability of the base product and on the flammability of the propellant. Considerable judgment will be required of the designer and of the authority having jurisdiction to provide an adequate level of fire protection. (See also Annex B, *Mechanism of Fire Growth in Aerosol Containers*.)

A.1.4 This section should not be interpreted as discouraging the upgrading of existing aerosol manufacturing or storage facilities. Improvements to fire protection systems in existing facilities should be allowed without requiring retroactive compliance with all of the requirements of this code. It is the intent of this code, however, that major renovations to such a facility should meet, to the greatest extent practical, the requirements of this code.

A.3.2.1 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

A.3.2.2 Authority Having Jurisdiction (AHJ). The phrase "authority having jurisdiction," or its acronym AHJ, is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

A.3.2.3 Code. The decision to designate a standard as a "code" is based on such factors as the size and scope of the document, its intended use and form of adoption, and whether it contains substantial enforcement and administrative provisions.

A.3.3.1 Aerosol. The base product can be dispensed from the container in such form as a mist, spray, foam, gel, or aerated powder.

A.3.3.2 Aerosol Container. Maximum sizes, minimum strengths, and other critical limitations for aerosol containers are set by the U.S. Department of Transportation (49 CFR). These regulations assure that aerosol products can be safely

passage by vehicles. Signs shall be of an *approved* size, weather resistant and be maintained until replaced by permanent signs.

**SECTION 506
KEY BOXES / ELEVATOR KEYS**

SEE SFPc *

506.1 Where required. Where access to or within a structure or an area is restricted because of secured openings or where immediate access is necessary for life-saving or fire-fighting purposes, the *fire code official* is authorized to require a key box to be installed in an *approved* location. The key box shall be of an *approved* type and shall contain keys to gain necessary access as required by the *fire code official*.

506.1.1 Locks. An *approved* lock shall be installed on gates or similar barriers when required by the *fire code official*.

506.2 Key box maintenance. The operator of the building shall immediately notify the *fire code official* and provide the new key when a lock is changed or rekeyed. The key to such lock shall be secured in the key box.

⇒ 506.2 = SFPc = KEYS TO ELEVATORS

**SECTION 507
FIRE PROTECTION WATER SUPPLIES**

507.1 Required water supply. An *approved* water supply capable of supplying the required fire flow for fire protection shall be provided to premises upon which facilities, buildings or portions of buildings are hereafter constructed or moved into or within the jurisdiction.

507.2 Type of water supply. A water supply shall consist of reservoirs, pressure tanks, elevated tanks, water mains or other fixed systems capable of providing the required fire flow.

507.2.1 Private fire service mains. Private fire service mains and appurtenances shall be installed in accordance with NFPA 24.

507.2.2 Water tanks. Water tanks for private fire protection shall be installed in accordance with NFPA 22.

507.3 Fire flow. Fire flow requirements for buildings or portions of buildings and facilities shall be determined by an *approved* method.

SFPc SEE SFPc - SPRINKLER ALLOWANCES.

507.4 Water supply test. The *fire code official* shall be notified prior to the water supply test. Water supply tests shall be witnessed by the *fire code official* or *approved* documentation of the test shall be provided to the *fire code official* prior to final approval of the water supply system.

507.5 Fire hydrant systems. Fire hydrant systems shall comply with Sections 507.5.1 through 507.5.6.

SEE MOD II
— **507.5.1 Where required.** Where a portion of the facility or building hereafter constructed or moved into or within the jurisdiction is more than 400 feet (122 m) from a hydrant on a fire apparatus access road, as measured by an *approved* route around the exterior of the facility or building, on-site

fire hydrants and mains shall be provided where required by the *fire code official*.

Exceptions:

1. For Group R-3 and Group U occupancies, the distance requirement shall be 600 feet (183 m).
2. For buildings equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the distance requirement shall be 600 feet (183 m).

507.5.2 Inspection, testing and maintenance. Fire hydrant systems shall be subject to periodic tests as required by the *fire code official*. Fire hydrant systems shall be maintained in an operative condition at all times and shall be repaired where defective. Additions, repairs, *alterations* and servicing shall comply with *approved* standards.

507.5.3 Private fire service mains and water tanks. Private fire service mains and water tanks shall be periodically inspected, tested and maintained in accordance with NFPA 25 at the following intervals:

1. Private fire hydrants (all types): Inspection annually and after each operation; flow test and maintenance annually.
2. Fire service main piping: Inspection of exposed, annually; flow test every 5 years.
3. Fire service main piping strainers: Inspection and maintenance after each use.

507.5.4 Obstruction. Unobstructed access to fire hydrants shall be maintained at all times. The fire department shall not be deterred or hindered from gaining immediate access to fire protection equipment or fire hydrants.

507.5.5 Clear space around hydrants. A 3-foot (914 mm) clear space shall be maintained around the circumference of fire hydrants except as otherwise required or *approved*.

507.5.6 Physical protection. Where fire hydrants are subject to impact by a motor vehicle, guard posts or other *approved* means shall comply with Section 312.

**SECTION 508
FIRE COMMAND CENTER**

508.1 General. Where required by other sections of this code and in all buildings classified as high-rise buildings by the *International Building Code*, a *fire command center* for fire department operations shall be provided and shall comply with Sections 508.1.1 through 508.1.5.

508.1.1 Location and access. The location and accessibility of the *fire command center* shall be *approved* by the fire chief.

508.1.2 Separation. The *fire command center* shall be separated from the remainder of the building by not less than a 1-hour *fire barrier* constructed in accordance with Section 707 of the *International Building Code* or *horizontal assem-*

BUILDING SERVICES AND SYSTEMS

604.2.16 Group I-3 occupancies. Power-operated sliding doors or power-operated locks for swinging doors in Group I-3 occupancies shall be operable by a manual release mechanism at the door, and either emergency power or a remote mechanical operating release shall be provided.

Exception: Emergency power is not required in facilities where provisions for remote locking and unlocking of occupied rooms in Occupancy Condition 4 are not required as set forth in the *International Building Code*.

604.2.17 Airport traffic control towers. A standby power system shall be provided in airport traffic control towers more than 65 feet (19 812 mm) in height. Power shall be provided to the following equipment:

1. Pressurization equipment, mechanical equipment and lighting.
2. Elevator operating equipment.
3. Fire alarm and smoke detection systems.

604.2.18 Elevators. In buildings and structures where standby power is required or furnished to operate an elevator, the operation shall be in accordance with Sections 604.2.18.1 through 604.2.18.4.

604.2.18.1 Manual transfer. Standby power shall be manually transferable to all elevators in each bank.

604.2.18.2 One elevator. Where only one elevator is installed, the elevator shall automatically transfer to standby power within 60 seconds after failure of normal power.

604.2.18.3 Two or more elevators. Where two or more elevators are controlled by a common operating system, all elevators shall automatically transfer to standby power within 60 seconds after failure of normal power where the standby power source is of sufficient capacity to operate all elevators at the same time. Where the standby power source is not of sufficient capacity to operate all elevators at the same time, all elevators shall transfer to standby power in sequence, return to the designated landing and disconnect from the standby power source. After all elevators have been returned to the designated level, at least one elevator shall remain operable from the standby power source.

604.2.18.4 Venting. Where standby power is connected to elevators, the machine room ventilation or air conditioning shall be connected to the standby power source.

604.3 Maintenance. Emergency and standby power systems shall be maintained in accordance with NFPA 110 and NFPA 111 such that the system is capable of supplying service within the time specified for the type and duration required.

604.3.1 Schedule. Inspection, testing and maintenance of emergency and standby power systems shall be in accordance with an *approved* schedule established upon completion and approval of the system installation.

604.3.2 Written record. Written records of the inspection, testing and maintenance of emergency and standby power systems shall include the date of service, name of the servicing technician, a summary of conditions noted and a

detailed description of any conditions requiring correction and what corrective action was taken. Such records shall be kept on the premises served by the emergency or standby power system and be available for inspection by the *fire code official*.

604.3.3 Switch maintenance. Emergency and standby power system transfer switches shall be included in the inspection, testing and maintenance schedule required by Section 604.3.1. Transfer switches shall be maintained free from accumulated dust and dirt. Inspection shall include examination of the transfer switch contacts for evidence of deterioration. When evidence of contact deterioration is detected, the contacts shall be replaced in accordance with the transfer switch manufacturer's instructions.

604.4 Operational inspection and testing. Emergency power systems, including all appurtenant components shall be inspected and tested under load in accordance with NFPA 110 and NFPA 111.

Exception: Where the emergency power system is used for standby power or peak load shaving, such use shall be recorded and shall be allowed to be substituted for scheduled testing of the generator set, provided that appropriate records are maintained.

604.4.1 Transfer switch test. The test of the transfer switch shall consist of electrically operating the transfer switch from the normal position to the alternate position and then return to the normal position.

604.5 Supervision of maintenance and testing. Routine maintenance, inspection and operational testing shall be overseen by a properly instructed individual.

604.6 TESTING OF EM. LIGHTS

SECTION 605

ELECTRICAL EQUIPMENT, WIRING AND HAZARDS

605.1 Abatement of electrical hazards. Identified electrical hazards shall be abated. Identified hazardous electrical conditions in permanent wiring shall be brought to the attention of the responsible code official. Electrical wiring, devices, appliances and other equipment that is modified or damaged and constitutes an electrical shock or fire hazard shall not be used.

605.2 Illumination. Illumination shall be provided for service equipment areas, motor control centers and electrical panelboards.

605.3 Working space and clearance. A working space of not less than 30 inches (762 mm) in width, 36 inches (914 mm) in depth and 78 inches (1981 mm) in height shall be provided in front of electrical service equipment. Where the electrical service equipment is wider than 30 inches (762 mm), the working space shall not be less than the width of the equipment. No storage of any materials shall be located within the designated working space.

Exceptions:

1. Where other dimensions are required or allowed by NFPA 70.

608.6 Ventilation. Ventilation of stationary storage battery systems shall comply with Sections 608.6.1 and 608.6.2.

608.6.1 Room ventilation. Ventilation shall be provided in accordance with the *International Mechanical Code* and the following:

1. For flooded lead-acid, flooded Ni-Cad and VRLA batteries, the ventilation system shall be designed to limit the maximum concentration of hydrogen to 1.0 percent of the total volume of the room; or
2. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute per square foot (1 ft³/min/ft²) [0.0051 m³/s × m²] of floor area of the room.

Exception: Lithium-ion and lithium metal polymer batteries shall not require ventilation.

608.6.2 Cabinet ventilation. When VRLA batteries are installed inside a cabinet, the cabinet shall be *approved* for use in occupied spaces and shall be mechanically or naturally vented by one of the following methods:

1. The cabinet ventilation shall limit the maximum concentration of hydrogen to 1 percent of the total volume of the cabinet during the worst-case event of simultaneous "boost" charging of all the batteries in the cabinet; or
2. When calculations are not available to substantiate the ventilation rate, continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute per square foot [1 ft³/min/ft² or 0.0051 m³/(s × m²)] of floor area covered by the cabinet. The room in which the cabinet is installed shall also be ventilated as required in Section 608.6.1.

608.6.3 Supervision. Mechanical ventilation systems where required by Sections 608.6.1 and 608.6.2 shall be supervised by an *approved* central, proprietary or remote station service or shall initiate an audible and visual signal at a constantly attended on-site location.

608.7 Signage. Signs shall comply with Sections 608.7.1 and 608.7.2.

608.7.1 Equipment room and building signage. Doors into electrical equipment rooms or buildings containing stationary battery systems shall be provided with *approved* signs. The signs shall state that:

1. The room contains energized battery systems.
2. The room contains energized electrical circuits.
3. The battery electrolyte solutions, where present, are *corrosive* liquids.

608.7.2 Cabinet signage. Cabinets shall have exterior labels that identify the manufacturer and model number of the system and electrical rating (voltage and current) of the contained battery system. There shall be signs within the cabinet that indicate the relevant electrical, chemical and fire hazards.

608.8 Seismic protection. The battery systems shall be seismically braced in accordance with the *International Building Code*.

608.9 Smoke detection. An *approved* automatic smoke detection system shall be installed in accordance with Section 907.2 in rooms containing stationary battery systems.

SECTION 609 COMMERCIAL KITCHEN HOODS

[M] 609.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of the *International Mechanical Code*.

[M] 609.2 Where required. A Type I hood shall be installed at or above all commercial cooking appliances and domestic cooking appliances used for commercial purposes that produce grease vapors.

609.3 Operations and maintenance. Commercial cooking systems shall be operated and maintained in accordance with Sections 609.3.1 through 609.3.4.

609.3.1 Ventilation system. The ventilation system in connection with hoods shall be operated at the required rate of air movement, and classified grease filters shall be in place when equipment under a kitchen grease hood is used.

609.3.2 Grease extractors. Where grease extractors are installed, they shall be operated when the commercial-type cooking equipment is used.

609.3.3 Cleaning. Hoods, grease-removal devices, fans, ducts and other appurtenances shall be cleaned at intervals as required by Sections 609.3.3.1 through 609.3.3.3.

609.3.3.1 Inspection. Hoods, grease-removal devices, fans, ducts and other appurtenances shall be inspected at intervals specified in Table 609.3.3.1 or as *approved* by the *fire code official*. Inspections shall be completed by qualified individuals.

**TABLE 609.3.3.1
COMMERCIAL COOKING SYSTEM INSPECTION FREQUENCY**

TYPE OF COOKING OPERATIONS	FREQUENCY OF INSPECTION
High-volume cooking operations such as 24-hour cooking, charbroiling or wok cooking	3 months
Low-volume cooking operations such as places of religious worship, seasonal businesses and senior centers	12 months
Cooking operations utilizing solid-fuel burning cooking appliances	1 month
All other cooking operations	6 months

609.3.3.2 Grease accumulation. If during the inspection it is found that hoods, grease-removal devices, fans, ducts or other appurtenances have an accumulation of grease, such components shall be cleaned.

609.3.3.3 Records. Records for inspections shall state the individual and company performing the inspection, a description of the inspection and when the inspection took place. Records for cleanings shall state the individual and company performing the cleaning and when the cleaning took place. Such records shall be completed

TABLE 906.1—continued
ADDITIONAL REQUIRED PORTABLE FIRE EXTINGUISHERS

SECTION	SUBJECT
2003.5	Organic-coating areas
2106.3	Industrial ovens
2205.5	Motor fuel-dispensing facilities
2210.6.4	Marine motor fuel-dispensing facilities
2211.6	Repair garages
2306.10	Rack storage
2404.12	Tents and membrane structures
2508.2	Tire rebuilding/storage
2604.2.6	Welding and other hot work
2903.6	Combustible fibers
3403.2.1	Flammable and combustible liquids, general
3404.3.3.1	Indoor storage of flammable and combustible liquids
3404.3.7.5.2	Liquid storage rooms for flammable and combustible liquids
3405.4.9	Solvent distillation units
3406.2.7	Farms and construction sites—flammable and combustible liquids storage
3406.4.10.1	Bulk plants and terminals for flammable and combustible liquids
3406.5.4.5	Commercial, industrial, governmental or manufacturing establishments—fuel dispensing
3406.6.4	Tank vehicles for flammable and combustible liquids
3606.5.7	Flammable solids
3808.2	LP-gas
4504.4	Marinas

906.2 General requirements. Portable fire extinguishers shall be selected, installed and maintained in accordance with this section and NFPA 10.

Exceptions:

1. The travel distance to reach an extinguisher shall not apply to the spectator seating portions of Group A-5 occupancies.
2. Thirty-day inspections shall not be required and maintenance shall be allowed to be once every three years for dry-chemical or halogenated agent portable fire extinguishers that are supervised by a *listed* and *approved* electronic monitoring device, provided that all of the following conditions are met:
 - 2.1. Electronic monitoring shall confirm that extinguishers are properly positioned, properly charged and unobstructed.

- 2.2. Loss of power or circuit continuity to the electronic monitoring device shall initiate a trouble signal.
- 2.3. The extinguishers shall be installed inside of a building or cabinet in a noncorrosive environment.
- 2.4. Electronic monitoring devices and supervisory circuits shall be tested every three years when extinguisher maintenance is performed.
- 2.5. A written log of required hydrostatic test dates for extinguishers shall be maintained by the *owner* to verify that hydrostatic tests are conducted at the frequency required by NFPA 10.

3. In Group I-3, portable fire extinguishers shall be permitted to be located at staff locations.

906.3 Size and distribution. The size and distribution of portable fire extinguishers shall be in accordance with Sections 906.3.1 through 906.3.4.

906.3.1 Class A fire hazards. Portable fire extinguishers for occupancies that involve primarily Class A fire hazards, the minimum sizes and distribution shall comply with Table 906.3(1).

TABLE 906.3(1)
FIRE EXTINGUISHERS FOR CLASS A FIRE HAZARDS

	LIGHT (Low) HAZARD OCCUPANCY	ORDINARY (Moderate) HAZARD OCCUPANCY	EXTRA (High) HAZARD OCCUPANCY
Minimum Rated Single Extinguisher	2-A ^c	2-A	4-A ^a
Maximum Floor Area Per Unit of A	3,000 square feet	1,500 square feet	1,000 square feet
Maximum Floor Area For Extinguisher ^b	11,250 square feet	11,250 square feet	11,250 square feet
Maximum Travel Distance to Extinguisher	75 feet	75 feet	75 feet

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m², 1 gallon = 3.785 L.

- a. Two 2½-gallon water-type extinguishers shall be deemed the equivalent of one 4-A rated extinguisher.
- b. Annex E.3.3 of NFPA 10 provides more details concerning application of the maximum floor area criteria.
- c. Two water-type extinguishers each with a 1-A rating shall be deemed the equivalent of one 2-A rated extinguisher for Light (Low) Hazard Occupancies.

906.3.2 Class B fire hazards. Portable fire extinguishers for occupancies involving flammable or *combustible liquids* with depths of less than or equal to 0.25-inch (6.35 mm) shall be selected and placed in accordance with Table 906.3(2).

Portable fire extinguishers for occupancies involving flammable or *combustible liquids* with a depth of greater than 0.25-inch (6.35 mm) shall be selected and placed in accordance with NFPA 10.

CHAPTER 9

FIRE PROTECTION SYSTEMS

SECTION 901 GENERAL

901.1 Scope. The provisions of this chapter shall specify where *fire protection systems* are required and shall apply to the design, installation, inspection, operation, testing and maintenance of all *fire protection systems*.

901.2 Construction documents. The *fire code official* shall have the authority to require *construction documents* and calculations for all *fire protection systems* and to require permits be issued for the installation, rehabilitation or modification of any *fire protection system*. *Construction documents* for *fire protection systems* shall be submitted for review and approval prior to system installation.

901.2.1 Statement of compliance. Before requesting final approval of the installation, where required by the *fire code official*, the installing contractor shall furnish a written statement to the *fire code official* that the subject *fire protection system* has been installed in accordance with *approved plans* and has been tested in accordance with the manufacturer's specifications and the appropriate installation standard. Any deviations from the design standards shall be noted and copies of the approvals for such deviations shall be attached to the written statement.

901.3 Permits. Permits shall be required as set forth in Section 105.6 and 105.7.

901.4 Installation. *Fire protection systems* shall be maintained in accordance with the original installation standards for that system. Required systems shall be extended, altered or augmented as necessary to maintain and continue protection whenever the building is altered, remodeled or added to. *Alterations to fire protection systems* shall be done in accordance with applicable standards.

901.4.1 Required fire protection systems. *Fire protection systems* required by this code or the *International Building Code* shall be installed, repaired, operated, tested and maintained in accordance with this code.

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- **901.4.2 Nonrequired fire protection systems.** Any *fire protection system* or portion thereof not required by this code or the *International Building Code* shall be allowed to be furnished for partial or complete protection provided such installed system meets the requirements of this code and the *International Building Code*.

901.4.3 Additional fire protection systems. In occupancies of a hazardous nature, where special hazards exist in addition to the normal hazards of the occupancy, or where the *fire code official* determines that access for fire apparatus is unduly difficult, the *fire code official* shall have the authority to require additional safeguards. Such safeguards include, but shall not be limited to, the following: automatic fire detection systems, fire alarm systems, automatic fire-extinguishing systems, standpipe systems, or portable or fixed extinguishers. Fire protection equipment required

under this section shall be installed in accordance with this code and the applicable referenced standards.

901.4.4 Appearance of equipment. Any device that has the physical appearance of life safety or fire protection equipment but that does not perform that life safety or fire protection function shall be prohibited.

901.5 Installation acceptance testing. Fire detection and alarm systems, fire-extinguishing systems, fire hydrant systems, fire standpipe systems, fire pump systems, private fire service mains and all other *fire protection systems* and appurtenances thereto shall be subject to acceptance tests as contained in the installation standards and as *approved* by the *fire code official*. The *fire code official* shall be notified before any required acceptance testing.

901.5.1 Occupancy. It shall be unlawful to occupy any portion of a building or structure until the required fire detection, alarm and suppression systems have been tested and *approved*.

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- **901.6 Inspection, testing and maintenance.** Fire detection, alarm and extinguishing systems shall be maintained in an operative condition at all times, and shall be replaced or repaired where defective. Nonrequired *fire protection systems* and equipment shall be inspected, tested and maintained or removed.

901.6.1 Standards. *Fire protection systems* shall be inspected, tested and maintained in accordance with the referenced standards listed in Table 901.6.1.

TABLE 901.6.1
FIRE PROTECTION SYSTEM MAINTENANCE STANDARDS

SYSTEM	STANDARD
Portable fire extinguishers	NFPA 10
Carbon dioxide fire-extinguishing system	NFPA 12
Halon 1301 fire-extinguishing systems	NFPA 12A
Dry-chemical extinguishing systems	NFPA 17
Wet-chemical extinguishing systems	NFPA 17A
Water-based fire protection systems	NFPA 25
Fire alarm systems	NFPA 72
Water-mist systems	NFPA 750
Clean-agent extinguishing systems	NFPA 2001

901.6.2 Records. Records of all system inspections, tests and maintenance required by the referenced standards shall be maintained on the premises for a minimum of three years and shall be copied to the *fire code official* upon request.

901.6.2.1 Records information. Initial records shall include the name of the installation contractor, type of components installed, manufacturer of the components,

CHAPTER 7

FIRE-RESISTANCE-RATED CONSTRUCTION

SECTION 701 GENERAL

701.1 Scope. The provisions of this chapter shall specify the requirements for and the maintenance of fire-resistance-rated construction. New buildings shall comply with the *International Building Code*.

701.2 Unsafe conditions. Where any components in this chapter are not maintained and do not function as intended or do not have the *fire resistance* required by the code under which the building was constructed, remodeled or altered, such component(s) or portion thereof shall be deemed an unsafe condition, in accordance with Section 110.1.1. Components or portions thereof determined to be unsafe shall be repaired or replaced to conform to that code under which the building was constructed, remodeled, altered or this chapter, as deemed appropriate by the *fire code official*.

Where the extent of the conditions of components is such that any building, structure or portion thereof presents an imminent danger to the occupants of the building, structure or portion thereof, the *fire code official* shall act in accordance with Section 110.2.

SECTION 702 DEFINITIONS

702.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

[B] **DRAFTSTOP.** A material, device or construction installed to restrict the movement of air within open spaces of concealed areas of building components such as crawl spaces, floor/ceiling assemblies, roof/ceiling assemblies and attics.

[B] **FIRE-RESISTANT JOINT SYSTEM.** An assemblage of specific materials or products that are designed, tested and fire-resistance rated in accordance with either ASTM E 1966 or UL 2079 to resist for a prescribed period of time the passage of fire through joints made in or between fire-resistance-rated assemblies.

[B] **FIREBLOCKING.** Building materials, or materials *approved* for use as fireblocking, installed to resist the free passage of flame to other areas of the building through concealed spaces.

SECTION 703 FIRE-RESISTANCE-RATED CONSTRUCTION

703.1 Maintenance. The required *fire-resistance rating* of fire-resistance-rated construction (including walls, firestops, shaft enclosures, partitions, *smoke barriers*, floors, fire-resistive coatings and sprayed fire-resistant materials applied to structural members and fire-resistant joint systems) shall be maintained. Such elements shall be visually inspected by the

owner annually and properly repaired, restored or replaced when damaged, altered, breached or penetrated. Where concealed, such elements shall not be required to be visually inspected by the *owner* unless the concealed space is accessible by the removal or movement of a panel, access door, ceiling tile or similar movable entry to the space. Openings made therein for the passage of pipes, electrical conduit, wires, ducts, air transfer openings and holes made for any reason shall be protected with *approved* methods capable of resisting the passage of smoke and fire. Openings through fire-resistance-rated assemblies shall be protected by self- or automatic-closing doors of *approved* construction meeting the fire protection requirements for the assembly.

703.1.1 Fireblocking and draftstopping. Required *fire-blocking* and draftstopping in combustible concealed spaces shall be maintained to provide continuity and integrity of the construction.

703.1.2 Smoke barriers and smoke partitions. Required *smoke barriers* and smoke partitions shall be maintained to prevent the passage of smoke. All openings protected with *approved* smoke barrier doors or smoke dampers shall be maintained in accordance with NFPA 105.

703.1.3 Fire walls, fire barriers and fire partitions. Required *fire walls*, *fire barriers* and *fire partitions* shall be maintained to prevent the passage of fire. All openings protected with *approved* doors or fire dampers shall be maintained in accordance with NFPA 80.

703.2 Opening protectives. Opening protectives shall be maintained in an operative condition in accordance with NFPA 80. Fire doors and *smoke barrier* doors shall not be blocked or obstructed or otherwise made inoperable. Fusible links shall be replaced promptly whenever fused or damaged. Fire door assemblies shall not be modified.

703.2.1 Signs. Where required by the *fire code official*, a sign shall be permanently displayed on or near each fire door in letters not less than 1 inch (25 mm) high to read as follows:

1. For doors designed to be kept normally open: FIRE DOOR—DO NOT BLOCK.
2. For doors designed to be kept normally closed: FIRE DOOR—KEEP CLOSED.

703.2.2 Hold-open devices and closers. Hold-open devices and automatic door closers, where provided, shall be maintained. During the period that such device is out of service for repairs, the door it operates shall remain in the closed position.

703.2.3 Door operation. Swinging fire doors shall close from the full-open position and latch automatically. The door closer shall exert enough force to close and latch the door from any partially open position.

907.9 Inspection, testing and maintenance. The maintenance and testing schedules and procedures for fire alarm and fire detection systems shall be in accordance with Sections 907.9.1 through 907.9.5 and NFPA 72.

907.9.1 Maintenance required. Whenever required for compliance with the provisions of this code, devices, equipment, systems, conditions, arrangements, levels of protection or other features shall thereafter be continuously maintained in accordance with applicable NFPA requirements or as directed by the *fire code official*.

907.9.2 Testing. Testing shall be performed in accordance with the schedules in NFPA 72 or more frequently where required by the *fire code official*.

Exception: Devices or equipment that are inaccessible for safety considerations shall be tested during scheduled shutdowns where *approved* by the *fire code official*, but not less than every 18 months.

907.9.3 Smoke detector sensitivity. Smoke detector sensitivity shall be checked within one year after installation and every alternate year thereafter. After the second calibration test, where sensitivity tests indicate that the detector has remained within its *listed* and marked sensitivity range (or 4-percent obscuration light grey smoke, if not marked), the length of time between calibration tests shall be permitted to be extended to a maximum of five years. Where the frequency is extended, records of detector-caused nuisance alarms and subsequent trends of these alarms shall be maintained. In zones or areas where nuisance alarms show any increase over the previous year, calibration tests shall be performed.

907.9.4 Method. To verify that each smoke detector is within its *listed* and marked sensitivity range, it shall be tested using one of the following methods:

1. A calibrated test method;
2. The manufacturer's calibrated sensitivity test instrument;
3. *Listed* control equipment arranged for the purpose;
4. A smoke detector/control unit arrangement whereby the detector causes a signal at the control unit where the detector's sensitivity is outside its acceptable sensitivity range; or
5. Another calibrated sensitivity test method acceptable to the *fire code official*.

Detectors found to have a sensitivity outside the *listed* and marked sensitivity range shall be cleaned and recalibrated or replaced.

Exceptions:

1. Detectors *listed* as field adjustable shall be permitted to be either adjusted within the *listed* and marked sensitivity range and cleaned and recalibrated or they shall be replaced.
2. This requirement shall not apply to single-station smoke alarms.

907.9.4.1 Testing device. Smoke detector sensitivity shall not be tested or measured using a device that administers an unmeasured concentration of smoke or other aerosol into the detector.

907.9.5 Maintenance, inspection and testing. The building owner shall be responsible to maintain the fire and life safety systems in an operable condition at all times. Service personnel shall meet the qualification requirements of NFPA 72 for maintaining, inspecting and testing such systems. A written record shall be maintained and shall be made available to the *fire code official*.

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**SECTION 908
EMERGENCY ALARM SYSTEMS**

908.1 Group H occupancies. Emergency alarms for the detection and notification of an emergency condition in Group H occupancies shall be provided as required in Chapter 27.

908.2 Group H-5 occupancy. Emergency alarms for notification of an emergency condition in an HPM facility shall be provided as required in Section 1803.12. A continuous gas detection system shall be provided for HPM gases in accordance with Section 1803.13.

908.3 Highly toxic and toxic materials. Where required by Section 3704.2.2.10, a gas detection system shall be provided for indoor storage and use of highly toxic and toxic *compressed gases*.

908.4 Ozone gas-generator rooms. A gas detection system shall be provided in ozone gas-generator rooms in accordance with Section 3705.3.2.

908.5 Repair garages. A flammable-gas detection system shall be provided in repair garages for vehicles fueled by nonodorized gases in accordance with Section 2211.7.2.

908.6 Refrigeration systems. Refrigeration system machinery rooms shall be provided with a refrigerant detector in accordance with Section 606.8.

**SECTION 909
SMOKE CONTROL SYSTEMS**

909.1 Scope and purpose. This section applies to mechanical or passive smoke control systems when they are required for new buildings or portions thereof by provisions of the *International Building Code* or this code. The purpose of this section is to establish minimum requirements for the design, installation and acceptance testing of smoke control systems that are intended to provide a tenable environment for the evacuation or relocation of occupants. These provisions are not intended for the preservation of contents, the timely restoration of operations, or for assistance in fire suppression or overhaul activities. Smoke control systems regulated by this section serve a different purpose than the smoke- and heat-venting provisions found in Section 910. Mechanical smoke control systems shall not be considered exhaust systems under Chapter 5 of the *International Mechanical Code*.

909.2 General design requirements. Buildings, structures, or parts thereof required by the *International Building Code* or

1908.6 Static pile protection. Static piles shall be monitored by an *approved* means to measure temperatures within the static piles. Internal pile temperatures shall be monitored and recorded weekly. Records shall be kept on file at the facility and made available for inspection. An operational plan indicating procedures and schedules for the inspection, monitoring and restricting of excessive internal temperatures in static piles shall be submitted to the *fire code official* for review and approval.

1908.7 Pile fire protection. Automatic sprinkler protection shall be provided in conveyor tunnels and combustible enclosures that pass under a pile. Combustible conveyor systems and enclosed conveyor systems shall be equipped with an *approved automatic sprinkler system*.

1908.8 Fire extinguishers. Portable fire extinguishers complying with Section 906 and with a minimum rating of 4-A:60-B:C shall be provided on all vehicles and equipment operating on piles and at all processing equipment.

1908.9 Material-handling equipment. *Approved* material-handling equipment shall be available for moving wood chips, hogged material, wood fines and raw product during fire-fighting operations.

1908.10 Emergency plan. The *owner* or operator shall develop a plan for monitoring, controlling and extinguishing spot fires and submit the plan to the *fire code official* for review and approval.

SECTION 1909 EXTERIOR STORAGE OF FINISHED LUMBER PRODUCTS

1909.1 General. Exterior storage of finished lumber products shall comply with Sections 1909.1 through 1909.5.

1909.2 Size of piles. Exterior lumber storage shall be arranged to form stable piles with a maximum height of 20 feet (6096 mm). Piles shall not exceed 150,000 cubic feet (4248 m³) in volume.

1909.3 Fire apparatus access roads. Fire apparatus access roads in accordance with Section 503 shall be located so that a maximum grid system unit of 50 feet by 150 feet (15 240 mm by 45 720 mm) is established.

1909.4 Security. Permanent lumber storage areas shall be surrounded with an *approved* fence. Fences shall be a minimum of 6 feet (1829 mm) in height.

Exception: Lumber piles inside of buildings and production mills for lumber, plywood and veneer.

1909.5 Fire protection. An *approved* hydrant and hose system or portable fire-extinguishing equipment suitable for the fire hazard involved shall be provided for open storage yards. Hydrant and hose systems shall be installed in accordance with NFPA 24. Portable fire extinguishers complying with Section 906 shall be located so that the travel distance to the nearest unit does not exceed 75 feet (22 860 mm).

2. The blaster shall allow sufficient time for smoke and fumes to dissipate and for dust to settle before returning to or approaching the blast area.
3. The blaster shall inspect the entire blast site for misfires before allowing other personnel to return to the blast area.

3307.15 Misfires. Where a misfire is suspected, all initiating circuits shall be traced and a search made for unexploded charges. Where a misfire is found, the blaster shall provide proper safeguards for excluding all personnel from the blast area. Misfires shall be reported to the blasting supervisor immediately. Misfires shall be handled under the direction of the person in charge of the blasting operation in accordance with NFPA 495.

ADD 3307.16

SECTION 3308 FIREWORKS DISPLAY

3308.1 General. Outdoor fireworks displays, use of pyrotechnics before a *proximate audience* and pyrotechnic special effects in motion picture, television, theatrical and group entertainment productions shall comply with Sections 3308.2 through 3308.10 and NFPA 1123 or NFPA 1126.

3308.2 Permit application. Prior to issuing permits for a fireworks display, plans for the fireworks display, inspections of the display site and demonstrations of the display operations shall be *approved*. A plan establishing procedures to follow and actions to be taken in the event that a shell fails to ignite in, or discharge from, a mortar or fails to function over the fallout area or other malfunctions shall be provided to the *fire code official*.

3308.2.1 Outdoor fireworks displays. In addition to the requirements of Section 403, permit applications for outdoor fireworks displays using Division 1.3G fireworks shall include a diagram of the location at which the fireworks display will be conducted, including the site from which fireworks will be discharged; the location of buildings, highways, overhead obstructions and utilities; and the lines behind which the audience will be restrained.

3308.2.2 Use of pyrotechnics before a proximate audience. Where the separation distances required in Section 3308.4 and NFPA 1123 are unavailable or cannot be secured, fireworks displays shall be conducted in accordance with NFPA 1126 for *proximate audiences*. Applications for use of pyrotechnics before a *proximate audience* shall include plans indicating the required clearances for spectators and combustibles, crowd control measures, smoke control measures and requirements for standby personnel and equipment when provision of such personnel or equipment is required by the *fire code official*.

3308.3 Approved fireworks displays. *Approved* fireworks displays shall include only the *approved* fireworks 1.3G, fireworks 1.4G, fireworks 1.4S and pyrotechnic articles, 1.4G, which shall be handled by an *approved*, competent operator. The *approved* fireworks shall be arranged, located, discharged and fired in a manner that will not pose a hazard to property or endanger any person.

3308.4 Clearance. Spectators, spectator parking areas, and *dwellings*, buildings or structures shall not be located within the display site.

Exceptions:

1. This provision shall not apply to pyrotechnic special effects and fireworks displays using Division 1.4G materials before a *proximate audience* in accordance with NFPA 1126.
2. This provision shall not apply to unoccupied *dwellings*, buildings and structures with the approval of the building owner and the *fire code official*.

3308.5 Storage of fireworks at display site. The storage of fireworks at the display site shall comply with the requirements of this section and NFPA 1123 or NFPA 1126.

3308.5.1 Supervision and weather protection. Beginning as soon as fireworks have been delivered to the display site, they shall not be left unattended.

3308.5.2 Weather protection. Fireworks shall be kept dry after delivery to the display site.

3308.5.3 Inspection. Shells shall be inspected by the operator or assistants after delivery to the display site. Shells having tears, leaks, broken fuses or signs of having been wet shall be set aside and shall not be fired. Aerial shells shall be checked for proper fit in mortars prior to discharge. Aerial shells that do not fit properly shall not be fired. After the fireworks display, damaged, deteriorated or dud shells shall either be returned to the supplier or destroyed in accordance with the supplier's instructions and Section 3304.10.

Exception: Minor repairs to fuses shall be allowed. For electrically ignited displays, attachment of electric matches and similar tasks shall be allowed.

3308.5.4 Sorting and separation. After delivery to the display site and prior to the fireworks display, all shells shall be separated according to size and their designation as salutes.

Exception: For electrically fired displays, or displays where all shells are loaded into mortars prior to the show, there is no requirement for separation of shells according to size or their designation as salutes.

3308.5.5 Ready boxes. Display fireworks, 1.3G, that will be temporarily stored at the site during the fireworks display shall be stored in ready boxes located upwind and at least 25 feet (7620 mm) from the mortar placement and separated according to size and their designation as salutes.

Exception: For electrically fired fireworks displays, or fireworks displays where all shells are loaded into mortars prior to the show, there is no requirement for separation of shells according to size, their designation as salutes or for the use of ready boxes.

3308.6 Installation of mortars. Mortars for firing fireworks shells shall be installed in accordance with NFPA 1123 and shall be positioned so that shells are propelled away from spectators and over the fallout area. Under no circumstances shall mortars be angled toward the spectator viewing area. Prior to placement, mortars shall be inspected for defects, such as

3304.7.1 Security. Magazines shall be kept locked in the manner prescribed in NFPA 495 at all times except during placement or removal of *explosives* or inspection.

3304.7.2 Open flames and lights. Smoking, matches, flame-producing devices, open flames, firearms and firearms cartridges shall not be allowed inside of or within 50 feet (15 240 mm) of magazines.

3304.7.3 Brush. The area located around a magazine shall be kept clear of brush, dried grass, leaves, trash, debris and similar combustible materials for a distance of 25 feet (7620 mm).

3304.7.4 Combustible storage. Combustible materials shall not be stored within 50 feet (15 240 mm) of magazines.

3304.7.5 Unpacking and repacking explosive materials. Containers of *explosive materials*, except fiberboard containers, and packages of damaged or deteriorated *explosive materials* or fireworks shall not be unpacked or repacked inside or within 50 feet (15 240 mm) of a magazine or in close proximity to other *explosive materials*.

3304.7.5.1 Storage of opened packages. Packages of *explosive materials* that have been opened shall be closed before being placed in a magazine.

3304.7.5.2 Nonsparking tools. Tools used for the opening and closing of packages of *explosive materials*, other than metal slitters for opening paper, plastic or fiberboard containers, shall be made of nonsparking materials.

3304.7.5.3 Disposal of packaging. Empty containers and paper and fiber packaging materials that previously contained *explosive materials* shall be disposed of or reused in a *approved* manner.

3304.7.6 Tools and equipment. Metal tools, other than nonferrous transfer conveyors and ferrous metal conveyor stands protected by a coat of paint, shall not be stored in a magazine containing *explosive materials* or detonators.

3304.7.7 Contents. Magazines shall be used exclusively for the storage of *explosive materials*, blasting materials and blasting accessories.

3304.7.8 Compatibility. Corresponding grades and brands of *explosive materials* shall be stored together and in such a manner that the grade and brand marks are visible. Stocks shall be stored so as to be easily counted and checked. Packages of *explosive materials* shall be stacked in a stable manner not exceeding 8 feet (2438 mm) in height.

3304.7.9 Stock rotation. When *explosive material* is removed from a magazine for use, the oldest usable stocks shall be removed first.

3304.8 Maintenance. Maintenance of magazines shall comply with Sections 3304.8.1 through 3304.8.3.

3304.8.1 Housekeeping. Magazine floors shall be regularly swept and be kept clean, dry and free of grit, paper, empty packages and rubbish. Brooms and other cleaning utensils shall not have any spark-producing metal parts. Sweepings from magazine floors shall be disposed of in accordance with the manufacturers' *approved* instructions.

3304.8.2 Repairs. *Explosive materials* shall be removed from the magazine before making repairs to the interior of a magazine. *Explosive materials* shall be removed from the magazine before making repairs to the exterior of the magazine where there is a possibility of causing a fire. *Explosive materials* removed from a magazine under repair shall either be placed in another magazine or placed a safe distance from the magazine, where they shall be properly guarded and protected until repairs have been completed. Upon completion of repairs, the *explosive materials* shall be promptly returned to the magazine. Floors shall be cleaned before and after repairs.

3304.8.3 Floors. Magazine floors stained with liquid shall be dealt with according to instructions obtained from the manufacturer of the *explosive material* stored in the magazine.

3304.9 Inspection. Magazines containing *explosive materials* shall be opened and inspected at maximum seven-day intervals. The inspection shall determine whether there has been an unauthorized or attempted entry into a magazine or an unauthorized removal of a magazine or its contents.

3304.10 Disposal of explosive materials. *Explosive materials* shall be disposed of in accordance with Sections 3304.10.1 through 3304.10.7.

3304.10.1 Notification. The *fire code official* shall be notified immediately when deteriorated or leaking *explosive materials* are determined to be dangerous or unstable and in need of disposal.

3304.10.2 Deteriorated materials. When an *explosive material* has deteriorated to an extent that it is in an unstable or dangerous condition, or when a liquid has leaked from an *explosive material*, the *person* in possession of such material shall immediately contact the material's manufacturer to obtain disposal and handling instructions.

3304.10.3 Qualified person. The work of destroying *explosive materials* shall be directed by *persons* experienced in the destruction of *explosive materials*.

3304.10.4 Storage of misfires. *Explosive materials* and fireworks recovered from blasting or display misfires shall be placed in a magazine until an experienced *person* has determined the proper method for disposal.

3304.10.5 Disposal sites. Sites for the destruction of *explosive materials* and fireworks shall be *approved* and located at the maximum practicable safe distance from inhabited buildings, public highways, operating buildings and all other exposures to ensure keeping air blast and ground vibration to a minimum. The location of disposal sites shall be no closer to magazines, inhabited buildings, railways, highways and other rights-of-way than is allowed by Tables 3304.5.2(1), 3304.5.2(2) and 3304.5.2(3). When possible, *barricades* shall be utilized between the destruction site and inhabited buildings. Areas where *explosives* are detonated or burned shall be posted with adequate warning signs.

3304.10.6 Reuse of site. Unless an *approved* burning site has been thoroughly saturated with water and has passed a safety inspection, 48 hours shall elapse between the com-

one contains or is designed to contain *explosives*, or the distance between a magazine and an operating building.

Minimum separation distance (D_o). The minimum separation distance between adjacent buildings occupied in conjunction with the manufacture, transportation, storage or use of *explosive materials* where one of the buildings contains *explosive materials* and the other building does not.

RAILWAY. A steam, electric or other railroad or railway that carries passengers for hire.

READY BOX. A weather-resistant container with a self-closing or automatic-closing cover that protects fireworks shells from burning debris. Tarpaulins shall not be considered as ready boxes.

SMALL ARMS AMMUNITION. A shotgun, rifle or pistol cartridge and any cartridge for propellant-actuated devices. This definition does not include military ammunition containing bursting charges or incendiary, trace, spotting or pyrotechnic projectiles.

SMALL ARMS PRIMERS. Small percussion-sensitive *explosive* charges, encased in a cap, used to ignite propellant powder.

SMOKELESS PROPELLANTS. Solid propellants, commonly referred to as smokeless powders, used in small arms ammunition, cannons, rockets, propellant-actuated devices and similar articles.

SPECIAL INDUSTRIAL EXPLOSIVE DEVICE. An explosive power pack containing an *explosive* charge in the form of a cartridge or construction device. The term includes but is not limited to explosive rivets, explosive bolts, *explosive* charges for driving pins or studs, cartridges for *explosive*-actuated power tools and charges of *explosives* used in automotive air bag inflators, jet tapping of open hearth furnaces and jet perforation of oil well casings.

THEFT RESISTANT. Construction designed to deter illegal entry into facilities for the storage of *explosive materials*.

SECTION 3303 RECORD KEEPING AND REPORTING

3303.1 General. Records of the receipt, handling, use or disposal of *explosive materials*, and reports of any accidents, thefts or unauthorized activities involving *explosive materials* shall conform to the requirements of this section.

3303.2 Transaction record. The permittee shall maintain a record of all transactions involving receipt, removal, use or disposal of *explosive materials*. Such a record shall be maintained for a period of five years, and shall be furnished to the *fire code official* for inspection upon request.

Exception: Where only Division 1.4G (consumer fireworks) are handled, records need only be maintained for a period of three years.

3303.3 Loss, theft or unauthorized removal. The loss, theft or unauthorized removal of *explosive materials* from a magazine or permitted facility shall be reported to the *fire code official*, local law enforcement authorities and the U.S.

Department of Treasury, Bureau of Alcohol, Tobacco and Firearms within 24 hours.

Exception: Loss of Division 1.4G (consumer fireworks) need not be reported to the Bureau of Alcohol, Tobacco and Firearms.

3303.4 Accidents. Accidents involving the use of *explosives*, *explosive materials* and fireworks, which result in injuries or property damage, shall be reported to the *fire code official* immediately.

3303.5 Misfires. The pyrotechnic display operator or blaster in charge shall keep a record of all aerial shells that fail to fire or charges that fail to detonate.

3303.6 Hazard communication. Manufacturers of *explosive materials* and fireworks shall maintain records of chemicals, chemical compounds and mixtures required by DOL 29 CFR, Part 1910.1200, and Section 407.

3303.7 Safety rules. Current safety rules covering the operation of magazines, as described in Section 3304.7, shall be posted on the interior of the magazine in a visible location.

SECTION 3304 EXPLOSIVE MATERIALS STORAGE AND HANDLING

3304.1 General. Storage of *explosives* and *explosive materials*, small arms ammunition, small arms primers, propellant-actuated cartridges and smokeless propellants in magazines shall comply with the provisions of this section.

3304.2 Magazine required. *Explosives* and *explosive materials*, and Division 1.3G fireworks shall be stored in magazines constructed, located, operated and maintained in accordance with the provisions of Section 3304 and NFPA 495 or NFPA 1124.

Exceptions:

1. Storage of fireworks at display sites in accordance with Section 3308.5 and NFPA 1123 or NFPA 1126.
2. Portable or mobile magazines not exceeding 120 square feet (11 m²) in area shall not be required to comply with the requirements of the *International Building Code*.

3304.3 Magazines. The storage of *explosives* and *explosive materials* in magazines shall comply with Table 3304.3.

3304.3.1 High explosives. *Explosive materials* classified as Division 1.1 or 1.2 or formerly classified as Class A by the U.S. Department of Transportation shall be stored in Type 1, 2 or 3 magazines.

Exceptions:

1. Black powder shall be stored in a Type 1, 2, 3 or 4 magazine.
2. Cap-sensitive *explosive material* that is demonstrated not to be bullet sensitive shall be stored in a Type 1, 2, 3, 4 or 5 magazine.

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dents, bent ends, damaged interiors and damaged plugs. Defective mortars shall not be used.

3308.7 Handling. Aerial shells shall be carried to mortars by the shell body. For the purpose of loading mortars, aerial shells shall be held by the thick portion of the fuse and carefully loaded into mortars.

3308.8 Fireworks display supervision. Whenever in the opinion of the *fire code official* or the operator a hazardous condition exists, the fireworks display shall be discontinued immediately until such time as the dangerous situation is corrected.

3308.9 Post-fireworks display inspection. After the fireworks display, the firing crew shall conduct an inspection of the fallout area for the purpose of locating unexploded aerial shells or live components. This inspection shall be conducted before public access to the site shall be allowed. Where fireworks are displayed at night and it is not possible to inspect the site thoroughly, the operator or designated assistant shall inspect the entire site at first light.

A report identifying any shells that fail to ignite in, or discharge from, a mortar or fail to function over the fallout area or otherwise malfunction, shall be filed with the *fire code official*.

3308.10 Disposal. Any shells found during the inspection required in Section 3308.9 shall not be handled until at least 15 minutes have elapsed from the time the shells were fired. The fireworks shall then be doused with water and allowed to remain for at least 5 additional minutes before being placed in a plastic bucket or fiberboard box. The disposal instructions of the manufacturer as provided by the fireworks supplier shall then be followed in disposing of the fireworks in accordance with Section 3304.10.

SECTION 3309 TEMPORARY STORAGE OF CONSUMER FIREWORKS

3309.1 General. Where the temporary storage of consumer fireworks, 1.4G is allowed by Section 3301.1.3, Exception 4, such storage shall comply with the applicable requirements of NFPA 1124.

NFPA 10
Standard for
Portable Fire Extinguishers
2010 Edition

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Information on referenced publications can be found in Chapter 2 and Annex K.

Chapter 1 Administration

1.1* Scope. The provisions of this standard apply to the selection, installation, inspection, maintenance, and testing of portable extinguishing equipment.

1.1.1 Portable fire extinguishers are intended as a first line of defense to cope with fires of limited size.

1.1.2 The selection and installation of extinguishers is independent of whether the building is equipped with automatic sprinklers, standpipe and hose, or other fixed protection equipment. (See 5.5.5, 6.1.1.1, 6.2.1.1, and 6.2.1.5.)

1.1.3 The requirements given herein are minimum.

1.1.4 The requirements do not apply to permanently installed systems for fire extinguishment, even where portions of such systems are portable (such as hose and nozzles attached to a fixed supply of extinguishing agent).

1.2* Purpose. This standard is prepared for use by and guidance of persons charged with selecting, purchasing, installing, approving, listing, designing, and maintaining portable fire extinguishing equipment.

cific requirements of other NFPA standards for specific occupancies.

1.2.2 Nothing in this standard shall be construed as a restriction on new technologies or alternative arrangements, provided that the level of protection as herein described is not lowered and is acceptable to the authority having jurisdiction.

1.3 Units.

1.3.1 Metric units of measurement in this standard are in accordance with the modernized metric system known as the International System of Units (SI).

1.3.1.1 The units are listed in Table 1.3.1.1 with conversion factors.

Table 1.3.1.1 Metric Units of Measurement

Name of Unit	Abbreviation	Conversion Factor
Liter	L	1 gal = 3.785 L
Millimeter	mm	1 in. = 25.4 mm
Meter	m	1 ft = 0.305 m
Kilogram	kg	1 lb (mass) = 0.454 kg
Degree Celsius	°C	$\frac{5}{9}(\text{°F} - 32) = \text{°C}$
Bar	bar	1 psi = 0.0689 bar

1.3.1.2 If a value for measurement as given in this standard is followed by an equivalent value in other units, the first stated is to be regarded as the requirement.

1.3.1.3 A given equivalent value shall be permitted to be considered approximate.

1.3.2 The conversion procedure for the SI units is to multiply the quantity by the conversion factor and then round the result to the appropriate number of significant digits.

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*, 2010 edition.

NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages*, 2008 edition.

NFPA 32, *Standard for Drycleaning Plants*, 2007 edition.

NFPA 58, *Liquefied Petroleum Gas Code*, 2008 edition.

NFPA 72[®], *National Fire Alarm and Signaling Code*, 2010 edition.

NFPA 86, *Standard for Ovens and Furnaces*, 2007 edition.

NFPA 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations*, 2008 edition.

NFPA 120, *Standard for Fire Prevention and Control in Coal Mines*, 2010 edition.

NFPA 122, *Standard for Fire Prevention and Control in Metal/Nonmetal Mining and Metal Mineral Processing Facilities*, 2010 edi-

Table 6.3.1.1 Fire Extinguisher Size and Placement for Class B Hazards

Type of Hazard	Basic Minimum Extinguisher Rating	Maximum Travel Distance to Extinguishers	
		ft	m
Light (low)	5-B	30	9.14
	10-B	50	15.25
Ordinary (moderate)	10-B	30	9.14
	20-B	50	15.25
Extra (high)	40-B	30	9.14
	80-B	50	15.25

Notes:

(1) The specified ratings do not imply that fires of the magnitudes indicated by these ratings will occur, but rather they are provided to give the operators more time and agent to handle difficult spill fires that have the potential to occur.

(2) For fires involving water-soluble flammable liquids, see 5.5.3.

(3) For specific hazard applications, see Section 5.5.

6.3.1.5 Two or more fire extinguishers of lower rating shall not be used to fulfill the protection requirements of Table 6.3.1.1 except as permitted by 6.3.1.3 and 6.3.1.4.

6.3.1.6 The protection requirements shall be permitted to be fulfilled with fire extinguishers of higher ratings, provided the travel distance to such larger fire extinguishers does not exceed 50 ft (15.25 m).

6.3.2 Flammable Liquids of Appreciable Depth.

6.3.2.1 Portable fire extinguishers shall not be installed as the sole protection for flammable liquid hazards of appreciable depth where the surface area exceeds 10 ft² (0.93 m²).

6.3.2.2* Where personnel who are trained in extinguishing fires in the protected hazards are located on the premises and capable of responding immediately, the maximum surface area shall not exceed 20 ft² (1.86 m²).

6.3.2.3 For flammable liquid hazards of appreciable depth, a Class B fire extinguisher shall be provided on the basis of at least 2 numerical units of Class B extinguishing potential per 1 ft² (0.09 m²) of flammable liquid surface of the largest hazard area.

6.3.2.4 AFFF- or FFFP-type fire extinguishers shall be permitted to be provided on the basis of 1-B of protection per 1 ft² (0.09 m²) of hazard. (For fires involving water-soluble flammable liquids, see 5.5.3.)

6.3.2.5 Two or more fire extinguishers of lower ratings, other than AFFF- or FFFP-type fire extinguishers, shall not be used in lieu of the fire extinguisher required for the largest hazard area.

6.3.2.6 Up to three AFFF- or FFFP-type fire extinguishers shall be permitted to fulfill the requirements, provided the sum of the Class B ratings meets or exceeds the value required for the largest hazard area.

6.3.2.7 Travel distances for portable fire extinguishers shall not exceed 50 ft (15.25 m). (See Annex E.)

6.3.2.7.1 Scattered or widely separated hazards shall be individually protected.

6.3.2.7.2 A fire extinguisher in the proximity of a hazard shall be located to be accessible in the presence of a fire without undue danger to the operator.

6.4* Installations for Class C Hazards.

6.4.1 Fire extinguishers with Class C ratings shall be required where energized electrical equipment can be encountered.

6.4.2 The requirement in 6.4.1 shall include situations where fire either directly involves or surrounds electrical equipment.

6.4.3 Because fire is a Class A or Class B hazard, the fire extinguishers shall be sized and located on the basis of the anticipated Class A or Class B hazard.

6.5 Installations for Class D Hazards.

6.5.1 Fire extinguishers or extinguishing agents with Class D ratings shall be provided for fires involving combustible metals.

6.5.2 Fire extinguishers or extinguishing agents (media) shall be located not more than 75 ft (22.9 m) of travel distance from the Class D hazard. (See Section E.6.)

6.5.3 Portable fire extinguishers or extinguishing agents (media) for Class D hazards shall be provided in those work areas where combustible metal powders, flakes, shavings, chips, or similarly sized products are generated.

6.5.4 Size determination shall be on the basis of the specific combustible metal, its physical particle size, area to be covered, and recommendations by the fire extinguisher manufacturer based on data from control tests.

6.6 Installations for Class K Hazards.

6.6.1 Class K fire extinguishers shall be provided for hazards where there is a potential for fires involving combustible cooking media (vegetable or animal oils and fats).

6.6.2 Maximum travel distance shall not exceed 30 ft (9.15 m) from the hazard to the extinguishers.

6.6.3 All solid fuel cooking appliances (whether or not under a hood) with fire boxes of 5 ft³ (0.14 m³) volume or less shall have at least a listed 2-A rated water-type fire extinguisher or a 1.6 gal (6 L) wet chemical fire extinguisher that is listed for Class K fires.

Chapter 7 Inspection, Maintenance, and Recharging of Portable Fire Extinguishers

7.1* General.

7.1.1 Responsibility. The owner or designated agent or occupant of a property in which fire extinguishers are located shall be responsible for inspection, maintenance, and recharging. (See 7.1.2.)

7.1.2 Personnel.

7.1.2.1* Persons performing maintenance and recharging of extinguishers shall be certified.

7.1.2.1.1 Persons training to become certified shall be permitted to perform maintenance and recharging of extinguishers under the direct supervision and in the immediate presence of a certified person.

7.1.2.1.2* Certification requires that a person pass a test administered by an organization acceptable to the AHJ.

7.1.2.1.3 The test shall at a minimum be based upon knowledge of the chapters and annexes of this standard.

7.1.2.1.4 The testing process shall permit persons to use the standard during the test.

7.1.2.1.5 Persons passing the test required in 7.1.2.1.2 shall be issued a document or a certificate.

7.1.2.1.6 The document or certificate shall be made available when requested by the authority having jurisdiction.

7.1.2.2 Persons performing maintenance and recharging of extinguishers shall be trained and shall have available the appropriate manufacturer's servicing manual(s), the correct tools, recharge materials, lubricants, and manufacturer's replacement parts or parts specifically listed for use in the fire extinguisher.

7.1.2.3* Persons performing 30-day inspections shall not be required to be certified.

7.1.3 Replacement While Servicing. Fire extinguishers removed from service for maintenance or recharging shall be replaced by a fire extinguisher suitable for the type of hazard being protected and shall be of at least equal rating.

7.1.4 Tags or Labels.

7.1.4.1 Tags or labels intended for recording inspections, maintenance, or recharging shall not be placed on the front of the fire extinguishers.

7.1.4.2 Labels indicating fire extinguisher use or classification or both shall be permitted to be placed on the front of the fire extinguisher.

7.1.5 Electronic Monitoring Systems.

7.1.5.1 When used in conjunction with fire alarm systems, fire extinguisher electronic monitoring devices shall be inspected and maintained in accordance with *NFPA 72, National Fire Alarm and Signaling Code*, and 7.3.2.5.

7.1.5.2 When used in conjunction with non-fire alarm systems, fire extinguisher electronic monitoring devices shall be inspected and maintained as required in 7.1.5.2.1 through 7.1.5.2.3 and the manufacturer's listed installation and maintenance manual(s).

7.1.5.2.1 The connection to the electronic monitoring device shall be continuously supervised for integrity.

7.1.5.2.2 The power source for the electronic monitoring device shall be supervised for continuity of power.

7.1.5.2.3 The monitoring device shall be tested and maintained annually in accordance with 7.3.2.5.

7.2 Inspection.

7.2.1 Frequency.

7.2.1.1* Fire extinguishers shall be manually inspected when initially placed in service.

7.2.1.2* Fire extinguishers shall be inspected either manually or by means of an electronic monitoring device/system at a minimum of 30-day intervals.

7.2.1.3* Fire extinguishers shall be inspected at more frequent intervals when circumstances require.

7.2.2 Procedures. Periodic inspection or electronic monitoring of fire extinguishers shall include a check of at least the following items:

- (1) Location in designated place
- (2) No obstruction to access or visibility
- (3) Pressure gauge reading or indicator in the operable range or position
- (4) Fullness determined by weighing or hefting for self-expelling-type extinguishers, cartridge-operated extinguishers, and pump tanks
- (5) Condition of tires, wheels, carriage, hose, and nozzle for wheeled extinguishers
- (6) Indicator for nonrechargeable extinguishers using push-to-test pressure indicators

7.2.2.1 In addition to 7.2.2, fire extinguishers shall be visually inspected in accordance with 7.2.2.2 if they are located where any of the following conditions exists:

- (1) High frequency of fires in the past
- (2) Severe hazards
- (3) Locations that make fire extinguishers susceptible to mechanical injury or physical damage
- (4) Exposure to abnormal temperatures or corrosive atmospheres

7.2.2.2 Where required by 7.2.2.1, the following inspection procedures shall be in addition to those addressed in 7.2.2:

- (1) Verifying that operating instructions on nameplates are legible and face outward
- (2) Checking for broken or missing safety seals and tamper indicators
- (3) Examination for obvious physical damage, corrosion, leakage, or clogged nozzle

7.2.3 Corrective Action. When an inspection of any fire extinguisher reveals a deficiency in any of the conditions listed in 7.2.2, immediate corrective action shall be taken.

7.2.3.1 Rechargeable Fire Extinguishers. When an inspection of any rechargeable fire extinguisher reveals a deficiency in any of the conditions listed in 7.2.2(3) or 7.2.2(4), the extinguisher shall be subjected to applicable maintenance procedures.

7.2.3.2 Nonrechargeable Dry Chemical Fire Extinguisher. When an inspection of any nonrechargeable dry chemical fire extinguisher reveals a deficiency in any of the conditions listed in 7.2.2(3), 7.2.2(4), or 7.2.2(6), the extinguisher shall be removed from further use, discharged, and destroyed at the direction of the owner or returned to the manufacturer.

7.2.3.3 Nonrechargeable Halon Agent Fire Extinguisher. When an inspection of any nonrechargeable fire extinguisher containing a halon agent reveals a deficiency in any of the conditions listed in 7.2.2(3), 7.2.2(4), or 7.2.2(6), the extinguisher shall be removed from service, not discharged, and returned to the manufacturer, a fire equipment dealer, or a distributor to permit recovery of the halon.

7.2.4 Inspection Record Keeping.

NFPA 72

National Fire Alarm and Signaling Code

2010 Edition

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A reference in parentheses () following a paragraph indicates the committee responsibility for that section or paragraph. Committee acronyms are keyed to the acronyms shown with the committee lists at the front of the document.

Information on referenced publications can be found in Chapter 2 and Annex H.

Chapter 1 Administration

1.1 Scope.

1.1.1 NFPA 72 covers the application, installation, location, performance, inspection, testing, and maintenance of fire alarm systems, supervising station alarm systems, public emergency alarm reporting systems, fire warning equipment and emergency communications systems (ECS), and their components.

1.1.2 The provisions of this chapter apply throughout the Code unless otherwise noted.

1.2* Purpose.

1.2.1 The purpose of this Code is to define the means of signal initiation, transmission, notification, and annunciation; the levels of performance; and the reliability of the various types of fire alarm systems, supervising station alarm systems, public emergency alarm reporting systems, fire warning equipment, emergency communications systems, and their components.

1.2.2 This Code defines the features associated with these systems and also provides information necessary to modify or upgrade an existing system to meet the requirements of a particular system classification.

1.2.3 This Code establishes minimum required levels of performance, extent of redundancy, and quality of installation but does not establish the only methods by which these requirements are to be achieved.

1.2.4* This Code shall not be interpreted to require a level of protection that is greater than that which would otherwise be required by the applicable building or fire code.

1.3 Application.

1.3.1 Alarm systems shall be classified as follows:

- (1) Fire alarm systems
 - (a) Household fire alarm systems
 - (b) Protected premises (local) fire alarm systems
- (2) Supervising station alarm systems
 - (a) Central station (service) alarm systems
 - (b) Remote supervising station alarm systems
 - (c) Proprietary supervising station alarm systems
- (3) Public emergency alarm reporting systems
 - (a) Auxiliary alarm systems — local energy type
 - (b) Auxiliary alarm systems — shunt type

1.3.2 Emergency communications systems shall be classified as follows:

- (1) One-way emergency communications systems
 - (a) Distributed recipient mass notification systems
 - (b) In-building fire emergency voice/alarm communications systems
 - (c) In-building mass notification systems
 - (d) Wide area mass notification systems
- (2) Two-way emergency communications systems
 - (a) In-building emergency communications systems

1.3.3 Any reference or implied reference to a particular type of hardware shall be for the purpose of clarity and shall not be interpreted as an endorsement.

1.3.4 The intent and meaning of the terms used in this Code shall be, unless otherwise defined herein, the same as those of NFPA 70, *National Electrical Code*[®].

1.4 Retroactivity.

1.4.1 Unless otherwise noted, it is not intended that the provisions of this document be applied to facilities, equipment, structures, or installations that were existing or approved for construction or installation prior to the effective date of the document.

1.4.2 In those cases where it is determined by the authority having jurisdiction that the existing situation involves a distinct hazard to life or property, retroactive application of the provisions of this document shall be permitted.

1.5 Equivalency.

1.5.1 Nothing in this Code shall prevent the use of systems, methods, devices, or appliances of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this Code.

NFPA 13
Standard for the
Installation of Sprinkler Systems
2010 Edition

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Information on referenced publications can be found in Chapter 2 and Annex F.

Chapter 1 Administration

1.1* Scope.

1.1.1 This standard shall provide the minimum requirements for the design and installation of automatic fire sprinkler systems and exposure protection sprinkler systems covered within this standard.

1.1.2 This standard is written with the assumption that the sprinkler system shall be designed to protect against a single fire originating within the building.

1.2* Purpose.

1.2.1 The purpose of this standard shall be to provide a reasonable degree of protection for life and property from fire through standardization of design, installation, and testing requirements for sprinkler systems, including private fire service mains, based on sound engineering principles, test data, and field experience.

1.2.2 Sprinkler systems and private fire service mains are specialized fire protection systems and shall require knowledgeable and experienced design and installation.

1.3 Application.

1.3.1 This standard shall apply to the following:

- (1) Character and adequacy of water supplies
- (2) Selection of sprinklers
- (3) Fittings
- (4) Piping
- (5) Valves
- (6) All materials and accessories, including the installation of private fire service mains

1.3.2 This standard shall also apply to "combined service mains" used to carry water for both fire service and other uses as well as to mains for fire service use only.

1.4 Retroactivity. The provisions of this standard reflect a consensus of what is necessary to provide an acceptable degree of protection from the hazards addressed in this standard at the time the standard was issued.

1.4.1 Unless otherwise specified, the provisions of this standard shall not apply to facilities, equipment, structures, or installations that existed or were approved for construction or installation prior to the effective date of the standard. Where specified, the provisions of this standard shall be retroactive.

1.4.2 In those cases where the authority having jurisdiction determines that the existing situation presents an unacceptable degree of risk, the authority having jurisdiction shall be permitted to apply retroactively any portions of this standard deemed appropriate.

1.4.3 The retroactive requirements of this standard shall be permitted to be modified if their application clearly would be impractical in the judgment of the authority having jurisdiction, and only where it is clearly evident that a reasonable degree of safety is provided.

1.5 Equivalency. Nothing in this standard is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this standard.

1.5.1 Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.

1.5.2 The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.

1.6 New Technology.

1.6.1 Nothing in this standard shall be intended to restrict new technologies or alternate arrangements, provided the level of safety prescribed by this standard is not lowered.

1.6.2 Materials or devices not specifically designated by this standard shall be utilized in complete accord with all conditions, requirements, and limitations of their listings.

1.7 Units and Symbols.

1.7.1 Units.

1.7.1.1 Metric units of measurement in this standard shall be in accordance with the modernized metric system known as the International System of Units (SI).

1.7.1.2 Two units (liter and bar), outside of but recognized by SI, are commonly used in international fire protection.

1.7.1.3 These units with conversion factors shall be used as listed in Table 1.7.1.3.

1.7.1.4 If a value for measurement as given in this standard is followed by an equivalent value in other units, the first stated shall be regarded as the requirement.

25.7.3.12.2 In addition, a system that is required to have more than one pump shall be designed to accommodate the following features:

- (1)*Pump controls and system sensors shall be arranged such that the secondary pump will automatically operate if the primary pump fails to operate or deliver the required water pressure and flow. [Figure A.25.7.3.12.2(1) is an example of an acceptable dual pump arrangement.]
- (2) Both pumps shall be served from normal and emergency power sources. However, where approved by the authority having jurisdiction, the secondary pump shall be permitted to be nonelectrically driven.
- (3) Pump failure or operation shall be indicated at the central safety station.

25.7.3.13* If not specifically prohibited, the fire pump that supplies the fire main shall be permitted to be used as the second pump, provided the following conditions are met:

- (1) The pump is adequately sized to meet the required fire hose and sprinkler system pressure and flow demands simultaneously.
- (2) The fire main system is segregated from the sprinkler system by a normally closed valve that is designed to automatically open upon failure of the designated fire pump.
- (3) The fire pump that supplies the fire main is automatically started in the event of dedicated fire pump failure or loss of pressure in the sprinkler main. (See Figure A.25.7.3.13.)

25.7.4 Water Supply Configurations.

25.7.4.1 The pressure tank and fire pump shall be located in a position reasonably remote from any machinery space of Category A.

25.7.4.2 All valves within the water supply piping system shall be supervised.

25.7.4.3 Only freshwater shall be used as the initial charge within the piping network.

25.7.4.4 The sprinkler system shall be cross-connected with the ship's fire main system and fitted with a lockable screw-down nonreturn valve such that backflow from the sprinkler system to the fire main is prevented.

25.7.4.5 The piping, tanks, and pumps that make up the water supply shall be installed in accordance with the applicable requirements of 46 CFR, Subchapter F, "Marine Engineering."

25.7.4.6* When a shore water supply is to be used during extended dockside periods, the water supply shall be qualified in the manner described in 23.2.1.

25.7.4.7 Tests shall be conducted in accordance with the requirements of the local shore-based authority having jurisdiction.

25.7.4.8 The water supply information listed in Section 11.3 shall then be provided to the authority having jurisdiction.

25.8 System Acceptance.

25.8.1 Hydrostatic Tests. In addition to the interior piping, the test required by 24.2.1.10 shall also be conducted on all external water supply connections including international shore and fireboat connections.

25.8.2 Alarm Test. A waterflow test shall result in an alarm at the central safety station within 30 seconds after flow through the test connection begins.

25.8.3 Operational Tests.

25.8.3.1 Pressure tank and pump operation, valve actuation, and waterflow shall also be tested.

25.8.3.2 Pump operation and performance shall be tested in accordance with Chapter 14 of NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection*.

25.9 System Instructions and Maintenance.

25.9.1 Instructions for operation, inspection, maintenance, and testing shall be kept on the vessel.

25.9.2 Records of inspections, tests, and maintenance required by NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, shall also be kept on the vessel.

Chapter 26 System Inspection, Testing, and Maintenance

26.1* General. A sprinkler system installed in accordance with this standard shall be properly inspected, tested, and maintained by the property owner or their authorized representative in accordance with NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, to provide at least the same level of performance and protection as designed.

26.2* Inactive Sprinkler Systems Abandoned in Place.

26.2.1 Where all or part of an inactive sprinkler system is abandoned in place, components including sprinklers, hose valves and hoses, and alarm devices shall be removed.

26.2.2 Control valves abandoned in place shall have the operating mechanisms removed.

26.2.3 Sprinkler system piping and/or valves abandoned in place shall be uniquely identified to differentiate them from active system piping and valves.

Annex A Explanatory Material

Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

A.1.1 This standard provides a range of sprinkler system approaches, design development alternatives, and component options that are all acceptable. Building owners and their designated representatives are advised to carefully evaluate proposed selections for appropriateness and preference.

A.1.2 Since its inception, this document has been developed on the basis of standardized materials, devices, and design practices. However, Section 1.2 and other subsections such as 6.3.6 and 8.4.8 allow the use of materials and devices not specifically designated by this standard, provided such use is within parameters established by a listing organization. In using such materials or devices, it is important that all conditions, requirements, and limitations of the listing be fully understood and accepted and that the installation be in complete accord with such listing requirements.

NFPA 13R

Standard for the

Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height

2007 Edition

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Changes other than editorial are indicated by a vertical rule beside the paragraph, table, or figure in which the change occurred. These rules are included as an aid to the user in identifying changes from the previous edition. Where one or more complete paragraphs have been deleted, the deletion is indicated by a bullet (•) between the paragraphs that remain.

Information on referenced publications can be found in Chapter 2 and Annex B.

Chapter 1 Administration

1.1* Scope. This standard shall cover the design and installation of automatic sprinkler systems for protection against fire hazards in residential occupancies up to and including four stories in height.

1.2* Purpose. The purpose of this standard shall be to provide design and installation requirements for a sprinkler system to aid in the detection and control of fires in residential occupancies and thus provide improved protection against injury, life loss, and property damage. A sprinkler system designed and installed in accordance with this standard shall be expected to prevent flashover (total involvement) in the room of fire origin, where sprinklered, and to improve the chance for occupants to escape or be evacuated.

1.3 Retroactivity. The provisions of this standard reflect a consensus of what is necessary to provide an acceptable degree of protection from the hazards addressed in this standard at the time the standard was issued. Unless otherwise specified, the provisions of this standard shall not apply to facilities, equipment, structures, or installations that existed or were approved for construction or installation prior to the effective date of the standard. Where specified, the provisions of this standard shall be retroactive. In those cases where the authority having jurisdiction determines that the existing situation presents an unacceptable degree of risk, the authority having jurisdiction shall be permitted to apply retroactively any portions of this standard deemed appropriate. The retroactive requirements of this standard shall be permitted to be modified if their application clearly would be impractical in the judgment of the authority having jurisdiction, and only where it is clearly evident that a reasonable degree of safety is provided.

1.4 Equivalency. Nothing in this standard is intended to restrict new technologies or alternative arrangements, provided that the level of safety prescribed by the standard is not reduced.

1.5 Units.

1.5.1* Metric units of measurement in this standard shall be in accordance with the modernized metric system known as the International System of Units (SI).

1.5.2 The liter and bar units shall be permitted to be used in this standard.

1.5.3 The conversion factors for liter, pascal, and bar shall be in accordance with Table 1.5.3.

Table 1.5.3 Metric Conversions

Name of Unit	Unit Symbol	Conversion Factor
liter	L	1 gal = 3.785 L
pascal	Pa	1 psi = 6894.757 Pa
bar	bar	1 psi = 0.0689 bar
bar	bar	1 bar = 10 ⁵ Pa

1.5.4* Where a value for measurement as specified in this standard is followed by an equivalent value in other units, the first stated value shall be regarded as the requirement.

1.5.5 The equivalent value for a measurement in SI shall be converted by multiplying the value by the conversion factor and then rounding the result to the appropriate number of significant digits.

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 13, *Standard for the Installation of Sprinkler Systems*, 2007 edition.

NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection*, 2007 edition.

NFPA 22, *Standard for Water Tanks for Private Fire Protection*, 2003 edition.

NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, 2002 edition.

NFPA 101[®], *Life Safety Code*[®], 2006 edition.

NFPA 220, *Standard on Types of Building Construction*, 2006 edition.

NFPA 251, *Standard Methods of Tests of Fire Resistance of Building Construction and Materials*, 2006 edition.

2.3 Other Publications.

2.3.1 ANSI Publications. American National Standards Institute, Inc., 25 West 43rd Street, 4th Floor, New York, NY 10036.

ANSIA17.1, *Safety Code for Elevators and Escalators*, 2004.

ANSI B36.10M, *Welded and Seamless Wrought Steel Pipe*, 1996.

6.9.4 Sprinklers shall be installed in any closet used for heating and air-conditioning equipment.

6.9.5 Sprinklers shall not be required in any porches, balconies, corridors, and stairs that are open and attached.

6.9.6* Sprinklers shall not be required in attics, penthouse equipment rooms, elevator machine rooms, concealed spaces dedicated exclusively to and containing only dwelling unit ventilation equipment, crawl spaces, floor/ceiling spaces, noncombustible elevator shafts where the elevator cars comply with ANSI A17.1, *Safety Code for Elevators and Escalators*, and other concealed spaces that are not used or intended for living purposes or storage and do not contain fuel-fired equipment.

6.9.7 Sprinklers shall not be required in closets on exterior balconies, regardless of size, as long as there are no doors or unprotected penetrations from the closet directly into the dwelling unit.

6.10* Maintenance.

6.10.1 The owner shall be responsible for the condition of a sprinkler system and shall keep the system in normal operating condition.

6.10.2 Sprinkler systems shall be inspected, tested, and maintained in accordance with NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*.

A.1.1 NFPA 13R is appropriate for use as an option to NFPA 13, *Standard for the Installation of Sprinkler Systems*, only in those residential occupancies, as defined in this standard, up to and including four stories in height. It is the intent of this standard that if NFPA 13R is appropriate for use, that it be used throughout the entire building. It is recognized that an occupancy incidental to the operations of the residential occupancy might exist within that residential occupancy. Such incidental occupancy would be considered part of the predominant (residential) occupancy and subject to the provisions of the predominant (residential) occupancy by 6.1.14.2 of NFPA 101, *Life Safety Code*, and similar provisions in many local building and fire codes. Use of NFPA 13R throughout the entire building in this case is allowed.

Where buildings are greater than four stories in height, or where buildings are of mixed use where residential is not the predominant occupancy, residential portions of such buildings should be protected with residential or quick-response sprinklers in accordance with 8.4.5 of NFPA 13. Other portions of such buildings should be protected in accordance with NFPA 13. Where buildings of mixed use can be totally separated so that the residential portion is considered a separate building under the local code, NFPA 13R can be used in the residential portion while NFPA 13 is used in the rest of the building.

The criteria in this standard are based on full-scale fire tests of rooms containing typical furnishings found in residential living rooms, kitchens, and bedrooms. The furnishings were arranged as typically found in dwelling units in a manner similar to that shown in Figure A.1.1(a), Figure A.1.1(b), and Figure A.1.1(c). Sixty full-scale fire tests were conducted in a two-story dwelling in Los Angeles, California, and 16 tests were conducted in a 14 ft (4.3 m) wide mobile home in Charlotte, North Carolina. Sprinkler systems designed and installed according to this standard are

Annex A Explanatory Material

Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

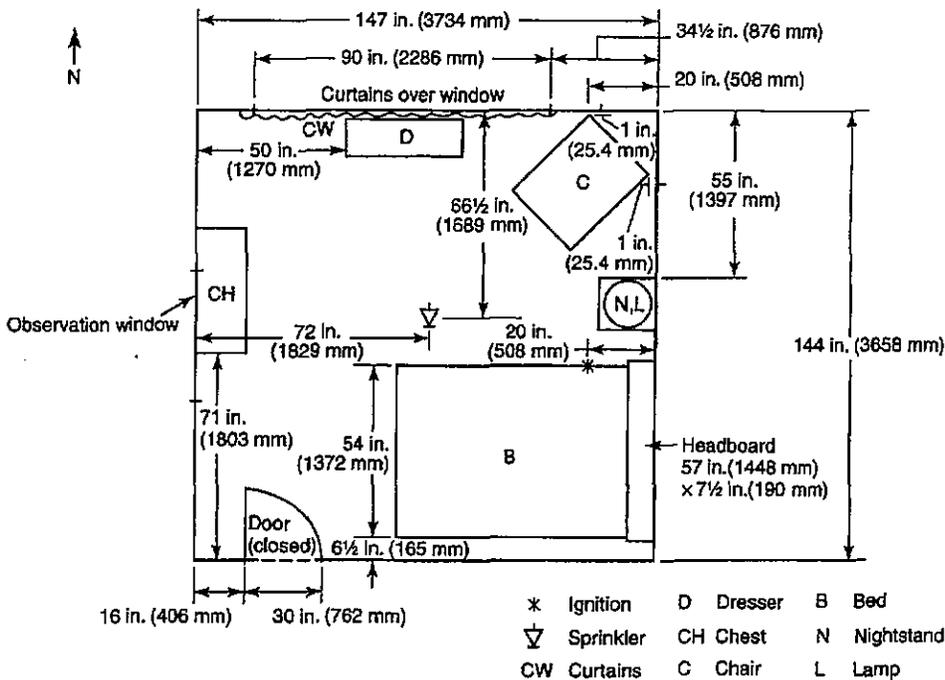


FIGURE A.1.1(a) Bedroom.

NFPA 13D

Standard for the

Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes

2002 Edition

NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

Changes other than editorial are indicated by a vertical rule beside the paragraph, table, or figure in which the change occurred. These rules are included as an aid to the user in identifying changes from the previous edition. Where one or more complete paragraphs have been deleted, the deletion is indicated by a bullet between the paragraphs that remain.

Information on referenced publications can be found in Chapter 2 and Annex B.

Chapter 1 Administration

1.1* Scope. This standard shall cover the design and installation of automatic sprinkler systems for protection against the fire hazards in one- and two-family dwellings and manufactured homes.

1.2* Purpose. 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, life loss, and property damage. A sprinkler system designed and installed in accordance with this standard shall be expected to prevent flashover (total involvement) in the room of fire origin, where sprinklered, and to improve the chance for occupants to escape or be evacuated. The layout, calculation, and installation of systems installed in accordance with this standard shall only be performed by people knowledgeable and trained in such systems.

1.3 Retroactivity The provisions of this standard reflect a consensus of what is necessary to provide an acceptable degree of protection from the hazards addressed in this standard at the time the standard was issued. Unless otherwise specified, the provisions of this standard shall not apply to facilities, equipment, structures, or installations that existed or were approved for construction or installation prior to the effective date of the standard. Where specified, the provisions of this standard shall be retroactive. In those cases where the authority having jurisdiction determines that the existing situation presents an unacceptable degree of risk, the authority having jurisdiction shall be permitted to apply retroactively any portions of this standard deemed appropriate. The retroactive requirements of this standard shall be permitted to be modified if their application clearly would be impractical in the judgment of the authority having jurisdiction, and only where it is clearly evident that a reasonable degree of safety is provided.

1.4 Equivalency. Nothing in this standard is intended to restrict new technologies or alternative arrangements, pro-

vided that the level of safety prescribed by the standard is not reduced.

1.5 Units.

1.5.1* Metric units of measurement in this standard shall be in accordance with the modernized metric system known as the International System of Units (SI).

1.5.2 The liter and bar units shall be permitted to be used in this standard.

1.5.3 The conversion factors for liter, pascal, and bar shall be in accordance with Table 1.5.3.

Table 1.5.3 Metric Conversions

Name of Unit	Unit Symbol	Conversion Factor
liter	L	1 gal = 3.785 L
pascal	Pa	1 psi = 6894.757 Pa
bar	bar	1 psi = 0.0689 bar
bar	bar	1 bar = 10 ⁵ Pa

1.5.4* Where a value for measurement as specified in this standard is followed by an equivalent value in other units, the first stated value shall be regarded as the requirement.

1.5.5 The equivalent value for a measurement in SI shall be converted by multiplying the value by the conversion factor and then rounding the result to the appropriate number of significant digits.

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

NFPA 13, *Standard for the Installation of Sprinkler Systems*, 2002 edition.

NFPA 72®, *National Fire Alarm Code*®, 2002 edition.

NFPA 220, *Standard on Types of Building Construction*, 1999 edition.

2.3 Other Publications.

2.3.1 ANSI Publication. American National Standards Institute, Inc., 11 West 42nd Street, 13th floor, New York, NY 10036.

ANSI B36.10M, *Welded and Seamless Wrought Steel Pipe*, 1996.

2.3.2 ASME Publications. American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016-5990.

ASME B16.1, *Cast Iron Pipe Flanges and Flanged Fittings*, 1989.

ASME B16.3, *Malleable Iron Threaded Fittings*, 1992.

ASME B16.4, *Gray Iron Threaded Fittings*, 1992.

ASME B16.5, *Pipe Flanges and Flanged Fittings*, 1996.

ASME B16.9, *Factory-Made Wrought Steel Butt Welding Fittings*, 1993.

ASME B16.11, *Forged Fittings, Socket-Welding and Threaded*, 1996.

projections containing interior space, but do not include bay windows.

3.3.6 Pressure.

3.3.6.1 Supply Pressure. The pressure within the supply (e.g., city or private supply water source).

3.3.6.2 System Pressure. The pressure within the system (e.g., above the control valve).

3.3.6.3 System Working Pressure. The maximum anticipated static (nonflowing) or flowing pressure applied to sprinkler system components exclusive of surge pressures.

3.3.7 Pump. A mechanical device that transfers or raises, or transfers and raises, the pressure of a fluid (water).

3.3.8 Sprinkler.

3.3.8.1 Automatic Sprinkler. A fire suppression or control device that operates automatically when its heat-actuated element is heated to its thermal rating or above, allowing water to discharge over a specific area.

3.3.8.2 Residential Sprinkler. A type of fast-response sprinkler that meets the criteria of NFPA 13, *Standard for the Installation of Sprinkler Systems*, that has been specifically investigated for its ability to enhance survivability in the room of fire origin and is listed for use in the protection of dwelling units.

3.3.9 Systems.

3.3.9.1 Antifreeze System. An antifreeze system is an automatic sprinkler system containing an antifreeze solution and connected to a water supply. The antifreeze solution, followed by water, discharges immediately from sprinklers opened by a fire.

3.3.9.2 Dry Pipe Sprinkler System. A sprinkler system employing automatic sprinklers that are attached to a piping system containing air or nitrogen under pressure, the release of which (as from the opening of a sprinkler) permits the water pressure to open a valve known as a dry pipe valve, and the water then flows into the piping system and out the opened sprinkler.

3.3.9.3 Multipurpose Piping System. A piping system within a residential occupancy intended to serve both domestic and fire protection needs.

3.3.9.4 Network System. A type of multipurpose system utilizing a common piping system supplying domestic fixtures and fire sprinklers where each sprinkler is supplied by a minimum of three separate paths.

3.3.9.5 Preaction Sprinkler System. A sprinkler system employing automatic sprinklers that are attached to a piping system that contains air that might or might not be under pressure, with a supplemental detection system installed in the same areas as the sprinklers.

3.3.9.6 Preengineered System. A packaged sprinkler system including all components connected to the water supply and designed to be installed according to pretested limitations.

3.3.9.7 Sprinkler System. For fire protection purposes, an integrated system of underground and overhead piping designed in accordance with fire protection engineering standards. The installation includes one or more automatic water supplies. The portion of the sprinkler system aboveground is a network of specially sized or hydraulically designed piping installed in a building, structure, or area, generally overhead,

and to which sprinklers are attached in a systematic pattern. The system is usually activated by heat from a fire and discharges water over the fire area.

3.3.9.8 Wet Pipe Sprinkler System. A sprinkler system employing automatic sprinklers attached to a piping system containing water and connected to a water supply so that water discharges immediately from sprinklers opened by heat from a fire.

3.3.10 Valve.

3.3.10.1 Check Valve. A valve that allows flow in one direction only.

3.3.10.2* Control Valve. A valve employed to control (shut) a supply of water to a sprinkler system.

3.3.11 Waterflow Alarm. A sounding device activated by a waterflow detector or alarm check valve.

3.3.12 Waterflow Detector. An electric signaling indicator or alarm check valve actuated by waterflow in one direction only.

Chapter 4 General Requirements

4.1 Compartments.

4.1.1 A compartment, for the purposes of this standard, shall be a space that is completely enclosed by walls and a ceiling.

4.1.2 A compartment enclosure shall be permitted to have openings in walls, provided the openings have a minimum lintel depth of 8 in. (203 mm) from the ceiling.

4.2 Maintenance.

4.2.1* The installer shall provide to the owner/occupant instructions on inspecting, testing, and maintaining the system.

4.2.2 Operated or damaged sprinklers shall be replaced with sprinklers having the same performance characteristics as the original equipment.

4.2.3 Any sprinklers that have been painted outside of the factory shall be replaced with a new listed sprinkler.

4.2.4* Antifreeze Systems. Before freezing weather each year, the following procedure shall be performed:

- (1) Solution in the entire antifreeze system emptied into convenient containers
- (2) Solution brought to the proper specific gravity by adding concentrated liquid as needed, or a new solution be prepared, in accordance with 8.3.3
- (3) System refilled with the new or remixed solution

4.3* Hydrostatic Tests.

4.3.1 Where a fire department pumper connection is not provided, the system shall be hydrostatically tested for leakage at normal system operating pressure.

4.3.2 Where a fire department pumper connection is provided, the system shall pass a hydrostatic pressure test performed in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*.

4.4 Sprinkler Temperature Ratings.

4.4.1 Sprinklers having a temperature rating of 135°F to 170°F (57°C to 77°C) shall be classified as ordinary temperature-rated sprinklers.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Ed Altizer

Representing: State Fire Marshal's Office

Mailing Address: 1005 Technology Park Drive

Email Address: ed.altizer@vdfp.virginia.gov

Telephone Number: 804-371-0220

Proposal Information

Code(s) and Section(s): SFPC Sections 107.5.1, 107.6, and 107.13

Proposed Change (including all relevant section numbers, if multiple sections):

Delete and relocate with modifications as follows:

~~107.5.1 Specials conditions for the State Fire Marshal's Office: Permits issued by the State Fire Marshal's Office for the use of explosives in special operations or under emergency conditions shall be valid for 1 week from the date of issuance and shall not be renewable.~~

~~107.6 State Fire Marshal: Permits will not be required by the State Fire Marshal except those permits listed in Section 107.13 and 107.14 of this code.~~

~~Exception: Such permits shall not be required for the storage of explosives or blasting agents by the Virginia Department of State Police provided notification to the State Fire Marshal is made annually by the Chief Arson Investigator listing all storage locations within areas where enforcement is provided by the State Fire Marshal's office.~~

Change to read as follows:

107.13. State explosives, blasting agents, theatrical flame effects and firework permit fees: Except as modified herein, Applications for firework or pyrotechnic displays shall be submitted to and received by the State Fire Marshal's Office not less than 15 days prior to the planned event. Fees for permits issued by the State Fire Marshal's office for the storage, use, sale or manufacture of explosives or blasting agents, and for the display of fireworks and flame effects on state-owned property shall be as follows: State Fire Marshal's Office permit fees shall be as follows:

1. \$125 per year per magazine to store explosives and blasting agents.
2. \$200 per year per city or county to use explosives and blasting agents.
3. \$150 per year to sell explosives and blasting agents.
4. \$200 per year to manufacture explosives, blasting agents and fireworks.
5. \$350 the first day of fireworks, pyrotechnics or proximate audience displays conducted in any state-owned building and \$150 per day for each consecutive day for identical multi-day events. If an application is received by the SFMO less than 15 days prior to the planned event, the permit fee shall be \$450 per day and \$150 per day for each consecutive day for identical multi-day events. If an application is received by the SFMO less than 7 days prior to the planned event, the permit fee shall be \$550 per day and \$150 per day for each consecutive day for identical multi-day events.

6. \$250 the first day of fireworks, pyrotechnics or proximate audience displays conducted out-of-doors on any state-owned property and \$150 per day for each consecutive day for identical multi-day events. If an application is received by the SFMO less than 15 days prior to the planned event, the permit fee shall be \$450 per day and \$150 per day for each consecutive day for identical multi-day events. If an application is received by the SFMO less than 7 days prior to the planned event, the permit fee shall be \$550 per day and \$150 per day for each consecutive day for identical multi-day events.

7. \$100 per ~~event~~non-renewable permit, valid for one week from date of issuance, for the use of explosives in special operations or emergency conditions.

8. \$300 the first day for flame effects conducted in accordance with Section 308.3.6 indoors of any state-owned building or outdoors on state-owned property and \$150 per day for each consecutive day for identical multi-day events, or, if conducted as part of a firework (pyrotechnic) display, \$100 the first day and \$75 per day for each consecutive day for identical multi-day events. If an application for flame effects is received by the SFMO less than 15 days prior to the planned event, the permit fee shall be \$450 per day and \$150 per day for each consecutive day for identical multi-day events. If an application is received by the SFMO less than 7 days prior to the planned event, the permit fee shall be \$550 per day and \$150 per day for each consecutive day for identical multi-day events.

Exception: Permits shall not be required for the storage of explosives or blasting agents by the Virginia Department of State Police provided notification to the State Fire Marshal is made annually by the Chief Arson Investigator listing all storage locations within areas where enforcement is provided by the State Fire Marshal's office.

Supporting Statement (including intent, need, and impact of the proposal):

This a SFMO desired consolidation, clean-up and realignment without altering or affecting any technical provisions.

Submittal Information

Date Submitted: 6/3/13 by GAD for SFMO

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 SBCO (State Building Codes Office)
600 East Main Street
Suite 300
Richmond, VA 23219

Email Address: Vernon.hodge@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7150



VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Ed Altizer

Representing: State Fire Marshal's Office

Mailing Address: 1005 Technology Park Drive, Glen Allen, VA 23059

Email Address: ed.altizer@vdfp.virginia.gov

Telephone Number: 804-371-0220

Proposal Information

Code(s) and Section(s): SFPC Section 107.13

Proposed Change (including all relevant section numbers, if multiple sections):

Add sections as follows:

5. \$350 the first day of fireworks, pyrotechnics or proximate audience displays conducted in any state-owned building and \$150 per day for each consecutive day for identical multi-day events. If an application is received by the SFMO less than 15 days prior to the planned event, the permit fee shall be \$450 per day and \$150 per day for each consecutive day for identical multi-day events. If an application is received by the SFMO less than 7 days prior to the planned event, the permit fee shall be \$550 per day and \$150 per day for each consecutive day for identical multi-day events.

5.1 \$100 for the use of permissible fireworks inside any state-owned building.

6. \$250 the first day of fireworks, pyrotechnics or proximate audience displays conducted out-of-doors on any state-owned property and \$150 per day for each consecutive day for identical multi-day events. If an application is received by the SFMO less than 15 days prior to the planned event, the permit fee shall be \$450 per day and \$150 per day for each consecutive day for identical multi-day events. If an application is received by the SFMO less than 7 days prior to the planned event, the permit fee shall be \$550 per day and \$150 per day for each consecutive day for identical multi-day events.

6.1 \$100 for the use of permissible fireworks outdoors on any state-owned property.

Supporting Statement (including intent, need, and impact of the proposal):

In accordance with § 27-96.1 of the Code of Virginia and as restated in SFPC Section 3308.2, permissible fireworks may be used on private property with the permission of the property owner and without having to obtain a permit. State colleges and universities are not private property and do not have the benefit of such exception. There have been a few events or theatrical productions recently in state buildings and on state property where permissible fireworks were to be used. While permits were obtained, the amount of the permit fees and staff time invested using the current fee schedule may not have been in proper proportion for what actually took place. This change is to provide that proportion and more reflective of the SFMO time invested. For the events this change is intended to cover, the interest of the SFMO is more toward looking at the venue itself and to ensure its appropriateness and the overall fire safety of the venue, and not the use of these small items that are less dangerous than those used under permit for aerial (1123) and close proximity

devices (1126).

Basically this provides a reduced fee for permits using permissible fireworks on state property.

Submittal Information

Date Submitted: 6/3/13 by GAD for SFMO

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 SBCO (State Building Codes Office)
600 East Main Street
Suite 300
Richmond, VA 23219

Email Address: Vernon.hodge@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7150



VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Ed Altizer

Representing: State Fire Marshal's Office

Mailing Address: 1005 Technology Park Drive, Glen Allen, VA 23059

Email Address: ed.altizer@vdfp.virginia.gov

Telephone Number: 804-371-0220

Proposal Information

Code(s) and Section(s): SFPC Sections 107.6 and 107.14

Proposed Change (including all relevant section numbers, if multiple sections):

107.6 State Fire Marshal: Permits will not be required by the State Fire Marshal except those permits listed in Section 107.13 and the levy of annual compliance inspection fees listed in Section 107.14 of this code.

Exception: Such permits shall not be required for the storage of explosives or blasting agents by the Virginia Department of State Police provided notification to the State Fire Marshal is made annually by the Chief Arson Investigator listing all storage locations within areas where enforcement is provided by the State Fire Marshal's office.

107.14 State annual compliance inspection permit fees. ~~Annual fees for compliance inspections permits issued~~ performed by the State Fire Marshal's Office ~~for the inspection of buildings~~ shall be as follows:

1. Night clubs

- 1.1. \$350 for occupant load of 100 or less.
- 1.2. \$450 for occupant load of 101 to 200.
- 1.3. \$500 for occupant load of 201 to 300.
- 1.4. \$500 plus \$50 for each 100 occupants where occupant load exceed 300.

2. Private college dormitories with or without assembly areas. If containing assembly areas, such assembly areas are not included in the computation of square footage.

- 2.1. \$150 for 3,500 square feet (325.15 m²) or less.
- 2.2. \$200 for greater than 3,500 square feet (325.15 m²) up to 7,000 square feet (650 m²).
- 2.3. \$250 for greater that 7,000 square feet (650 m²) up to 10,000 square feet (929 m²).
- 2.4. \$250 plus \$50 for each additional 3,000 square feet (278 m²) where square footage exceeds 10,000 (929 m²).

3. Assembly areas that are part of private college dormitories.

- 3.1. \$50 for 10,000 square feet (929 m²) or less provided the assembly area is within or attached to a dormitory building.
- 3.2. \$100 for greater than 10,000 square feet (929 m²) up to 25,000 square feet (2322.5 m²) provided the assembly area is within or attached to a dormitory building, such as gymnasiums, auditoriums or cafeterias.
- 3.3. \$100 for up to 25,000 square feet (2322.5 m²) provided the assembly area is in a separate or separate buildings such as gymnasiums, auditoriums or cafeterias.

3.4. \$150 for greater than 25,000 square feet (2322.5 m²) for assembly areas within or attached to a dormitory building or in a separate or separate buildings such as gymnasiums, auditoriums or cafeterias.

4. Hospitals.

4.1. \$300 for 1 to 50 beds.

4.2. \$400 for 51 to 100 beds.

4.3. \$500 for 101 to 150 beds.

4.4. \$600 for 151 to 200 beds.

4.5. \$600 plus \$100 for each additional 100 beds where the number of beds exceeds 200.

5. ~~Child day centers, assisted living facilities and adult day care centers~~ licensed by the Virginia Department of Social Services based on licensed capacity as follow:

5.1. \$50 for 1 to 8.

5.2. \$75 for 9 to 20.

5.3. \$100 for 21 to 50.

5.4. \$200 for 51 to 100.

5.5. \$400 for 101 or more.

Exception: Annual compliance inspection permits fees for any building or groups of buildings on the same site may not exceed \$2500.

6. Registered complaints.

1st Visit (initial complaint) hourly rate per SFMO staff person - \$0.00

2nd Visit and all subsequent visits hourly rate per SFMO staff person - \$51.00

7. Storage/Retail Display of permissible fireworks.

7.1 Temporary Structures or Stands – 60 day period \$100.00

7.2 Permanent Structure – 60 day period \$190.00

7.3 Permanent Structure – year-round \$240.00

8. Bon Fires (Small & Large) on state owned property.

8.1 For a small bon fire pile with a total fuel area more than 3 feet in diameter and more than 2 feet in height but not more than 9 feet in diameter and not more than 6 feet in height, the permit fee is \$50.00. If an application for a bon fire permit is received by the SFMO less than 15 days prior to the planned event, the permit fee shall be \$100. If an application for bon fire permit is received by the SFMO less than 7 days prior to the planned event, the permit fee shall be \$150.

8.2 For a large bon fire pile with a total fuel area 9 feet or more in height and 6 feet or more in height the permit fee is \$150.00. If an application for a bon fire permit is received by the SFMO less than 15 days prior to the planned event, the permit fee shall be \$300. If an application for bon fire permit is received by the SFMO less than 7 days prior to the planned event, the permit fee shall be \$450.

Supporting Statement (including intent, need, and impact of the proposal):

The change to Section 107.6 is a coordinated change to what is proposed for Section 107.14.

The changes to Section 107.14 is based upon the statutory authority granted in § 27-98 of the Code of Virginia allowing the SFMO charge a fee to recover the actual cost of administering and enforcing the SFPC in jurisdictions for which the office serves as the enforcing authority.

The compliance inspections undertaken for the occupancies listed in Section 107.14, Items 6 and 7 are essentially for the same reasons inspections are performed in the occupancies listed in items 1 through 5; to ensure continued compliance.

Response to complaints results in inspections to ensure all required built-in fire safety features that were required by the USBC at the time of design and construction are properly maintained, including any retrofitting provisions required within the USBC, and that any conditions related to the storage, handling, and use of substances, materials and devices remain in compliance with the provision established in the SFPC.

Whether intentional or not, illegal fireworks are often found at retail outlets, and sometimes *under the counter*. The inspection related to permissible fireworks is a means to ensure illegal fireworks are not mixed into the retail stream and only permissible fireworks are available to the public.

The SFMO has seen an increase in ceremonial bon fires on state property and at some of the state's colleges and universities. The SFMO experience with these bon fires is similar to those of fireworks in terms of the amount of time invested to inspect the site for the appropriateness with greater time and attention given to the larger ones that may involve some level of engineering in the pile's assembly.

Submittal Information

Date Submitted: 6/3/13 by GAD for SFMO

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 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Ed Altizer

Representing: State Fire Marshal's Office

Mailing Address: 1005 Technology Park Drive, Glen Allen, VA 23059

Email Address: ed.altizer@vdfp.virginia.gov

Telephone Number: 804-371-0220

Proposal Information

Code(s) and Section(s): SFPC Section 107.14

Proposed Change (including all relevant section numbers, if multiple sections):

107.14 State ~~annual~~ compliance inspection permit fees. ~~Annual fees for compliance inspections permits-issued performed by the State Fire Marshal's Office for the inspection of buildings~~ shall be as follows:

(Items #1 through 3 and 5 remain unchanged.)

4. Hospitals.

- 4.1. \$300 for 1 to 50 beds.
- 4.2. \$400 for 51 to 100 beds.
- 4.3. \$500 for 101 to 150 beds.
- 4.4. \$600 for 151 to 200 beds.
- 4.5. \$600 plus \$100 for each additional 100 beds where the number of beds exceeds 200.

Exception: ~~Annual fees~~ for any building or groups of buildings on the same site may not exceed \$2500 annually.

6. Boarding House (Transient), Group R3 or R5.

- 6.1 Non-proprietor occupied – 1 to 10 guests \$150.00
- 6.2 Proprietor occupied – 1 to 5 guest rooms \$190.00

7. Hotels/Motels

<u>Number of guest rooms</u>	<u>Fee</u>
<u>1 to 25, single story building</u>	<u>\$100.00</u>
<u>1 to 25, multi-story building</u>	<u>\$190.00</u>
<u>26 to 50, single story building</u>	<u>\$150.00</u>
<u>26 to 50, multi-story building</u>	<u>\$240.00</u>
<u>51 to 100</u>	<u>\$290.00</u>
<u>101 to 150</u>	<u>\$380.00</u>
<u>151 to 200</u>	<u>\$480.00</u>
<u>201 or more</u>	<u>\$570.00</u>

Supporting Statement (including intent, need, and impact of the proposal):

The change to the Exception in Item 4 is solely for the sake of clarity.

The compliance inspections undertaken for the occupancies listed in Items 6 and 7 are essentially for the same reasons inspections are performed in the occupancies listed in the unchanged Items 1, 2, 3 and 5.

Hotels, motels and boarding houses are an important component of the state's tourism industry and the safety of those who temporarily occupy those buildings is just as important to those who occupy health care facilities, day care centers, ALFs, schools, dorms and who seek entertainment within night clubs. The inspections are to ensure all required built-in fire safety features that were required by the USBC at the time of design and construction are properly maintained, including any retrofitting provisions, and that any conditions related to the storage, handling, and use of substances, materials and devices remain in compliance with the provisions established in the SFPC.

Recently, in response to a complaint, the SFMO inspected a motel in Caroline County. The problems found were so extreme and numerous that it was decided that five other adjacent hotels should also be inspected. The problems found included no fire alarm or sprinkler systems inspections and tests records. It was as if the systems had never been touched since installation. Additional problems included damaged fire walls, improper wiring, non-functional emergency lights, and many others.

One of the most serious problem found in all six hotels was, none of the system or room smoke detectors had been tested. In spot testing the detectors, only about 50% functioned at all. Two had fire alarm systems that were out of service. This was readily determined since pull stations were found to have been pulled, but no alarms were sounding.

The inspections altogether involved three inspectors and two managers. One particular motel had not made any progress in obtaining compliance after repeated inspections. Arrest warrants for two owners living outside the area were obtained through the local Commonwealth Attorney's Office and Magistrate's Office. Two additional owners could not be located. Upon the initial inspection, all follow-up inspections and legal actions, the lead inspector alone has spent approximately 20 man-hours for the worst of the 6 hotels, and 65 man-hours on all 6 hotel inspections. Not including the local building official's office, additional hours were invested by the two additional SFMO inspectors and managers.

Proper referral, timeliness of referral, and involvement of the local building official throughout the case involving these 6 hotels was instrumental and invaluable in obtaining compliance.

Another instance this year occurred in an Orange County hotel where numerous fire violations were found including finding propane tanks being stored in a stairwell.

In 2012 in a Nelson County hotel, the fire alarm system was found to be out of service, and the smoke detectors were not working. There were many problems found including, damaged stairs, emergency lights out of service, rooms used for excess storage, and other problems. The owner was summoned to court and through an injunction, was forced to fix the problems found.

Recently, a hotel in Southwest Virginia was found lacking current inspection reports for the sprinkler and fire alarm systems. Fortunately, compliance was gained without any legal action beyond the issuance of a notice of violation.

These recent examples generated through complaints demonstrate the need for pro-active inspections for gaining and maintaining compliance in facilities that are so important to Commonwealth's tourism industry and to the safety of those who occupy the hotels and motels. Past practice has shown that pro-active inspections and the educational opportunities it presents have longer lasting positive effects as opposed to responding to complaints. Past practice and experience has also shown that being proactive in conducting these inspections every year, or even every two years, is, in the end, cheaper for all involved and with a lower time investment by the SFMO. Complaint driven responses produce a larger

time investment for SFMO staff and do not produce the desired long term results of continued compliance and cooperation.

Submittal Information

Date Submitted: 6/3/13 by GAD for SFMO

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 SBCO (State Building Codes Office)
600 East Main Street
Suite 300
Richmond, VA 23219

Email Address: Vernon.hodge@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7150



VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Ed Altizer

Representing: State Fire Marshal's Office

Mailing Address: 1005 Technology Park Drive, Glen Allen, VA 23059

Email Address: ed.altizer@vdfp.virginia.gov

Telephone Number: 804-371-0220

Proposal Information

Code(s) and Section(s): SFPC Sections 107.6, 107.13 and 107.14

Proposed Change (including all relevant section numbers, if multiple sections):

107.13. State explosives, blasting agents, theatrical flame effects and firework permit fees: Except as modified herein. Applications for firework or pyrotechnic displays shall be submitted to and received by the State Fire Marshal's Office not less than 15 days prior to the planned event. Fees for permits issued by the State Fire Marshal's office for the storage, use, sale or manufacture of explosives or blasting agents, and for the display of fireworks and flame effects on state-owned property shall be as follows:

1. ~~\$125~~150 per year per magazine to store explosives and blasting agents.
2. ~~\$200~~250 per year per city or county to use explosives and blasting agents.
3. ~~\$150~~200 per year to sell explosives and blasting agents.
4. ~~\$200~~250 per year to manufacture explosives, blasting agents and fireworks.
5. \$350 the first day of fireworks, pyrotechnics or proximate audience displays conducted in any state-owned building and ~~\$150~~200 per day for each consecutive day for identical multi-day events. If an application is received by the SFMO less than 15 days prior to the planned event, the permit fee shall be ~~\$450~~per 700 the first day and ~~\$150~~400 per day for each consecutive day for identical multi-day events. If an application is received by the SFMO less than 7 days prior to the planned event, the permit fee shall be ~~\$550~~per 1,050 the first day and ~~\$150~~900 per day for each consecutive day for identical multi-day events.
6. \$250 the first day of fireworks, pyrotechnics or proximate audience displays conducted out-of-doors on any state-owned property and ~~\$150~~200 per day for each consecutive day for identical multi-day events. If an application is received by the SFMO less than 15 days prior to the planned event, the permit fee shall be ~~\$450~~per 500 the first day and ~~\$150~~400 per day for each consecutive day for identical multi-day events. If an application is received by the SFMO less than 7 days prior to the planned event, the permit fee shall be ~~\$550~~per 750 the first day and ~~\$150~~600 per day for each consecutive day for identical multi-day events.
7. \$100 per event for the use of explosives in special operations or emergency conditions.
8. \$300 the first day for flame effects conducted in accordance with Section 308.3.6 indoors of any state-owned building or outdoors on state-owned property and ~~\$150~~200 per day for each consecutive day for identical multi-day events, or, if conducted as part of a firework (pyrotechnic) display, ~~\$100~~150 the first day and ~~\$75~~125 per day for each consecutive day for identical multi-day events. If an application for flame effects is received by the SFMO less than 15 days prior to the planned event, the permit fee shall be ~~\$450~~per 550 the first day and ~~\$150~~200 per day for each consecutive day for identical multi-day events or, if conducted as part of a firework (pyrotechnic) display, \$200 the first day and \$100 per day for each consecutive day for identical multi-day events. If an application is

received by the SFMO less than 7 days prior to the planned event, the permit fee shall be ~~\$550 per~~ \$650 the first day and \$150 per day for each consecutive day for identical multi-day events or, if conducted as part of a firework (pyrotechnic) display, \$300 the first day and \$125 per day for each consecutive day for identical multi-day events.

107.14 State annual inspection permit fees. Annual fees for inspection permits issued by the State Fire Marshal's office for the inspection of buildings shall be as follows:

(Items 1 through 4 remain unchanged.)

5. Child day centers, assisted living facilities and adult day care centers licensed by the Virginia Department of Social Services based on licensed capacity as follows:

5.1. \$50 for 1 to 8.

5.2. \$75 for 9 to 20.

5.3. \$100 for 21 to 50.

5.4. \$200 for 51 to 100.

5.5. ~~\$4300 for 101 or more~~ to 150.

5.6. \$400 for 151 to 200.

5.7. \$500 for 201 or more.

Exception: Annual inspection permits for any building or groups of buildings on the same site may not exceed \$2500.

Supporting Statement (including intent, need, and impact of the proposal):

Other than to continue to cover costs associated with administration and enforcement, the increases for Section 107.13, Items 5, 6 and 8 are to strengthen the incentive for submitting applications at least 15 days prior to planned events.

If the questions rises, why the difference in permit fees for outdoor and indoor pyrotechnics, it's because of the greater attention to safety that is demanded of using fireworks indoors and in close proximity to an audience. As a result the need to ensure compliance with the SFPC and referenced standards is heightened which translates to the investment of increased staff time and presence.

Submittal Information

Date Submitted: 6/3/13 by GAD for SFMO

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 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Ed Altizer

Representing: State Fire Marshal's Office

Mailing Address: 1005 Technology Park Drive, Glen Allen, VA 23059

Email Address: ed.altizer@vdfp.virginia.gov

Telephone Number: 804-371-0220

Proposal Information

Code(s) and Section(s): SFPC Section 107.16.1

Proposed Change (including all relevant section numbers, if multiple sections):

Add new section 107.16.1 to read:

107.16.1 SFMO certification and permit fees not refundable. No refund of any part of the amount paid as a permit or certification fee will be made where the applicant, permit or certification holder, for any reason, discontinued an activity, changed conditions, or changed circumstances for which the permit or certification was issued. However, the permit or certification fee submitted with an application will be refunded if the permit or certification is cancelled, revoked or suspended subsequent to having been issued through administrative error, or if a permit being applied for is to be obtained from a locally appointed fire official.

Supporting Statement (including intent, need, and impact of the proposal):

The supporting position of this change should be self-evident; the SFMO and agency have invested time and effort to process applications for permit or certifications and that effort should remain properly funded. By the same token, if the SFMO and agency have committed an administrative error that is not the fault of the applicant, or an application were mistakenly submitted to the SFMO when instead, a local fire official is the proper issuing authority; the means is provided to process a refund.

Submittal Information

Date Submitted: 6/3/13 by GAD for SFMO

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 SBCO (State Building Codes Office)
600 East Main Street
Suite 300
Richmond, VA 23219

Email Address: Vernon.hodge@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7150



VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Ed Altizer

Representing: State Fire Marshal's Office

Mailing Address: 1005 Technology Park Drive, Glen Allen, VA 23059

Email Address: ed.altizer@vdfp.virginia.gov

Telephone Number: 804-371-0220

Proposal Information

Code(s) and Section(s): New SFPC Section 5601.4.3.1

Proposed Change (including all relevant section numbers, if multiple sections):
Add new Section 5601.4.3.1 to read:

5601.4.3.1 Fee for replacement certificate. A written request for a replacement blaster or pyrotechnician certificate shall be accompanied the payment of an administrative fee in the amount of twenty dollars (\$20.00) made payable to the Treasurer of Virginia. Verbal requests shall not be accepted.

Supporting Statement (including intent, need, and impact of the proposal):

If a certificate has been lost, destroyed or rendered illegible, there is an associated cost for staff to receive a request and issue a replacement certificate. This fee is to cover the staff/administrative cost.

Submittal Information

Date Submitted: 6/3/13 by GAD for SFMO

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 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Robby Dawson

Representing: Fire Services Board Code Committee

Mailing Address: 1005 Technology Park Drive, Glen Allen, VA 23059

Email Address: dawsonj@chesterfield.gov

Telephone Number: 804-748-1426

Proposal Information

Code(s) and Section(s): SFPC Section 108.3

Proposed Change (including all relevant section numbers, if multiple sections):

108.3 Conditions of a permit. An operational permit shall constitute permission to maintain, store or handle materials; or to conduct processes in accordance with the SFPC, and shall not be construed as authority to omit or amend any of the provisions of this code. ~~The building official shall issue permits to install equipment utilized in connection with such activities; or to install or modify any fire protection system or equipment or any other construction, equipment installation or modification in accordance with the provisions of this code where a permit is required by Section 108.5. Such permission shall not be construed as authority to omit or amend any of the provisions of this code.~~

Note: The building official shall issue permits to install equipment utilized in connection with such activities; or to install or modify any fire protection system or equipment or any other construction, equipment installation or modification in accordance with the provisions of this code where a permit is required by Section 108.5. Such permission shall not be construed as authority to omit or amend any of the provisions of this code.

Supporting Statement (including intent, need, and impact of the proposal):

The language and authority on who issues a permit to install or modify fire protection systems, equipment, and other building components already resides in the USBC and is clearly stated in SFPC Section 102.6 which renders the language proposed for deletion as repetitive. At best, if it were to be retained in the SFPC, it would be more appropriate for this language to be in the form of an informational note to whoever uses the SFPC.

In addition, the 2nd sentence does not relate to the 1st sentence when asking the question, what is meant by "such activities"? Not does it make sense within the 2nd sentence itself. It appears the sentence is incomplete.

Submittal Information

Date Submitted: June 3, 2013

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 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Robby Dawson

Representing: Fire Services Board Code Committee

Mailing Address: _____

Email Address: dawsonj@chesterfield.gov

Telephone Number: 804-717-6838

Proposal Information

Code(s) and Section(s): SFPC Section 202 and 308.1.6.3

Proposed Change (including all relevant section numbers, if multiple sections):

Add the following definition to Section 202 to read:

SKY LANTERN. An unmanned device with a fuel source that incorporates an open flame in order to make the device airborne.

Add new Section 308.1.6.3 to read:

308.1.6.3 Sky lanterns. No person shall release or cause to be released an untethered sky lantern.

Supporting Statement (including intent, need, and impact of the proposal):

This change is to provide specificity based on a TRB interpretation issued two years ago. This change also was approved at the Dallas, TX Code Committee hearings with a minor modification included here on a vote of 14-0.

Sky lanterns contain an open flame used to heat the air inside the device to make it airborne. Once airborne, these devices are subject to winds and other atmospheric conditions so that the location of the landfall is completely unknown and uncontrolled by the user. Obviously, uncontrolled open flame devices descending out of the sky have the significant potential to start wildfires and structural fires.

Submittal Information

Date Submitted: June 3, 2013

The proposal may be submitted by email as an attachment, by fax, by mail, or by hand delivery.

Please submit the proposal to:

Code Change - F308.1.6.3, FSBCC.doc

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: DHCD Placeholder _____

Representing: _____

Mailing Address: _____

Email Address: _____

Telephone Number: _____

Proposal Information

Code(s) and Section(s): SFPC IFC 403.3 _____

Proposed Change (including all relevant section numbers, if multiple sections):

Crowd Managers – 250 persons for each crowd manager beyond 1,000 or 2 crowd managers for each 500 persons up to 1,000 and then 250 persons.

Note: What about churches?

Supporting Statement (including intent, need, and impact of the proposal):

Some interpret no crowd managers up to 1,000 but if there are 1,001 or more, then 5 or more are needed.
See F23-13 code change (2015 IFC)

Submittal Information

Date Submitted: 6/25/13 _____

The proposal may be submitted by email as an attachment, by fax, by mail, or by hand delivery.

Please submit the proposal to:

DHCD DEBAR State Building Codes Office
600 East Main Street,
Suite 300
Richmond, VA 23219

Email Address: vernon.hodge@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7150



VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Robby Dawson

Representing: Fire Services Board Code Committee

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): SFPC Section 403.3.1 and 403.2

Proposed Change (including all relevant section numbers, if multiple sections):

403.3.1 Training. Training for crowd managers shall be approved.

403.2 Duties. The duties of crowd managers shall include, but not be limited to:

1. Conduct an inspection of the area of responsibility and identify and address any egress barriers.
2. Conduct an inspection of the area of responsibility to identify and mitigate any fire hazards.
3. Verify compliance with all permit conditions, including those governing pyrotechnics and other special effects.
4. Direct and assist the event attendees in evacuation during an emergency.
5. Assist emergency response personnel where requested.
6. Other duties required by the fire code official.
7. Other duties as specified in the fire safety plan.

Supporting Statement (including intent, need, and impact of the proposal):

The code requires "trained crowd managers", but doesn't provide any guidance or describe what that training should include. The basic training outlined by this new provision gives guidance to the public and users of the SFPC with what type of basic training is required to ensure the safety of the patrons in the areas where these managers are required.

This does not require any additional staffing in these venues, only that the staff that are there are able to identify and respond to hazards and risks associated with large gatherings.

This has been an ongoing issue for enforcement personnel and businesses as well. This change is intended to address that void. This is the same change heard at the ICC CAH recently held in Dallas and was approved as submitted on a 13-1 vote.

Submittal Information

Code Change - F403.3.1, FSBCC.docx

Date Submitted: 6/3/2013

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 SBCO (State Building Codes Office)
600 East Main Street
Suite 300
Richmond, VA 23219

Email Address: Vernon.hodge@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7150



VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual X Government Entity Company

Name: Ed Altizer

Representing: State Fire Marshal's Office

Mailing Address: 1005 Technology Park Drive, Glen Allen, VA 23059

Email Address: ed.altizer@vdfp.virginia.gov

Telephone Number: 804-371-0220

Proposal Information

Code(s) and Section(s): SFPC Section 307.1

Proposed Change (including all relevant section numbers, if multiple sections):

307.1 General. A person shall not kindle or maintain or authorize to be kindled or maintained any *open burning* unless conducted and *approved* in accordance with Sections 307.1.1 through 307.5.

Exception: Approved outdoor live fire training using equipment or appliances accessible or available to the general public, and complies with Section 307.4.

Supporting Statement (including intent, need, and cost impact of the proposal):

If a building's owner or occupant wishes to train building occupants or other personnel in the use of hose systems, portable fire extinguishers, or any other appliance used to suppress or extinguish incipient fires, this exception will exclude the use of live fire from being labeled as "open burning" and any provisions that would inhibit or restrict such training.

Submittal Information

Date Submitted: 6/21/13 by GAD for SFMO

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 SBCO (State Building Codes Office)
600 East Main Street
Suite 300
Richmond, VA 23219

Email Address: Vernon.hodge@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7150



VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Robby Dawson

Representing: Fire Services Board Code Committee

Mailing Address: _____

Email Address: dawsonj@chesterfield.gov

Telephone Number: 804-717-6838

Proposal Information

Code(s) and Section(s): SFPC Chapter 4 revision

Proposed Change (including all relevant section numbers, if multiple sections):

Revise Section 403 as follows (includes text relocated from Sections 404.2 and 408 and now merged into Section 403):

SECTION 403408

USE AND OCCUPANCY-RELATED EMERGENCY PREPAREDNESS REQUIREMENTS

403.1408.1 General. In addition to the requirements of Section 401, occupancies, uses and outdoor locations shall comply with the emergency preparedness requirements set forth in Sections 403.2 through 403.11. Where a fire safety and evacuation plan is required by Sections 403.2 through 403.11, evacuation drills shall be in accordance with Section 405 and employee training shall be in accordance with Section 406. In addition to the other requirements of this chapter, the provisions of this section are applicable to specific occupancies listed herein.

403.2408.2 Group A occupancies. An approved fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for Group A occupancies, other than those occupancies used exclusively for purposes of religious worship with an occupant load less than 2,000, and for buildings containing both a Group A occupancy and an atrium. Group A occupancies shall also comply with the requirements of Sections 403.2.1 through 403.2.4408.2.1 and 408.2.2 and Sections 401 through 406.

403.2.1408.2.1 Seating plan. In addition to the requirements of Section 404.2, the fire safety and evacuation plans for assembly occupancies shall include the information required by Section 404.3 and a detailed seating plan, occupant load and occupant load limit. Deviations from the approved plans shall be allowed provided the occupant load limit for the occupancy is not exceeded and the aisles and exit accessways remain unobstructed.

403.2.2408.2.2 Announcements. In theaters, motion picture theaters, auditoriums and similar assembly occupancies in Group A used for noncontinuous programs, an audible announcement shall be made not more than 10 minutes prior to the start of each program to notify the occupants of the location of the exits to be used in the event of a fire or other emergency.

Exception: In motion picture theaters, the announcement is allowed to be projected upon the screen in a manner *approved* by the *fire code official*.

403.2.2.1 Night clubs. Night clubs shall comply with Sections 408.2.2.1.1 and 408.2.2.1.2.

408.2.2.1.1 Audible announcements. Audible announcements shall be made to the occupants no longer than 10 minutes prior to the start of the entertainment and at each intermission to notify the occupants of the location of the exits to be used in the event of a fire or other emergency.

408.2.2.1.2. Occupant load count. Upon request of the fire code official, the owner or operator, or both, will be required to keep a running count of the occupant load to provide to the fire code official during performance hours of operation, entertainment hours of operation, or both.

403.2.3 Fire watch personnel. Fire watch personnel shall be provided where required by Section 403.11.1.

403.2.4 Crowd managers. Crowd managers shall be provided where required by Section 403.11.3.

403.3 Group B occupancies. An approved fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for buildings containing a Group B occupancy where the Group B occupancy has an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge .

403.4 Group E occupancies. An approved fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for Group E occupancies and for buildings containing both a Group E occupancy and an atrium. Group E occupancies shall also comply with Section 403.4.1

403.4.1-408.3 Group E occupancies and Group R-2 college and university buildings. Group E occupancies shall comply with the requirements of Sections 403.4.1.1 through 403.4.1.3 408.3.1 through 408.3.4 and Sections 401 through 406. Group R-2 college and university buildings shall comply with the requirements of Sections 408.3.1 and 408.3.3 and Sections 401 through 406.

403.4.1.1 408.3.4 First emergency evacuation drill. The first emergency evacuation drill of each school year shall be conducted within 10 days of the beginning of classes.

408.3.2 Emergency evacuation drill deferral. ~~In severe climates, the fire code official shall have the authority to modify the emergency evacuation drill frequency specified in Section 405.2.~~

403.4.1.2 408.3.3 Time of day. Emergency evacuation drills shall be conducted at different hours of the day or evening, during the changing of classes, when the school is at assembly, during the recess or gymnastic periods, or during other times to avoid distinction between drills and actual fires. ~~In Group R-2 college and university buildings, one required drill shall be held during hours after sunset or before sunrise.~~

403.4.1.3 408.3.4 Assembly points. Outdoor assembly areas shall be designated and shall be located a safe distance from the building being evacuated so as to avoid interference with fire department operations. The assembly areas shall be arranged to keep each class separate to provide accountability of all individuals.

403.5 Group F occupancies. An approved fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for buildings containing a Group F occupancy where the Group F occupancy has an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge .

403.6 Group H Occupancies. An approved fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for Group H occupancies. Group H-5 occupancies shall also comply with Section 403.6.1.

403.6.1408.4 Group H-5 occupancies. Group H-5 occupancies shall comply with the requirements of Sections 403.6.1.1 through 403.6.1.4408.4.1 through 408.4.4 and Sections 401 through 407.

403.6.1.1408.4.1 Plans and diagrams. In addition to the requirements of Section 404 and Section 407.6, plans and diagrams shall be maintained in *approved* locations indicating the approximate plan for each area, the amount and type of HPM stored, handled and used, locations of shutoff valves for HPM supply piping, emergency telephone locations and locations of exits.

403.6.1.2408.4.2 Plan updating. The plans and diagrams required by Section 404, 403.6.1.1 and 407.6408.4.1 shall be maintained up to date and the *fire code official* and fire department shall be informed of all major changes.

403.6.1.3408.4.3 Emergency response team. Responsible persons shall be designated ~~the~~ as an on-site emergency response team and trained to be liaison personnel for the fire department. These persons shall aid the fire department in preplanning emergency responses, identifying locations where HPM is stored, handled and used, and be familiar with the chemical nature of such material. An adequate number of personnel for each work shift shall be designated.

403.6.1.4408.4.4 Emergency drills. Emergency drills of the on-site emergency response team shall be conducted on a regular basis but not less than once every three months. Records of drills conducted shall be maintained.

403.7 Group I occupancies. An approved fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for Group I occupancies. Group I occupancies shall also comply with Sections 403.7.1 through 403.7.3

403.7.1408.5 Group I-1 occupancies. Group I-1 occupancies shall comply with the requirements of Sections 403.7.1.1 through 403.7.1.6408.5.1 through 408.5.5 and Sections 401 through 406.

403.7.1.1408.5.4 Fire safety and evacuation plan. The fire safety and evacuation plan required by Section 404 shall include special ~~staff~~ employee actions, including fire protection procedures necessary for residents, and shall be amended or revised upon admission of any resident with unusual needs.

403.7.1.2408.5.2 Staff-Employee training. Employees shall be periodically instructed and kept informed of their duties and responsibilities under the plan. Such instruction shall be reviewed by the ~~staff employees~~ at intervals not exceeding least every two months. A copy of the plan shall be readily available at all times within the facility.

403.7.1.3408.5.3 Resident training. Residents capable of assisting in their own evacuation shall be trained in the proper actions to take in the event of a fire. The training shall include actions to take if the primary escape route is blocked. Where the resident is given rehabilitation or habilitation training, training in fire prevention and actions to take in the event of a fire shall be a part of the rehabilitation training program. Residents shall be trained to assist each other in case of fire to the extent their physical and mental abilities permit them to do so without additional personal risk.

403.7.1.4408.5.4 Drill frequency. Emergency evacuation drills shall be conducted at least six times per year, two times per year on each shift. Twelve drills shall be conducted in the first year of operation.

403.7.1.5 Drill times. ~~Drills times are not required to comply with the time requirements of Section 405.4.~~

403.7.1.6~~408.5.5~~ **Resident participation in drills.** Emergency evacuation drills shall involve the actual evacuation of residents to a selected assembly point.

403.7.2~~408.6~~ **Group I-2 occupancies.** Group I-2 occupancies shall comply with ~~the requirements of Sections 403.7.2.1 through 403.7.2.3~~408.6.1 and 408.6.2 and Sections 401 through 406.

403.7.2.1 Drill times. ~~Drills times are not required to comply with the time requirements of Section 405.4.~~

403.7.2.2~~408.6.1~~ **Evacuation not required.** During emergency evacuation drills, the movement of patients to safe areas or to the exterior of the building is not required.

403.7.2.3~~408.6.2~~ **Coded alarm signal.** When emergency evacuation drills are conducted after visiting hours or when patients or residents are expected to be asleep, a coded announcement is allowed instead of audible alarms.

403.7.3~~408.7~~ **Group I-3 occupancies.** Group I-3 occupancies shall comply with ~~the requirements of Sections 403.7.3.1 through 403.7.3.4~~408.7.1 through 408.7.4 and Sections 401 through 406.

403.7.3.1~~408.7.1~~ **Employee training.** Employees shall be instructed in the proper use of portable fire extinguishers and other manual fire suppression equipment. Training of new ~~staff~~ employees shall be provided promptly upon entrance on duty. Refresher training shall be provided at least annually.

403.7.3.2~~408.7.2~~ **Employee sStaffing.** Group I-3 occupancies shall be provided with 24-hour staffing. ~~Staff~~ An employee shall be within three floors or 300 feet (91 440 mm) horizontal distance of the access door of each resident housing area. In Use-Conditions 3, 4 and 5, as defined in "Occupancy Classification – Institutional Group I-3" in Chapter 2, the arrangement shall be such that the ~~staff~~ employee involved can start release of locks necessary for emergency evacuation or rescue and initiate other necessary emergency actions within 2 minutes of an alarm.

Exception: An employee ~~Staff~~ shall not be required to be within three floors or 300 feet (9144 mm) in areas in which all locks are unlocked remotely and automatically in accordance with Section 408.4 of the *International Building Code*.

403.7.3.3~~408.7.3~~ **Notification.** Provisions shall be made for residents in Use-Conditions 3, 4 and 5, as defined in "Occupancy Classification – Institutional Group I-3" in Chapter 2, to readily notify an employee ~~staff~~ of an emergency.

403.7.3.4~~408.7.4~~ **Keys.** Keys necessary for unlocking doors installed in a *means of egress* shall be individually identifiable by both touch and sight.

403.8 Group M occupancies. An approved fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for buildings containing a Group M occupancy, where the Group M occupancy has an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge, and for buildings containing both a Group M occupancy and an atrium.

403.9 Group R occupancies.

403.9.1~~408.8~~ **Group R-1 occupancies.** An approved fire safety and evacuation plan in accordance with Section

404 shall be prepared and maintained for Group R-1 occupancies. Group R-1 occupancies shall also comply with the requirements of Sections 403.9.1.1 through 403.9.1.3, 408.8.1 through 408.8.3 and Sections 404 through 406.

403.9.1.1408.8.1 Evacuation diagrams. A diagram depicting two evacuation routes shall be posted on or immediately adjacent to every required egress door from each hotel or motel sleeping unit.

403.9.1.2408.8.2 Emergency duties. Upon discovery of a fire or suspected fire, hotel and motel employees shall perform the following duties:

1. Activate the fire alarm system, where provided.
2. Notify the public fire department.
3. Take other action as previously instructed.

403.9.1.3408.8.3 Fire safety and evacuation instructions. Information shall be provided in the fire safety and evacuation plan required by Section 404 to allow guests to decide whether to evacuate to the outside, evacuate to an *area of refuge*, remain in place, or any combination of the three.

403.9.2408.9 Group R-2 occupancies. Group R-2 occupancies shall comply with the requirements of Sections 403.9.2.1 through 403.9.2.3, 408.9.1 through 408.9.4 and Sections 404 through 406.

403.9.2.1. College and University Buildings. An approved fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for Group R-2 college and university buildings. Group R-2 college and university buildings shall also comply with Sections 403.9.2.1 and 403.9.2.2.

403.9.2.1.1 First emergency evacuation drill. The first emergency evacuation drill of each school year shall be conducted within 10 days of the beginning of classes.

403.9.2.1.2 Time of day. Emergency evacuation drills shall be conducted at different hours of the day or evening, during the changing of classes, when the school is at assembly, during the recess or gymnastic periods, or during other times to avoid distinction between drills and actual fires. One required drill shall be held during hours after sunset or before sunrise.

403.9.2.2408.9.1 Emergency guide. Fire emergency guides shall be provided for Group R-2 occupancies. Guide contents, maintenance and distribution shall comply with Sections 403.9.2.2.1 through 403.9.2.2.3

403.9.2.2.1 Guide contents. A fire emergency guides shall be provided which describes the location, function and use of fire protection equipment and appliances accessible to residents, including fire alarm systems, smoke alarms, and portable fire extinguishers. The guides shall also include an emergency evacuation plan for each dwelling unit.

403.9.2.2.2408.9.3 Emergency guide mMaintenance. Emergency guides shall be reviewed and approved by the fire code official in accordance with Section 404.2. Evacuation diagrams shall be reviewed and updated in accordance with Section 404.4.

403.9.2.2.3408.9.4 Emergency guide dDistribution. A copy of the emergency guide shall be given to each tenant prior to initial occupancy.

403.9.2.3 Evacuation diagrams for dormitories. A diagram depicting two evacuation routes shall be posted on or immediately adjacent to every required egress door from each dormitory sleeping unit.

Evacuation diagrams shall be reviewed and updated as needed to maintain accuracy.

403.9.3.408.10 Group R-4 occupancies. An approved fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for Group R-4 occupancies. Group R-4 occupancies shall also comply with the requirements of Sections 403.9.3.1 through 403.9.3.6-408.10.1 through 408.10.5 and Sections 401 through 406.

403.9.3.1408.10.4 Fire safety and evacuation plan. The fire safety and evacuation plan required by Section 404 shall include special ~~staff~~employee actions, including fire protection procedures necessary for residents, and shall be amended or revised upon admission of a resident with unusual needs.

403.9.3.2408.10.2 Staff Employee training. Employees shall be periodically instructed and kept informed of their duties and responsibilities under the plan. Such instruction shall be reviewed by employees at intervals not exceeding ~~the staff at least every~~ two months. A copy of the plan shall be readily available at all times within the facility.

403.9.3.3408.10.3 Resident training. Residents capable of assisting in their own evacuation shall be trained in the proper actions to take in the event of a fire. The training shall include actions to take if the primary escape route is blocked. Where the resident is given rehabilitation or habilitation training, training in fire prevention and actions to take in the event of a fire shall be a part of the rehabilitation training program. Residents shall be trained to assist each other in case of fire to the extent their physical and mental abilities permit them to do so without additional personal risk.

403.9.3.4408.10.4 Drill frequency. Emergency evacuation drills shall be conducted at least six times per year, two times per year on each shift. Twelve drills shall be conducted in the first year of operation.

403.9.3.5 Drill times. Drills times are not required to comply with ~~the time requirements of~~ Section 405.4.

403.9.3.6408.10.5 Resident participation in drills. Emergency evacuation drills shall involve the actual evacuation of residents to a selected assembly point and shall provide residents with experience in exiting through all required exits. All required exits shall be used during emergency evacuation drills.

Exception: Actual exiting from windows shall not be required. Opening the window and signaling for help shall be an acceptable alternative.

403.10 Special uses.

403.10.1408.11 Covered and open mall buildings. Covered and open mall buildings shall comply with the ~~provisions~~requirements of Sections 403.10.1.1 through 403.10.1.6~~408.11.1 through 408.11.3.~~

403.10.1.1 Malls and mall buildings exceeding 50,000 square feet. An approved fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for covered malls exceeding 50,000 square feet (4645 m²) in aggregate floor area and for open mall buildings exceeding 50,000 square feet (4645 m²) in aggregate area within perimeter line.

403.10.1.2408.11.1 Lease plan. In addition to the requirements of Section 404.2.2, a lease plan that includes the following information shall be prepared for each covered and open mall building: ~~The plan shall include the following information in addition to that required by Section 404.3.2:~~

1. Each occupancy, including identification of tenant.
2. Exits from each tenant space.

3. Fire protection features, including the following:
 - 3.1. Fire department connections.
 - 3.2. *Fire command center.*
 - 3.3. Smoke management system controls.
 - 3.4. Elevators, elevator machine rooms and controls.
 - 3.5. Hose valve outlets.
 - 3.6. Sprinkler and standpipe control valves.
 - 3.7. Automatic fire-extinguishing system areas.
 - 3.8. Automatic fire detector zones.
 - 3.9. *Fire barriers.*

403.10.1.3~~408.11.1.1~~ **Lease plan approval.** The lease plan shall be submitted to the *fire code official* for approval, and shall be maintained on site for immediate reference by responding fire service personnel.

403.10.1.4~~408.11.1.2~~ **Lease plan revisions.** The lease plans shall be revised annually or as often as necessary to keep them current. Modifications or changes in tenants or occupancies shall not be made without prior approval of the *fire code official* and building official.

403.10.1.5~~408.11.2~~ **Tenant identification.** Tenant identification shall be provided for secondary exits from occupied tenant spaces that lead to an *exit corridor* or directly to the exterior of the building. Each occupied tenant space provided with a secondary exit to the exterior or *exit corridor* shall be provided with tenant identification by Tenant identification shall be posted on the exterior side of the exit or exit access door and shall identify the business name and/or address. Letters and numbers shall be posted on the *corridor* side of the door, be using plainly legible letters and numbers that and shall contrast with their background.

Exception: Tenant identification is not required for anchor stores.

403.10.1.6 **Unoccupied tenant spaces.** The fire safety and evacuation plan shall provide for compliance with the requirements for unoccupied tenant spaces in Section 311.

408.11.3 **Maintenance.** Unoccupied tenant spaces shall be:

- ~~1. Kept free from the storage of any materials.~~
- ~~2. Separated from the remainder of the building by partitions of at least 0.5-inch thick (12.7 mm) gypsum board or an approved equivalent to the underside of the ceiling of the adjoining tenant spaces.~~
- ~~3. Without doors or other access openings other than one door that shall be kept key locked in the closed position except during that time when opened for inspection.~~
- ~~4. Kept free from combustible waste and be broomswept clean.~~

403.10.2 **High-rise buildings.** An *approved* fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for high-rise buildings.

403.10.3 **Underground buildings.** An *approved* fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for underground buildings.

403.10.4 **SCRF.** An *approved* fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for SRCFs.

403.11 **Special requirements for public safety.**

SECTION 403 PUBLIC ASSEMBLAGES AND EVENTS

403.11.1403.1 Fire watch personnel. When, in the opinion of the *fire code official*, it is essential for public safety in a place of assembly or any other place where people congregate, because of the number of persons, or the nature of the performance, exhibition, display, contest or activity, the *owner*, agent or lessee shall provide one or more fire watch personnel, as required and *approved*. Fire watch personnel shall comply with Sections 403.11.1.1 and 403.11.1.2. to remain on duty during the times such places are open to the public, or when such activity is being conducted.

403.1.1 Duties. ~~Fire watch personnel shall keep diligent watch for fires, obstructions to *means of egress* and other hazards during the time such place is open to the public or such activity is being conducted and take prompt measures for remediation of hazards, extinguishment of fires that occur and assist in the evacuation of the public from the structures.~~

403.11.1.1 Duty Times. Fire watch personnel shall remain on duty during the times places requiring a fire watch are open to the public, or when an activity requiring a fire watch is being conducted.

403.11.1.2 Duties. On-duty fire watch personnel shall have the following duties:

1. Keep diligent watch for fires, obstructions to *means of egress* and other hazards
2. Take prompt measures for remediation of hazards and extinguishment of fires that occur
3. Take prompt measures to assist in the evacuation of the public from the structures.

403.11.2403.2 Public safety plan for gatherings. In other than Group A or E occupancies, where the *fire code official* determines that an indoor or outdoor gathering of persons has an adverse impact on public safety through diminished access to buildings, structures, fire hydrants and fire apparatus access roads or where such gatherings adversely affect public safety services of any kind, the *fire code official* shall have the authority to order the development of or prescribe a public safety plan that provides an approved level of public safety and addresses the following items; ~~or prescribe a plan for, the provision of an *approved* level of public safety.~~

403.2.1 Contents. ~~The public safety plan, where required by Section 403.2, shall address such items~~

1. ~~as e~~Emergency vehicle ingress and egress
2. ~~F~~fire protection
3. ~~e~~Emergency egress or escape routes
4. ~~e~~Emergency medical services
5. ~~p~~Public assembly areas
6. ~~and {~~The directing of both attendees and vehicles, ~~}~~ (including the parking of vehicles)
7. ~~v~~Vendor and food concession distribution
8. ~~and {~~The need for the presence of law enforcement
9. ~~and~~ The need for fire and emergency medical services personnel at the event.

403.11.3403.3 Crowd managers for gatherings exceeding 1,000 people. ~~Trained crowd managers shall be provided for. Where facilities or events involve a gathering of where more than 1,000 people, crowd managers shall be provided in accordance with Section 403.11.3.1. persons congregate. The minimum number of crowd managers shall be established at a ratio of one crowd manager to every 250 persons. Where *approved* by the *fire code official*, the ratio of crowd managers shall be permitted to be reduced where the facility is equipped throughout with an *approved automatic sprinkler system* or based upon the nature of the event.~~

403.11.3.1 Number of crowd managers. The minimum number of crowd managers shall be established at a ratio of one crowd manager for ~~to~~ every 250 persons.

Exception: Where *approved* by the *fire code official*, the ratio number of crowd managers shall

be permitted to be reduced where the facility is equipped throughout with an *approved automatic sprinkler system* or based upon the nature of the event.

Revise Section 404 as follows:

SECTION 404 FIRE SAFETY, AND EVACUATION AND LOCKDOWN PLANS

404.1 General. ~~Where required by Section 403,~~ Fire safety, evacuation and lockdown plans ~~and associated drills shall comply with the requirements of Sections 404.2 through 404.4.1404.5.1.~~

(existing Section 404.2 is relocated and merged into Section 403 with the remaining sections renumbered)

404.2 Where required. ~~An approved fire safety and evacuation plan shall be prepared and maintained for the following occupancies and buildings.~~

- ~~1. Group A, other than Group A occupancies used exclusively for purposes of religious worship that have an occupant load less than 2,000.~~
- ~~2. Group B buildings having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge.~~
- ~~3. Group E.~~
- ~~4. Group F buildings having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge.~~
- ~~5. Group H.~~
- ~~6. Group I.~~
- ~~7. Group R-1.~~
- ~~8. Group R-2 college and university buildings.~~
- ~~9. Group R-4.~~
- ~~10. High-rise buildings.~~
- ~~11. Group M buildings having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge.~~
- ~~12. Covered malls exceeding 50,000 square feet (4645 m²) in aggregate floor area.~~
- ~~13. Open mall buildings exceeding 50,000 square feet (4645 m²) in aggregate area within perimeter line.~~
- ~~14. Underground buildings.~~
- ~~15. Buildings with an atrium and having an occupancy in Group A, E or M.~~
- ~~16. SRCF.3~~

Revise Section 405 as follows:

SECTION 405 EMERGENCY EVACUATION DRILLS

405.1 General. ~~Emergency evacuation drills complying with the provisions of this section.~~ Sections 405.2 through 405.9 shall be conducted at least annually in the occupancies listed in Section 404.2 where fire safety and evacuation plans are required by Section 403 or when required by the fire code official. Drills shall be designed in cooperation with the local authorities.

Exception: Emergency evacuation drills shall not be conducted in school buildings during periods of mandatory testing required by the Virginia Board of Education.

405.2 Frequency. Required emergency evacuation drills shall be held at the intervals specified in Table 405.2 or more frequently where necessary to familiarize all occupants with the drill procedure.

405.2.1 High-rise buildings. Fire exit drills shall be conducted annually by building staff personnel or the owner of the building in accordance with the fire safety plan and shall not affect other current occupants.

405.3 Leadership. Responsibility for the planning and conduct of drills shall be assigned to competent persons designated to exercise leadership.

405.4 Time. Drills shall be held at unexpected times and under varying conditions to simulate the unusual conditions that occur in case of fire.

405.5 Record keeping. Records shall be maintained of required emergency evacuation drills and include the following information:

1. Identity of the person conducting the drill.
2. Date and time of the drill.
3. Notification method used.
4. ~~Staff members~~ Employees on duty and participating.
5. Number of occupants evacuated.
6. Special conditions simulated.
7. Problems encountered.
8. Weather conditions when occupants were evacuated.
9. Time required to accomplish complete evacuation.

**TABLE 405.2
FIRE AND EVACUATION DRILL
FREQUENCY AND PARTICIPATION**

Group or Occupancy	Frequency	Participation
Group A	Quarterly	Employees
Group B ^c	Annually	Employees
Group E	Monthly ^z	All occupants
Group F	Annually	Employees
Group I	Quarterly on each shift	Employees ^b
Group R-1	Quarterly on each shift	Employees
Group R-2 ^d	Four annually	All occupants
Group R-4	Quarterly on each shift	Employees ^b
High-rise buildings	Annually	Employees
SRCF	Monthly	All occupants

a. In severe climates, the fire code official shall have the authority to modify the emergency evacuation drill frequency. ~~The frequency shall be allowed to be modified in accordance with Section 408.3.2.~~

b. Fire and evacuation drills in residential care assisted living facilities shall include complete evacuation of the premises in accordance with Section 403.9.3.6408.10.5. Where occupants receive habilitation or rehabilitation training, fire prevention and fire safety practices shall be included as part of the training program.

c. Group B buildings having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge.

d. Applicable to Group R-2 college and university buildings in accordance with Section 403.9.2.1408.3.

405.6 Notification. Where required by the *fire code official*, prior notification of emergency evacuation drills shall be given to the *fire code official*.

405.7 Initiation. Where a fire alarm system is provided, emergency evacuation drills shall be initiated by activating the fire alarm system.

405.8 Accountability. As building occupants arrive at the assembly point, efforts shall be made to determine if all occupants have been successfully evacuated or have been accounted for.

405.9 Recall and reentry. An electrically or mechanically operated signal used to recall occupants after an evacuation shall be separate and distinct from the signal used to initiate the evacuation. The recall signal initiation means shall be manually operated and under the control of the person in charge of the premises or the official in charge of the incident. No one shall reenter the premises until authorized to do so by the official in charge.

Revise Section 406 as follows:

406.1 General. ~~Where fire safety and evacuation plans are required by Section 403, Employees in the occupancies listed in Section 404.2 shall be trained in the fire emergency procedures described in their fire evacuation and fire safety plans. Training shall be based on plans prepared in accordance with Section 404, these plans and as described in Section 404.3.~~

406.2 Frequency. Employees shall receive training in the contents of fire safety and evacuation plans and their duties as part of new employee orientation and at least annually thereafter. Records shall be kept and made available to the *fire code official* upon request.

406.3 Employee training program. Employees shall be trained in fire prevention, evacuation and fire safety in accordance with Sections 406.3.1 through 406.3.4.

406.3.1 Fire prevention training. Employees shall be apprised of the fire hazards of the materials and processes to which they are exposed. Each employee shall be instructed in the proper procedures for preventing fires in the conduct of their assigned duties.

406.3.2 Evacuation training. Employees shall be familiarized with the fire alarm and evacuation signals, their assigned duties in the event of an alarm or emergency, evacuation routes, areas of refuge, exterior assembly areas and procedures for evacuation.

~~**406.3.3 Emergency lockdown training.** Where a facility has a lockdown plan, employees shall be trained on their assigned duties and procedures in the event of an emergency lockdown. (moved to Section 406.4)~~

406.3.34 Fire safety training. Employees assigned firefighting duties shall be trained to know the locations and proper use of portable fire extinguishers or other manual fire-fighting equipment and the protective clothing or equipment required for its safe and proper use.

~~**406.4**~~**406.3.3 Emergency lockdown training.** Where a facility has a lockdown plan, employees shall be trained on their assigned duties and procedures in the event of an emergency lockdown.

Delete Section 408 (existing Section 408 has been relocated to Section 403) and revise Section 311.1 as follows:

311.1 General. Temporarily unoccupied buildings, structures, premises or portions thereof, including tenant spaces, shall be safeguarded and maintained in accordance with Sections 311.1.1 through 311.5.65.

Add a Section 311.6 as follows:

311.6. 408.11.3 Maintenance-Unoccupied tenant spaces in mall buildings. Unoccupied tenant spaces in covered and open mall buildings shall be:

1. Kept free from the storage of any materials.
2. Separated from the remainder of the building by partitions of at least 0.5-inch-thick (12.7 mm) gypsum board or an *approved* equivalent to the underside of the ceiling of the adjoining tenant spaces.
3. Without doors or other access openings other than one door that shall be kept key locked in the closed position except during that time when opened for inspection.
4. Kept free from combustible waste and be broom swept clean.

Supporting Statement (including intent, need, and impact of the proposal):

This proposal restructures Chapter 4 to place all of the core requirements in the front of the chapter in Section 403. The current code splits such requirements between Section 404.2 and Section 408, making the code difficult to follow and apply. Section 403 in this proposal includes the requirements previously included in Sections 404.2 and 408, which have been merged by occupancy classification or as otherwise appropriate.

This is a replication of ICC Code Change F25-13 that was accepted "As Submitted" on a 14-0 vote at the Dallas CAH, April 2013.

The overall intent of this proposal is editorial revision. Provisions have been relocated and text has been edited in an effort to clarify what is believed to be the current intent without technical change and to improve readability. One section dealing with maintenance of unoccupied tenant spaces in malls was determined to be improperly located in Chapter 4 and was moved to Chapter 3 with other vacant use regulations.

In preparing this proposal, it was noted that the provisions for emergency evacuation drills for Group I-1 (403.7.1.6 of the rewrite) and Group R-4 (403.9.3.6 of the rewrite) are not consistent. This may have been deliberate when Chapter 4 was originally written, but it warrants a review to determine if the inconsistency is appropriate.

One change that was made corrects an error made by the Code Correlation Committee when they made what was believed to be an editorial addition to the code in Section 408.9.3 of the 2012 edition. That addition referenced Section 404.4 for review and updating of evacuation diagrams for any Group R-2 dormitory. The reference to Section 404.4 was incorrect because that section only relates to fire safety and evacuation plans, which are not required for Group R-2 except for college and university buildings. This error has been fixed in Section 403.9.2.3.

Because of the complexity of these revisions in legislative format, a clean copy of the final text is provided below to allow an easier review of the proposed text.

SECTION 403

EMERGENCY PREPAREDNESS REQUIREMENTS

403.1 General. In addition to the requirements of Section 401, occupancies, uses and outdoor locations shall comply with the emergency preparedness requirements set forth in Sections 403.2 through 403.11. Where a firesafety and evacuation plan is required by Sections 403.2 through 403.11, evacuation drills shall be in accordance with Section 405 and employee training shall be in accordance with Section 406.

403.2 Group A occupancies. An *approved* fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for Group A occupancies, other than those occupancies used exclusively for purposes of religious worship with an *occupant load* less than 2,000, and for buildings containing both a Group A occupancy and an atrium. Group A occupancies shall also comply with Sections 403.2.1 through 403.2.4.

403.2.1 Seating plan. In addition to the requirements of Section 404.2, the fire safety and evacuation plans for assembly occupancies shall include a detailed seating plan, *occupant load* and *occupant load* limit. Deviations from the *approved* plans shall be allowed provided the *occupant load* limit for the occupancy is not exceeded and the *aisles* and exit accessways remain unobstructed.

403.2.2 Announcements. In theaters, motion picture theaters, auditoriums and similar assembly occupancies in Group A used for noncontinuous programs, an audible announcement shall be made not more than 10 minutes prior to the start of each program to notify the occupants of the location of the exits to be used in the event of a fire or other emergency.

Exception: In motion picture theaters, the announcement is allowed to be projected upon the screen in a manner *approved* by the *fire code official*.

403.2.2.1 Night clubs. Night clubs shall comply with Sections 408.2.2.1.1 and 408.2.2.1.2.

408.2.2.1.1 Audible announcements. Audible announcements shall be made to the occupants no longer than 10 minutes prior to the start of the entertainment and at each intermission to notify the occupants of the location of the exits to be used in the event of a fire or other emergency.

408.2.2.1.2. Occupant load count. Upon request of the fire code official, the owner or operator, or both, will be required to keep a running count of the occupant load to provide to the fire code official during performance hours of operation, entertainment hours of operation, or both.

403.2.3 Fire watch personnel. Fire watch personnel shall be provided where required by Section 403.11.1.

403.2.4 Crowd managers. Crowd managers shall be provided where required by Section 403.11.3.

403.3 Group B occupancies. An *approved* fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for buildings containing a Group B occupancy where the Group B occupancy has an *occupant load* of 500 or more persons or more than 100 persons above or below the lowest *level of exit discharge*.

403.4 Group E occupancies. An *approved* fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for Group E occupancies and for buildings containing both a Group E occupancy and an atrium. Group E occupancies shall also comply with Section 403.4.1

403.4.1 Group E occupancy college and university buildings. Group E occupancy college and university buildings shall comply with Sections 403.4.1.1 through 403.4.1.3

403.4.1.1 First emergency evacuation drill. The first emergency evacuation drill of each school year shall be conducted within 10 days of the beginning of classes.

403.4.1.2 Time of day. Emergency evacuation drills shall be conducted at different hours of the day or evening, during the changing of classes, when the school is at assembly, during the recess or gymnastic periods, or during other times to avoid distinction between drills and actual fires.

403.4.1.3 Assembly points. Outdoor assembly areas shall be designated and shall be located a safe distance from the building being evacuated so as to avoid interference with fire department operations. The assembly areas shall be arranged to keep each class separate to provide accountability of all individuals.

403.5 Group F occupancies. An *approved* fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for buildings containing a Group F occupancy where the Group F occupancy has an *occupant load* of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge .

403.6 Group H Occupancies. An *approved* fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for Group H occupancies. Group H-5 occupancies shall also comply with Section 403.6.1.

403.6.1 Group H-5 occupancies. Group H-5 occupancies shall comply with Sections 403.6.1.1 through 403.6.1.4

403.6.1.1 Plans and diagrams. In addition to the requirements of Section 404 and Section 407.6, plans and diagrams shall be maintained in *approved* locations indicating the approximate plan for each area, the amount and type of HPM stored, handled and used, locations of shutoff valves for HPM supply piping, emergency telephone locations and locations of exits.

403.6.1.2 Plan updating. The plans and diagrams required by Section 404, 403.6.1.1 and 407.6 shall be maintained up to date and the *fire code official* and fire department shall be informed of major changes.

403.6.1.3 Emergency response team. Responsible persons shall be designated as an on-site emergency response team and trained to be liaison personnel for the fire department. These persons shall aid the fire department in preplanning emergency responses, identifying locations where HPM is stored, handled and used, and be familiar with the chemical nature of such material. An adequate number of personnel for each work shift shall be designated.

403.6.1.4 Emergency drills. Emergency drills of the on-site emergency response team shall be conducted on a regular basis but not less than once every three months. Records of drills conducted shall be maintained.

403.7 Group I occupancies. An *approved* fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for Group I occupancies. Group I occupancies shall also comply with Sections 403.7.1 through 403.7.3

403.7.1 Group I-1 occupancies. Group I-1 occupancies shall comply with Sections 403.7.1.1 through 403.7.1.6

403.7.1.1 Fire safety and evacuation plan. The fire safety and evacuation plan required by Section 404 shall include special employee actions, including fire protection procedures necessary for residents, and shall be amended or revised upon admission of any resident with unusual needs.

403.7.1.2 Employee training. Employees shall be periodically instructed and kept informed of their duties and responsibilities under the plan. Such instruction shall be reviewed by employees at intervals not exceeding two months. A copy of the plan shall be readily available at all times within the facility.

403.7.1.3 Resident training. Residents capable of assisting in their own evacuation shall be trained in the proper actions to take in the event of a fire. The training shall include actions to take if the primary

escape route is blocked. Where the resident is given rehabilitation or habilitation training, training in fire prevention and actions to take in the event of a fire shall be a part of the rehabilitation training program. Residents shall be trained to assist each other in case of fire to the extent their physical and mental abilities permit them to do so without additional personal risk.

403.7.1.4 Drill frequency. Emergency evacuation drills shall be conducted at least six times per year, two times per year on each shift. Twelve drills shall be conducted in the first year of operation.

403.7.1.5 Drill times. Drill times are not required to comply with Section 405.4.

403.7.1.6 Resident participation in drills. Emergency evacuation drills shall involve the actual evacuation of residents to a selected assembly point.

403.7.2 Group I-2 occupancies. Group I-2 occupancies shall comply with Sections 403.7.2.1 through 403.7.2.3.

403.7.2.1 Drill times. Drill times are not required to comply with Section 405.4.

403.7.2.2 Evacuation not required. During emergency evacuation drills, the movement of patients to safe areas or to the exterior of the building is not required.

403.7.2.3 Coded alarm signal. When emergency evacuation drills are conducted after visiting hours or when patients or residents are expected to be asleep, a coded announcement is allowed instead of audible alarms.

403.7.3 Group I-3 occupancies. Group I-3 occupancies shall comply with Sections 403.7.3.1 through 403.7.3.4.

403.7.3.1 Employee training. Employees shall be instructed in the proper use of portable fire extinguishers and other manual fire suppression equipment. Training of new employees shall be provided promptly upon entrance on duty. Refresher training shall be provided at least annually.

403.7.3.2 Employee staffing. Group I-3 occupancies shall be provided with 24-hour staffing. An employee shall be within three floors or 300 feet (91 440 mm) horizontal distance of the access door of each resident housing area. In Conditions 3, 4 and 5, as defined in "Occupancy Classification – Institutional Group I-3" in Chapter 2, the arrangement shall be such that the employee involved can start release of locks necessary for emergency evacuation or rescue and initiate other necessary emergency actions within 2 minutes of an alarm.

Exception: An employee shall not be required to be within three floors or 300 feet (9144 mm) in areas in which all locks are unlocked remotely and automatically in accordance with Section 408.4 of the *International Building Code*.

403.7.3.3 Notification. Provisions shall be made for residents in Conditions 3, 4 and 5, as defined in "Occupancy Classification – Institutional Group I-3" in Chapter 2, to readily notify an employee of an emergency.

403.7.3.4 Keys. Keys necessary for unlocking doors installed in a *means of egress* shall be individually identifiable by both touch and sight.

403.8 Group M occupancies. An *approved* fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for buildings containing a Group M occupancy, where the Group M occupancy has an

occupant load of 500 or more persons or more than 100 persons above or below the lowest *level of exit discharge*, and for buildings containing both a Group M occupancy and an atrium.

403.9 Group R occupancies.

403.9.1 Group R-1 occupancies. An *approved* fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for Group R-1 occupancies. Group R-1 occupancies shall also comply with Sections 403.9.1.1 through 403.9.1.3.

403.9.1.1 Evacuation diagrams. A diagram depicting two evacuation routes shall be posted on or immediately adjacent to every required egress door from each hotel or motel sleeping unit.

403.9.1.2 Emergency duties. Upon discovery of a fire or suspected fire, hotel and motel employees shall perform the following duties:

1. Activate the fire alarm system, where provided.
2. Notify the public fire department.
3. Take other action as previously instructed.

403.9.1.3 Fire safety and evacuation instructions. Information shall be provided in the fire safety and evacuation plan required by Section 404 to allow guests to decide whether to evacuate to the outside, evacuate to an *area of refuge*, remain in place, or any combination of the three.

403.9.2 Group R-2 occupancies. Group R-2 occupancies shall comply with Sections 403.9.2.1 through 403.9.2.3.

403.9.2.1. College and University Buildings. An *approved* fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for Group R-2 college and university buildings. Group R-2 college and university buildings shall also comply with Sections 403.9.2.1 and 403.9.2.2.

403.9.2.1.1 First emergency evacuation drill. The first emergency evacuation drill of each school year shall be conducted within 10 days of the beginning of classes.

403.9.2.1.2 Time of day. Emergency evacuation drills shall be conducted at different hours of the day or evening, during the changing of classes, when the school is at assembly, during the recess or gymnastic periods, or during other times to avoid distinction between drills and actual fires. One required drill shall be held during hours after sunset or before sunrise.

403.9.2.2 Emergency guide. Fire emergency guides shall be provided for Group R-2 occupancies. Guide contents, maintenance and distribution shall comply with Sections 403.9.2.2.1 through 403.9.2.2.3

403.9.2.2.1 Guide contents. Fire emergency guides shall describe the location, function and use of fire protection equipment and appliances accessible to residents, including fire alarm systems, smoke alarms, and portable fire extinguishers. Guides shall also include an emergency evacuation plan for each *dwelling unit*.

403.9.2.2.2 Emergency guide maintenance. Emergency guides shall be reviewed and *approved* by the *fire code official*.

403.9.2.2.3 Emergency guide distribution. A copy of the emergency guide shall be given to each tenant prior to initial occupancy.

403.9.2.3 Evacuation diagrams for dormitories. A diagram depicting two evacuation routes shall be posted on or immediately adjacent to every required egress door from each dormitory sleeping unit. Evacuation diagrams shall be reviewed and updated as needed to maintain accuracy.

403.9.3 Group R-4 occupancies. An *approved* fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for Group R-4 occupancies. Group R-4 occupancies shall also comply with Sections 403.9.3.1 through 403.9.3.6.

403.9.3.1 Fire safety and evacuation plan. The fire safety and evacuation plan required by Section 404 shall include special employee actions, including fire protection procedures necessary for residents, and shall be amended or revised upon admission of a resident with unusual needs.

403.9.3.2 Employee training. Employees shall be periodically instructed and kept informed of their duties and responsibilities under the plan. Such instruction shall be reviewed by employees at intervals not exceeding two months. A copy of the plan shall be readily available at all times within the facility.

403.9.3.3 Resident training. Residents capable of assisting in their own evacuation shall be trained in the proper actions to take in the event of a fire. The training shall include actions to take if the primary escape route is blocked. Where the resident is given rehabilitation or habilitation training, training in fire prevention and actions to take in the event of a fire shall be a part of the rehabilitation training program. Residents shall be trained to assist each other in case of fire to the extent their physical and mental abilities permit them to do so without additional personal risk.

403.9.3.4 Drill frequency. Emergency evacuation drills shall be conducted at least six times per year, two times per year on each shift. Twelve drills shall be conducted in the first year of operation.

403.9.3.5 Drill times. Drills times are not required to comply with Section 405.4.

403.9.3.6 Resident participation in drills. Emergency evacuation drills shall involve the actual evacuation of residents to a selected assembly point and shall provide residents with experience in exiting through all required exits. All required exits shall be used during emergency evacuation drills.

Exception: Actual exiting from windows shall not be required. Opening the window and signaling for help shall be an acceptable alternative.

403.10 Special uses.

403.10.1 Covered and open mall buildings. Covered and open mall buildings shall comply with the requirements of Sections 403.10.1.1 through 403.10.1.5.

403.10.1.1 Malls and mall buildings exceeding 50,000 square feet. An *approved* fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for covered malls exceeding 50,000 square feet (4645 m²) in aggregate floor area and for open mall buildings exceeding 50,000 square feet (4645 m²) in aggregate area within perimeter line.

403.10.1.2 Lease plan. In addition to the requirements of Section 404.2.2, a lease plan that includes the following information shall be prepared for each covered and open mall building:

1. Each occupancy, including identification of tenant.
2. Exits from each tenant space.

3. Fire protection features, including the following:
 - 3.1. Fire department connections.
 - 3.2. *Fire command center*.
 - 3.3. Smoke management system controls.
 - 3.4. Elevators, elevator machine rooms and controls.
 - 3.5. Hose valve outlets.
 - 3.6. Sprinkler and standpipe control valves.
 - 3.7. Automatic fire-extinguishing system areas.
 - 3.8. Automatic fire detector zones.
 - 3.9. *Fire barriers*.

403.10.1.3 Lease plan approval. The lease plan shall be submitted to the *fire code official* for approval, and shall be maintained on site for immediate reference by responding fire service personnel.

403.10.1.4 Lease plan revisions. The lease plans shall be revised annually or as often as necessary to keep them current. Modifications or changes in tenants or occupancies shall not be made without prior approval of the *fire code official* and building official.

403.10.1.5 Tenant identification. Tenant identification shall be provided for secondary exits from occupied tenant spaces that lead to an *exit corridor* or directly to the exterior of the building. Tenant identification shall be posted on the exterior side of the exit or exit access door and shall identify the business name and/or address using plainly legible letters and numbers that contrast with their background.

Exception: Tenant identification is not required for anchor stores.

403.10.1.6 Unoccupied tenant spaces. The fire safety and evacuation plan shall provide for compliance with the requirements for unoccupied tenant spaces in Section 311.

403.10.2 High-rise buildings. An *approved* fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for high-rise buildings.

403.10.3 Underground buildings. An *approved* fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for underground buildings.

403.10.4 SCRF. And approved fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for SRCFs.

403.11 Special requirements for public safety.

403.11.1 Fire watch personnel. When, in the opinion of the *fire code official*, it is essential for public safety in a place of assembly or any other place where people congregate, because of the number of persons or the nature of the performance, exhibition, display, contest or activity, the *owner*, agent or lessee shall provide one or more fire watch personnel, as required and *approved*. Fire watch personnel shall comply with Sections 403.11.1.1 and 403.11.1.2.

403.11.1.1 Duty Times. Fire watch personnel shall remain on duty during the times places requiring a fire watch are open to the public, or when an activity requiring a fire watch is being conducted.

403.11.1.2 Duties. On-duty fire watch personnel shall have the following duties:

1. Keep diligent watch for fires, obstructions to *means of egress* and other hazards
2. Take prompt measures for remediation of hazards and extinguishment of fires that occur

3. Take prompt measures to assist in the evacuation of the public from the structures.

403.11.2 Public safety plan for gatherings. In other than Group A or E occupancies, where the *fire code official* determines that an indoor or outdoor gathering of persons has an adverse impact on public safety through diminished access to buildings, structures, fire hydrants and fire apparatus access roads or where such gatherings adversely affect public safety services of any kind, the *fire code official* shall have the authority to order the development of or prescribe a public safety plan that provides an approved level of public safety and addresses the following items:

1. Emergency vehicle ingress and egress
2. Fire protection
3. Emergency egress or escape routes
4. Emergency medical services
5. Public assembly areas
6. The directing of both attendees and vehicles, including the parking of vehicles
7. Vendor and food concession distribution
8. The need for the presence of law enforcement
9. The need for fire and emergency medical services personnel.

403.11.3 Crowd managers for gatherings exceeding 1,000 people. Where facilities or events involve a gathering of more than 1,000 people, crowd managers shall be provided in accordance with Section 403.11.3.1.

403.11.3.1 Number of crowd managers. The minimum number of crowd managers shall be established at a ratio of one crowd manager for every 250 persons.

Exception: Where *approved* by the *fire code official*, the number of crowd managers shall be permitted to be reduced where the facility is equipped throughout with an *approved automatic sprinkler system* or based upon the nature of the event.

SECTION 404 FIRE SAFETY, EVACUATION AND LOCKDOWN PLANS

404.1 General. Where required by Section 403, fire safety, evacuation and lockdown plans shall comply with Sections 404.2 through 404.4.1.

(existing Section 404.2 is relocated and merged into Section 403 with the remaining sections renumbered)

SECTION 405 EMERGENCY EVACUATION DRILLS

405.1 General. Emergency evacuation drills complying with Sections 405.2 through 405.9 shall be conducted at least annually where firesafety and evacuation plans are required by Section 403 or when required by the *fire code official*. Drills shall be designed in cooperation with the local authorities.

405.2 Frequency. Required emergency evacuation drills shall be held at the intervals specified in Table 405.2 or more frequently where necessary to familiarize all occupants with the drill procedure.

405.3 Leadership. Responsibility for the planning and conduct of drills shall be assigned to competent persons designated to exercise leadership.

405.4 Time. Drills shall be held at unexpected times and under varying conditions to simulate the unusual conditions that occur in case of fire.

405.5 Record keeping. Records shall be maintained of required emergency evacuation drills and include the following information:

1. Identity of the person conducting the drill.
2. Date and time of the drill.
3. Notification method used.
4. Employees on duty and participating.
5. Number of occupants evacuated.
6. Special conditions simulated.
7. Problems encountered.
8. Weather conditions when occupants were evacuated.
9. Time required to accomplish complete evacuation.

**TABLE 405.2
FIRE AND EVACUATION DRILL
FREQUENCY AND PARTICIPATION**

Group or Occupancy	Frequency	Participation
Group A	Quarterly	Employees
Group B ^c	Annually	Employees
Group E	Monthly ^z	All occupants
Group F	Annually	Employees
Group I	Quarterly on each shift	Employees ^b
Group R-1	Quarterly on each shift	Employees
Group R-2 ^d	Four annually	All occupants
Group R-4	Quarterly on each shift	Employees ^b
High-rise buildings	Annually	Employees
SRCF	Monthly	All occupants

- a. In severe climates, the *fire code official* shall have the authority to modify the emergency evacuation drill frequency.
- b. Fire and evacuation drills in residential care assisted living facilities shall include complete evacuation of the premises in accordance with Section 403.9.3.6. Where occupants receive habilitation or rehabilitation training, fire prevention and fire safety practices shall be included as part of the training program.
- c. Group B buildings having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge.
- d. Applicable to Group R-2 college and university buildings in accordance with Section 403.9.2.1.

405.6 Notification. Where required by the *fire code official*, prior notification of emergency evacuation drills shall be given to the *fire code official*.

405.7 Initiation. Where a fire alarm system is provided, emergency evacuation drills shall be initiated by activating the fire alarm system.

405.8 Accountability. As building occupants arrive at the assembly point, efforts shall be made to determine if all occupants have been successfully evacuated or have been accounted for.

405.9 Recall and reentry. An electrically or mechanically operated signal used to recall occupants after an evacuation shall be separate and distinct from the signal used to initiate the evacuation. The recall signal initiation means shall be manually operated and under the control of the person in charge of the premises or the official in charge of the incident.

No one shall reenter the premises until authorized to do so by the official in charge.

SECTION 406 EMPLOYEE TRAINING AND RESPONSE PROCEDURES

406.1 General. Where fire safety and evacuation plans are required by Section 403, employees shall be trained in fire emergency procedures based on plans prepared in accordance with Section 404.

406.2 Frequency. Employees shall receive training in the contents of fire safety and evacuation plans and their duties as part of new employee orientation and at least annually thereafter. Records shall be kept and made available to the *fire code official* upon request.

406.3 Employee training program. Employees shall be trained in fire prevention, evacuation and fire safety in accordance with Sections 406.3.1 through 406.3.4.

406.3.1 Fire prevention training. Employees shall be apprised of the fire hazards of the materials and processes to which they are exposed. Each employee shall be instructed in the proper procedures for preventing fires in the conduct of their assigned duties.

406.3.2 Evacuation training. Employees shall be familiarized with the fire alarm and evacuation signals, their assigned duties in the event of an alarm or emergency, evacuation routes, areas of refuge, exterior assembly areas and procedures for evacuation.

406.3.3 Fire safety training. Employees assigned firefighting duties shall be trained to know the locations and proper use of portable fire extinguishers or other manual fire-fighting equipment and the protective clothing or equipment required for its safe and proper use.

406.4 Emergency lockdown training. Where a facility has a lockdown plan, employees shall be trained on their assigned duties and procedures in the event of an emergency lockdown.

CHAPTER 3

311.1 General. Temporarily unoccupied buildings, structures, premises or portions thereof, including tenant spaces, shall be safeguarded and maintained in accordance with Sections 311.1.1 through 311.5.6.

311.6. Unoccupied tenant spaces in mall buildings. Unoccupied tenant spaces in covered and open mall buildings shall be:

1. Kept free from the storage of any materials.
2. Separated from the remainder of the building by partitions of at least 0.5-inch-thick (12.7 mm) gypsum board or an *approved* equivalent to the underside of the ceiling of the adjoining tenant spaces.
3. Without doors or other access openings other than one door that shall be kept key locked in the closed position except during that time when opened for inspection.
4. Kept free from combustible waste and be broom swept clean.

Submittal Information

Date Submitted: 6/3/2013

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 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual X Government Entity Company

Name: Ed Altizer

Representing: State Fire Marshal's Office

Mailing Address: 1005 Technology Park Drive, Glen Allen, VA 23059

Email Address: ed.altizer@vdfp.virginia.gov

Telephone Number: 804-371-0220

Proposal Information

Code(s) and Section(s): SFPC Section 404.2 and 405.5.1

Proposed Change (including all relevant section numbers, if multiple sections):

404.2 Where required. An *approved* fire safety and evacuation plan shall be prepared and maintained for the following occupancies and buildings.

1. Group A, other than Group A occupancies used exclusively for purposes of religious worship that have an *occupant load* less than 2,000.
2. Group B buildings having an *occupant load* of 500 or more persons or more than 100 persons above or below the *lowest level of exit discharge*.
3. Group E.
4. Group F buildings having an *occupant load* of 500 or more persons or more than 100 persons above or below the *lowest level of exit discharge*.
5. Group H.
6. Group I.
7. Group R-1.
8. Group R-2 college and university buildings.
9. Group R-4.
10. High-rise buildings.
11. Group M buildings having an *occupant load* of 500 or more persons or more than 100 persons above or below the *lowest level of exit discharge*.
12. Covered malls exceeding 50,000 square feet (4645 m²) in aggregate floor area.
13. Open mall buildings exceeding 50,000 square feet (4645 m²) in aggregate area within perimeter line.
14. Underground buildings.
15. Buildings with an atrium and having an occupancy in Group A, E or M.
16. SRCF.
17. Group R-3 and R-5 bed and breakfast and other transient boarding facilities that are either proprietor or non-proprietor occupied.

404.5 Availability. Fire safety and evacuation plans shall be available in the workplace for reference and review by employees, and copies shall be furnished to the *fire code official* for review upon request.

404.5.1 Distribution. The fire safety and evacuation plans shall be distributed to the tenants and building service employees by the *owner* or *owner's agent*. Tenants shall distribute to their employees applicable parts of the fire safety plan affecting the employees' actions in the event of a fire or other emergency. Fire safety and evacuation plans shall be made available by the proprietor of Group R-3 and R-5 bed and breakfast and other transient boarding facilities to transient guests upon their arrival or are present in each transient guest room.

Supporting Statement (including intent, need, and cost impact of the proposal):

For the same reasons fire safety and evacuation information is to be provided to hotel and motel guests (Group R-1), it should be made to guests of B&Bs (R-3 and R-5). These guests are transient and not readily familiar with the building and may only be present for one night.

The proposed requirement is not intended to be a vehicle to require the installation of equipment beyond what is required by the USBC for these specific transient facilities. Nor is there a requirement to conduct drills. By example, while the fire code requires a fire safety plan to contain the procedures to report a fire or other emergency, or location of "occupant-use hose stations", the plan for B&Bs would only note the procedure for reporting an emergency and would be silent on hose stations. The proposed change could not be used to get hose stations installed. The same is said of the "identification and assignment of personnel responsible for maintenance of systems and equipment installed to prevent or control fires" versus showing a primary and secondary evacuation route out of the building. The plan would show the routes out of a building but would be silent on maintenance of systems and equipment. Only those items in Sections 404.3 and 404.3.2 that are within the nature of B&Bs would be listed in the plan's content.

Submittal Information

Date Submitted: X/XX/13 by GAD for SFMO

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 SBCO (State Building Codes Office)
600 East Main Street
Suite 300
Richmond, VA 23219

Email Address: Vernon.hodge@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7150



VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Joel S. Baker

Representing: County of Roanoke

Mailing Address: 5204 Bernard Drive, Roanoke, VA 24018

Email Address: jbaker@roanokecountyva.gov

Telephone Number: 540-776-7300

Proposal Information

Code(s) and Section(s): 503.1, Exception 1

Proposed Change (including all relevant section numbers, if multiple sections):

Modify Exception 1.

In lieu of the requirements of this section and Sections 503.2 and 503.3, fire apparatus access roads shall be permitted to be provided, constructed and maintained in accordance with written policy and standards that establish fire apparatus access road requirements and such requirements shall be identified to the owner or his agent prior to the building official's approval of the building permit.

Supporting Statement (including intent, need, and cost impact of the proposal):

Would permit a locality that has developed local private street construction standards to also include design and construction standards for fire apparatus access roads when such standards are utilized.

When a locality chooses to develop private street and road standards, they should also be permitted to include the design of fire apparatus access roads as part of that standard. The current Section 503 allows a locality to make an exception for requiring access roads initially through a local written policy, but does not appear to permit a locality to also develop the design standards. This would give the locality that ability in order to address specific local conditions.

This change would not increase and has the potential to decrease construction costs.

Submittal Information

Date Submitted: 02/20/2013

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 SBCO (State Building Codes Office)
600 East Main Street

Email Address: Vernon.hodge@dhcd.virginia.gov

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information (Check one): Individual Government Entity Company

Name: Robby Dawson Representing: Fire Services Board Code Committee

Mailing Address: 1005 Technology Park Drive, Glen Allen, VA 23059

Email Address: dawsonj@chesterfield.gov Telephone Number: 804-748-1426

Proposal Information

Code(s) and Section(s): SFPC – listed sections for deletion of existing building references

Proposed Change (including all relevant section numbers, if multiple sections):

Change Section 607.1 to read:

~~607.1 Emergency Operation.~~ Existing elevators with a travel distance of 25 feet (7620 mm) or more shall comply with the requirements in Chapter 11. ~~New elevators shall be provided with Phase I emergency recall operation and Phase II emergency in-car operation in accordance with ASME A17.1 of Section 506.3 and the Virginia Maintenance Code (13VAC5-63-450).~~

Change Section 704.1 to read:

~~704.1 Enclosure.~~ Interior vertical shafts including, but not limited to, stairways, elevator hoistways, service and utility shafts, that connect two or more stories of a building shall be enclosed or protected as required in Chapter 11. New floor openings in existing buildings shall comply with the *International Building Code*.

Change Section 903.6 to read:

~~903.6 Where required in existing buildings and structures.~~ An automatic sprinkler system shall be provided in existing buildings and structures where required in Chapter 11 in accordance with Section 102.7 of this code.

Delete Section 905.11:

~~905.11 Existing buildings.~~ Where required in Chapter 11, existing structures shall be equipped with standpipes installed in accordance with Section 905.

Change Section 907.1 to read:

~~907.1 General.~~ This section covers the application, installation, performance and maintenance of fire alarm systems and their components in new and existing buildings and structures. The requirements of Section 907.2 are applicable to new buildings and structures. ~~The requirements of Section 907.9 are applicable to existing buildings and structures.~~

Delete Section 907.9:

~~907.9 Where required in existing buildings and structures.~~ An approved fire alarm system shall be provided in existing buildings and structures where required in Chapter 11.

Change Section 1029.4 to read:

[B] 1029.4 Operational constraints. *Emergency escape and rescue openings* shall be operational from the inside of the room without the use of keys or tools. Bars, grilles, grates or similar devices are permitted to be placed over *emergency escape and rescue openings* provided the minimum net clear opening size complies with Section 1029.2 and such devices shall be releasable or removable from the inside without the use of a key, tool or force greater than that which is required for normal operation of the

escape and rescue opening. ~~Where such bars, grilles, grates or similar devices are installed in existing buildings, and where smoke alarms shall be~~ installed in accordance with Section 907.2.11 ~~and approved by the building official~~ regardless of the valuation of the *alteration*.

Change title page to read:

Chapters ~~1211~~ through 19
Reserved

Supporting Statement (including intent, need, and impact of the proposal):

Along with the continued deletion of Chapter 11 for construction requirements for existing buildings out of the SFPC, this change is to delete or change those other sections within the body of the SFPC that still make reference to a chapter that's deleted or provide for an obvious conflict with the USBC.

The change to Section 1029.4 is to ensure bars, grills, grates and other such barriers are not installed without some other compensating measure for ensuring safety and egress.

Submittal Information

Date Submitted: 12/7/12

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 2012 Code Change Cycle

Code Change Number: _____

Proponent Information (Check one): Individual Government Entity Company

Name: Robby Dawson Representing: Fire Services Board Code Committee

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): Modified 609.3.3.3; New 609.3.3.3.1

Proposed Change (including all relevant section numbers, if multiple sections):

Add new text as follows:

609.3.3.3 Records. Records for inspections shall state the individual and company performing the inspection, a description of the inspection and when the inspection took place. Records for cleanings shall state the individual and company performing the cleaning and when the cleaning took place. Such records shall be completed after each inspection or cleaning, and maintained on the premises for a minimum of three years and be copied to the *fire code official* upon request.

609.3.3.3.1 Tags. Where a commercial kitchen hood or duct system is cleaned, a tag containing the service provider name, address, telephone number and date of service shall be provided in a conspicuous location. Prior tags shall be covered or removed.

Exception: Where records required by Section 609.3.3.3 are maintained on the premises.

Supporting Statement (including intent, need, and cost impact of the proposal):

The new language requires a tag or similar posting of when the last cleaning was completed. This is presently being done by a number of cleaning contractors and has proven to be beneficial while conducting inspections in the field for determining cleaning effectiveness.

The proposed text clarifies necessary marking requirements to visually confirm serviceability of commercial kitchen hood and ducting systems. The text is consistent with the requirements set forth in ANSI/KECA C-10, which is proposed for adoption by a separate code change.

This is a replication of ICC/IFC Code Change F93-13 that was recommended for approval at the Dallas CAH with a 14-0 committee vote, with the addition of an exception that allows the business owner to maintain other written reports or documentation on site as previously required. This would allow small businesses who maintain their records locally to continue with their present practice and require larger chain operators to have some form of documentation of the cleaning of the hood in order to show the inspector when the hood was cleaned. Many larger chain operators maintain records centrally and do not have these available at the business location.

Submittal Information

Date Submitted: 6/3/2013

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 SBCO (State Building Codes Office)
600 East Main Street
Suite 300
Richmond, VA 23219

Email Address: Vernon.hodge@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7150



VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: DHCD Placeholder

Representing: _____

Mailing Address: _____

Email Address: _____

Telephone Number: _____

Proposal Information

Code(s) and Sections (s): SFPC IFC 703.1.1

Proposed Change (including all relevant section numbers, if multiple sections):

703.1.1 Delete "~~Such elements shall be visually inspected by the owner annually and properly repaired, restored or replaced when damaged, altered, breached or penetrated.~~"

Supporting Statement (including intent, need, and impact of the proposal):

The STRB recently rendered a decision that stated 703.1 was not enforceable in the SFPC as it was preempted by SFPC administrative provisions on 1043.2 and 109.1. This is a new section that also needs to be vetted with building owners to determine the annual cost, need, risks and what buildings will be covered and how will that be determined by an owner or fire official without assistance from the building department Is now such periodic: inspections are on building elements covered? Done now.

Submittal Information

Date Submitted: 6/25/13

The proposal may be submitted by email as an attachment, by fax, by mail, or by hand delivery.

Please submit the proposal to:

DHCD DEBAR State Building Codes Office
600 East Main Street,
Suite 300
Richmond, VA 23219

Email Address: vernon.hodge@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7150

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information (Check one): Individual Government Entity Company

Name: Ed Altizer Representing: State Fire Marshal's Office

Mailing Address: 1005 Technology Park Drive, Glen Allen, VA 23059

Email Address: ed.altizer@vdfp.virginia.gov Telephone Number: 804-371-0220

Proposal Information

Code(s) and Section(s): SFPC Section 902.3 and 906.4

Proposed Change (including all relevant section numbers, if multiple sections):

Add new definition to Section 202 to read as follows:

Fire Extinguisher Service Technician. A person who is experienced and trained and has available the appropriate servicing manual(s), the proper type of tools, recharge materials, lubricants, and manufacturer's recommended replacement parts or parts specifically listed for use in fire extinguishers.

Add the following to the list of definitions in Section 902.1:

Fire Extinguisher Service Technician.

Delete Section 906.2.1 in its entirety without substitution.

~~**906.2.1 Certification of service personnel for portable fire extinguishers.** Service personnel providing or conducting maintenance on portable fire extinguishers shall possess a valid certificate issued by an *approved* governmental agency, or other *approved* organization for the type of work performed.~~

Change Sections 906.3 and 906.4 to read as follows and renumber subsequent sections.

906.3 Certification of portable fire extinguisher service personnel. Effective nine (9) months after the effective date of this edition of the SFPC, the maintenance, servicing, and recharging of portable fire extinguishers shall be performed by trained and certified personnel, or shall be performed by personnel under the direct on-site supervision of a trained and certified person.

906.3.1 Certification of service personnel. Certification as a Fire Extinguisher Service Technician shall be obtained from the SFMO. The SFMO shall process all applications for certification as a fire extinguisher service technician and issue a certificate to an applicant upon:

1. Providing proof of having completed any fire extinguisher manufacturer's fire extinguisher service equipment certification program, and

2. Providing proof that the applicant has:

a. An existing and valid certification or license to perform service on fire extinguishers issued by any other state or federal government entity or;

b. Successfully completed the ICC/NAFED Fire Extinguisher Technician Certification program.

906.3.2 Fee for certification. The fee for obtaining or renewing a certificate as a fire extinguisher service technician from the SFMO shall be \$90 and shall accompany the application to obtain a certificate.

906.3.2.1 Fee for replacement certificate. A written request for a replacement certificate shall be accompanied the payment of an administrative fee in the amount of twenty dollars (\$20.00) made payable to the Treasurer of Virginia. Verbal requests shall not be accepted.

906.3.3 Expiration and renewal of a certification. A certificate as a fire extinguisher service technician shall be valid for three years from the date of issuance, but no earlier than January 1, 201x, unless renewed for another three year period. It will be the applicant's responsibility to provide a change of address notice to the SFMO and to renew a certificate in a timely manner. A renewed three year certificate will be issued to an applicant upon:

1. Providing proof to the SFMO the applicant is in possession of an existing and valid certification or license to perform service on fire extinguishers issued by any other state or federal government entity with an expiration date set at a minimum of two years beyond the date the application is received by the SFMO or;
2. Providing proof of continued maintenance of the ICC/NAFED Fire Extinguisher Technician Certification.

Failure to renew a certificate in a timely manner will be sufficient cause for the applicant to apply for a certificate in accordance with Section 906.3.1 in the same manner as for a new certificate.

906.3.4 Denial, suspension or revocation of a certificate. If issuance or renewal of a certificate is denied, or upon the filing of a complaint against the applicant or certificate holder for non-performance, or performance in violation of the SFPC and the referenced NFPA 10 standard, the State Fire Marshal may convene a 3-member panel to hear the particulars of the complaint or denial. The 3-member panel will be comprised of the following persons:

1. A Virginia Certified Fire Official excluding any person certified as a fire extinguisher service technician or is on the staff of the SFMO.
2. A Virginia certified Fire Extinguisher Service Technician who is not associated in any way with the person against whom a complaint is lodged and whose work or employer is geographically remote, as much as practically possible, from the person to whom a complaint is lodged.
3. A member of the general public who does not have a vested financial interest in the servicing of portable fire extinguishers.

Upon the State Fire Marshal convening such panel, the hearing is to commence within 60 calendar days of the filing of the complaint or denial. The 3-member panel is to hear the complaint and render a written recommendation to the State Fire Marshal for certificate issuance, no action, revocation, or suspension of a certificate for a period not to exceed 6 months.

Notwithstanding the discretionary decision and action to convene such panel, the State Fire Marshal reserves the authority to choose an action that may be contrary to the panel's recommendation. The written decision of the State Fire Marshal is to be delivered to the party within 14 days of the hearing's conclusion. If the certificate is denied, revoked or suspended by the SFMO, in accordance with SFPC Section 112.9 the party may file an appeal with the State Technical Review Board (TRB). The party's appeal to TRB must be filed within 14 calendar days of the receipt of the State Fire Marshal's written decision to deny, revoke, or suspend.

The denial, revocation or suspension of a license is independent of any criminal proceedings that may

be initiated by any state or local authority.

906.3.4.1 Replacement of revoked certificate. Any person whose certificate as a Fire Extinguisher Service Technician was revoked upon cause may apply for certification as a Fire Extinguisher Service Technician six months from the date of the revocation and upon compliance with Section 906.3.1. All elements of Section 906.3.1 are required to be obtained and dated after the date of revocation.

906.3.4.2 Return of suspended certificate. Any certificate that was suspended upon cause will be reinstated at the end of the suspension period without change to its expiration date.

906.4 Tags or Labels. In addition to the requirements of NFPA 10 as referenced in Section 906.2, tags or labels intended for recording maintenance or recharging shall bear the certificate number and signature of the certified fire extinguisher service technician who performed the service or who provided direct, on-site supervision of non-certified persons who performed the maintenance or recharging work.

Supporting Statement (including intent, need, and impact of the proposal):

The Virginia Statewide Fire Prevention Code (VSFPC) references the 2010 Edition of NFPA Standard #10 for the selection, installation and maintenance of portable fire extinguishers. As paraphrased in IFC Section 906.2.1, it requires all *“persons performing maintenance and recharging of extinguishers to be certified”* and that *“certification require that a person pass a test administered by an organization acceptable to the AHJ.”*

The standard expresses the minimum requirements that apply to the selection, installation, inspection, maintenance, and testing of portable fire extinguishers which are intended as a first line of defense to cope with fires of limited size. The selection and installation of extinguishers is independent of whether or not a building is protected by automatic sprinklers or any other built-in fire protection systems or equipment.

The National Association of Fire Equipment Distributors (NAFED) has had a long-standing certification program but has recently joined with the International Code Council (ICC) to produce a nationally recognized examination and certification program. The ICC/NAFED certification can be used as proof the individual has demonstrated the minimum knowledge and competency needed to be a “Certified Person” as defined in the reference standard.

The ICC/NAFED exam and certification is not redundant to a training and certification program that may be required by a particular manufacturer who supplies portable fire extinguisher parts. If a service technician wishes to service a particular brand of portable fire extinguisher, the manufacturer may still maintain and require their specific certification program as a condition of supplying brand parts. It must be clearly stated and understood, the ICC/NAFED exam and certification is **not brand specific** but tests the person’s knowledge of the controlling NFPA standard on the selection, placement, maintenance and testing of portable fire extinguishers regardless of the brand or manufacturer.

As an accommodation, an applicant may have a certification or license issued by another governmental entity to perform the work. Towards obtaining the SFMO certificate, this other governmental certification or license can be offered or used as an alternative to undergoing the ICC/NAFED examination process.

To date in Virginia, a company or individual does not have to demonstrate knowledge or competence in the regulating codes and standards in order to conduct a business for the servicing of portable fire extinguishers. Because of that, many owners of portable fire extinguishers and local fire officials have expressed concerns about the potential for fraudulent practices and, short of criminal charges, have little or no civil recourse for challenging the credentials, knowledge and competency of those suspected of fraudulent practices. Having a state program to certify service personnel as proposed will have a two-fold benefit. The first is to provide comfort and assurance to fire officials and owners of fire extinguishers that service personnel by demonstration do possess the necessary knowledge and competency for the servicing and maintenance of extinguishers and second, short of criminal proceedings, to provide an administrative enforcement

mechanism to resolve or intervene in alleged violations of the SFPC as they may relate to a service technician's competency and ability to perform the needed service.

This proposed change describes a basic process for service personnel to obtain or renew a certificate to perform extinguisher maintenance and recharging of portable fire extinguishers. **This certification would NOT be applicable to those who perform the routine monthly check or "inspection" as defined and outlined in NFPA 10.**

This change also provides an internal process available at the State Fire Marshal's discretion that's intended to be used as a means to assist or advise the State Fire Marshal in a determination to take no action, or to deny, revoke or suspend a person's certificate based on allegations that the servicing of fire extinguishers was not performed in compliance with the requirements as set forth in the VSFPC and its referenced standard. If the State Fire Marshal takes an adverse action against a certificate holder, whether that action is taken with or without the assistance of a convened panel, the individual against whom the action was taken retains the option of filing an appeal because, the proposed process would not supplant, subvert or avoid criminal proceedings, such as for fraudulent practices, the issuance of a notice of violation, a summons, or the duty, power or authority of the State Technical Review Board as established and provided for in §§ 36-108 through 36-117 of the Code of Virginia.

Submittal Information

Date Submitted: 6/3/13 by GAD for SFMO

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 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Ron Reynolds

Representing: SFMO

Mailing Address: 1005 Technology Park Drive, Glen Allen, VA 23059

Email Address: ron.reynolds@vdfp.virginia.gov

Telephone Number: 804-612-7268

Proposal Information

Code(s) and Section(s): SFPC 5001.3

Proposed Change (including all relevant section numbers, if multiple sections):

5001.3 Performance-based design alternatives. When approved by the fire code official, buildings and facilities where hazardous materials are stored, used or handled shall be permitted to comply with ~~this section~~ NFPA 45 or Sections 5001.3.1 through 5001.3.3.17 as an alternative to compliance with the other requirements set forth in this chapter and Chapters 51 through 67.

Add the following standard to Chapter 80, Referenced Standards:
NFPA 45-11, Standard on Fire Protection for Laboratories Using Chemicals

Supporting Statement (including intent, need, and cost impact of the proposal):

NFPA is a nationally recognized laboratory safety standard. Adding NFPA 45 gives laboratories a reliable means to secure the safety of laboratories in buildings built before the building codes addressed the "control area" concept. NFPA 45 allows for greater use of upper level floors by not limiting the number of laboratories, but by limiting the amount of combustible and flammable liquids on a per footage basis. NFPA 45 breaks down laboratories into four levels of "Fire Hazard Classes": A, B, C, or D. At higher level floors, the fire separation requirements become greater if the Fire Hazard Class increases. The concept allows the firefighter or inspector to quickly evaluate the level of hazard in each laboratory.

For example, a lab with an "A" Fire Hazard Classification could not be greater than 10,000 sq. ft., with a two hour separation on floors 1-3 only, and would not be allowed on higher floors. The maximum quantity of Class I liquids for use and storage would be 20 (twenty) gallons per 100 sq. ft.

A lab with a "D" classification could be any size, of any number, on any floor, and would not require any fire separation. The maximum gallons in use and storage of Class I liquids would be 2 (two) gallons per 100 sq. ft.

This proposal should result in lower costs to owners of research laboratories that are limited in fully utilizing their buildings.

Submittal Information

Date Submitted: 6-3-13

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 SBCO (State Building Codes Office)
600 East Main Street
Suite 300
Richmond, VA 23219

Email Address: Vernon.hodge@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7150



VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

*Agenda -
USBC
#28
#185FPC*

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Ed Altizer and Claude Hutton

Representing: SFMO

Mailing Address: VDFP, 1005 Technology Park Drive, Glen Allen, VA 23059

Email Address: Ed.Altizer@vdfp.virginia.gov

Telephone Number: 804-612-7267

Proposal Information

Code(s) and Section(s): USBC, Section 307.1

Proposed Change (including all relevant section numbers, if multiple sections):

Add Exception #14 to Section 307.1 as follows:

14. Laboratory buildings and facilities in which hazardous materials are stored, used or handled in compliance with NFPA 45.

Add the following standard to Chapter 35, Referenced Standards:

NFPA 45-11, Standard on Fire Protection for Laboratories Using Chemicals

Supporting Statement (including intent, need, and cost impact of the proposal):

NFPA is a nationally recognized laboratory safety standard. Adding NFPA 45 gives laboratories a reliable alternative to secure the safety of laboratories in new construction allowing for greater use of upper level floors by not limiting the number of laboratories, but by limiting the amount of combustible and flammable liquids on a density and maximum quantity basis. NFPA 45 breaks down laboratories into four levels of "Fire Hazard Classes": A, B, C, or D. At higher level floors, the fire separation requirements become greater if the Fire Hazard Class increases. The concept allows the firefighter or inspector to quickly evaluate the level of hazard in each laboratory. This approach is not the exact same as that of "control areas".

NFPA addresses laboratories which have a very controlled environment, staff trained and experienced in use and handling chemicals to a greater extent than the typical industrial environment. Hazards in laboratories are generally spread out physically and often are subdivided with work areas, partitions, or walls, not open like a typical industrial setting.

Submittal Information

Date Submitted: June 28, 2013

3.3.46 Open Plan Building. A building having rooms, spaces, and corridors delineated by tables, chairs, desks, bookcases, counters, low-height partitions, floor patterns, or any similar finishes or furnishings.

3.3.47 Organic Peroxide. Any organic compound having a double oxygen or peroxy (-O-O-) group in its chemical structure.

3.3.48* Oxidizer. Any material that readily yields oxygen or other oxidizing gas, or that readily reacts to promote or initiate combustion of combustible materials.

3.3.49 Pilot Plant. An experimental assembly of equipment for exploring process variables or for producing semicommercial quantities of materials.

3.3.50 Pressurized Liquid Dispensing Container (PLDC). DOT-, United Nations- (UN-), or ASME-approved containers which are designed for the pressure dispensing of liquids at the specified maximum allowable working pressure of the container.

3.3.51 Pyrophoric Gas. A gas that will spontaneously ignite in air at or below a temperature of 54.4°C (130°F).

3.3.52 Qualified Person. A person who, by possession of a recognized degree, certificate, professional standing, or skill, and who, by knowledge, training, and experience, has demonstrated the ability to deal with problems relating to a particular subject matter, work, or project.

3.3.53 Reactive Material. A material that, by itself, is readily capable of detonation, explosive decomposition, or explosive reaction at normal or elevated temperatures and pressures. (See B.2.5 for definitions of Instability 2, 3, or 4.)

3.3.54 Refrigerating Equipment. Any mechanically operated equipment used for storing materials below normal ambient temperature, including refrigerators, freezers, and similar equipment. (See 12.2.2 and A.12.2.2.)

3.3.55 Safety Can. A listed container, of not more than 18.9 L (5 gal) capacity, having a spring-closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure.

3.3.56 Sash. A movable panel or panels set in the hood entrance. (See C.5.1.)

3.3.57* Storage Cabinet. A cabinet for the storage of flammable and combustible liquids constructed in accordance with Section 9.5 of NFPA 30, *Flammable and Combustible Liquids Code*.

3.3.58 Street Floor. A story or floor level accessible from the street or from outside the building at ground level, with the floor level at the main entrance located not more than three risers above or below ground level, and arranged and utilized to qualify as the main floor. [101, 2009]

3.3.59* Unattended Laboratory Operation. A laboratory procedure or operation at which there is no person present who is knowledgeable regarding the operation and emergency shut-down procedures.

Chapter 4 Laboratory Unit Hazard Classification

4.1 General.

4.1.1 This chapter shall classify laboratory units based on the amount of flammable and combustible liquids in use within the unit.

4.1.2 This chapter also shall define the existence of an explosion hazard in a laboratory unit or in a laboratory work area.

4.1.3 This chapter shall further define limitations on instructional laboratory units.

4.2 Laboratory Unit Fire Hazard Classification.

4.2.1* Classifications.

4.2.1.1 Laboratory units shall be classified as Class A (high fire hazard), Class B (moderate fire hazard), Class C (low fire hazard), or Class D (minimal fire hazard), according to the quantities of flammable and combustible liquids specified in Table 10.1.1(a) and Table 10.1.1(b).

4.2.2 Additional Requirements for Educational and Instructional Laboratory Units.

4.2.2.1 Instructional laboratory units shall be classified as Class C or Class D laboratory units.

4.2.2.2 Educational laboratory units shall be classified as Class D or shall be limited to 50 percent of the flammable and combustible liquids quantity for Class C laboratory units presented in Table 10.1.1(a) and Table 10.1.1(b).

4.3 Laboratory Work Area and Laboratory Unit Explosion Hazard Classification.

4.3.1* A laboratory work area shall be considered to contain an explosion hazard if an explosion of quantities or concentrations of materials could result in serious or fatal injuries to personnel within that laboratory work area. Such quantities or concentrations include, but are not limited to, the following (see Annex C):

- (1) Storage of greater than 0.45 kg (1 lb) of materials with an instability hazard rating of 4 (see B.2.5)
- (2) Use or formation of greater than 0.11 kg (0.25 lb) of materials with an instability hazard rating of 4 (see B.2.5)
- (3)* Presence of highly exothermic reactions in glass or open reaction vessels involving more than 10 g (0.35 oz) of materials such as polymerizations, oxidations, nitrations, peroxidations, hydrogenations, or organo-metallic reactions
- (4) Use or formation in glass or open reaction vessels involving more than 10 g (0.35 oz) of materials whose chemical structures indicate a potential hazard, but whose properties have not been established, such as salts of alkenes, triple bonds, epoxy radicals, nitro and nitroso compounds, and peroxides
- (5) Presence of high-pressure reactions (see Figure C.4.5)
- (6) Other explosion hazards as determined by a qualified person

4.3.2 A laboratory unit shall not be considered to contain an explosion hazard unless a laboratory work area within that unit contains an explosion hazard great enough to cause major property damage or serious injury outside that laboratory work area.

Chapter 5 Laboratory Unit Design and Construction

5.1 Laboratory Unit Enclosure.

5.1.1 The required construction of laboratory units shall be in accordance with Table 5.1.1.

5.1.2 The construction requirements shall be the minimum permitted and shall not exclude the use of construction with greater fire resistance.

Table 5.1.1 Separation Requirements and Height Allowances for Laboratory Units

Laboratory Unit ^a	Area of Lab Unit	Fire Separation ^b	Permitted Stories Above Grade
A	≤929 m ² (≤10,000 ft ²)	2 hours	1-3 ^c
	>929 m ² (>10,000 ft ²)	Not permitted ^d	
B	≤929 m ² (≤10,000 ft ²)	1 hour	1-3 ^c
	≤929 m ² (≤10,000 ft ²)	2 hours	4-6 ^c
	>929 m ² (>10,000 ft ²)	Not permitted ^d	
C	Any size	Not required	1-3
	Any size	1 hour	4-6
	Any size	2 hours	Over 6
D	Any size	Not required	No limit

^aRefer to Table 10.1.1 for laboratory unit classification.

^bSeparation in this table refers to separation from laboratory unit(s) to non-laboratory areas and/or separations from laboratory unit(s) of equal or lower hazard classification.

^cNot allowed in structures below grade.

^dLabs of this classification and size are not permitted.

5.1.3 Regardless of the construction and fire protection requirements for laboratory units that are specified in Table 5.1.1, laboratory units in educational occupancies shall be separated from non-laboratory areas by 1-hour construction.

5.1.4 Table 5.1.1 shall pertain to laboratory units protected by automatic sprinkler systems in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*. Where water will create a serious fire or personnel hazard, a suitable nonwater automatic extinguishing system shall be permitted to be an acceptable substitute for sprinklers.

5.1.5 Penetrations through fire-rated floor/ceiling, floor, and wall assemblies shall be protected in accordance with NFPA 101, *Life Safety Code*.

5.1.6 Floors shall be sealed to prevent liquid leakage to lower floors.

5.1.7 Floor openings, floor penetrations, and floor firestop systems shall be sealed or curbed to prevent liquid leakage to lower floors.

5.1.8 Door assemblies in required 1-hour-rated fire separations shall be ¾-hour rated. Door assemblies in required 2-hour-rated fire separations shall be 1½-hour rated.

5.1.9 Window assemblies shall be permitted in fire-rated wall assemblies having a required fire resistance rating of 1 hour or less.

5.1.9.1 Window assemblies shall be of an approved type and shall have a fire protection rating in accordance with NFPA 101, *Life Safety Code*.

5.1.9.2 Fire window assemblies shall be installed in accordance with NFPA 80, *Standard for Fire Doors and Other Opening Protectives*.

5.1.10* Openings in fire-rated floor/ceiling and wall assemblies for air-handling ductwork or air movement shall be protected in accordance with NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*.

5.2 Maximum Area of Laboratory Units. The maximum area of a laboratory unit shall be determined by the fire hazard classification and the construction of the laboratory unit, as shown in Table 5.1.1.

5.3 Requirements for Life Safety. Life safety features for laboratory buildings, laboratory units, and laboratory work areas shall comply with NFPA 101, *Life Safety Code*, unless otherwise modified by other provisions of this standard.

5.3.1 Class A, B, and C laboratory units shall be classified as industrial occupancies in accordance with NFPA 101, *Life Safety Code*.

5.3.2 Educational laboratory units shall be classified as educational occupancies in accordance with NFPA 101, *Life Safety Code*.

5.3.3 Instructional laboratory units and Class D laboratories shall be classified as business occupancies in accordance with NFPA 101, *Life Safety Code*.

5.3.4 Life safety requirements for instructional laboratory units for past the 12th grade, and for Class D laboratories located in facilities classified as business occupancies, shall be in accordance with the requirements for business occupancies of NFPA 101, *Life Safety Code*.

5.4 Means of Access to an Exit.

5.4.1* A second means of access to an exit shall be provided from a laboratory work area if any of the following situations exist:

- (1) A laboratory work area contains an explosion hazard located so that an incident would block escape from or access to the laboratory work area.
- (2) A laboratory work area within a Class A laboratory unit exceeds 46.5 m² (500 ft²).
- (3) A laboratory work area within a Class B, Class C, or Class D laboratory unit exceeds 93 m² (1000 ft²).
- (4) A hood in a laboratory work area is located adjacent to the primary means of exit access.
- (5) A compressed gas cylinder larger than lecture bottle size [approximately 5 cm × 33 cm (2 in. × 13 in.)] is located such that it could prevent safe egress in the event of accidental release of cylinder contents.
- (6) A cryogenic container is located such that it could prevent safe egress in the event of accidental release of container contents.

5.4.2 The required exit access doors of all laboratory work areas within Class A or Class B laboratory units shall swing in the direction of exit travel.

5.4.3* The required exit access doors of all laboratory work areas within Class C or Class D laboratory units shall be permitted to swing against the direction of exit travel or shall be permitted to be a horizontal sliding door complying with NFPA 101, *Life Safety Code*.

5.4.4 Emergency lighting facilities shall be provided for any laboratory work area requiring a second means of access to an exit, in accordance with 5.4.1.

5.4.5 Emergency lighting in laboratory work areas and exits shall be installed in accordance with Section 7.9, Emergency Lighting, of NFPA 101, *Life Safety Code*.

5.5* **Furniture, Casework, and Equipment.** Furniture, casework, and equipment in laboratory units shall be arranged so that means of access to an exit can be reached easily from any point.

5.6 **Electrical Installation.** All electrical installations, including wiring and appurtenances, apparatus, lighting, signal systems, alarm systems, remote control systems, or parts thereof, shall comply with NFPA 70, *National Electrical Code*.

5.6.1 Electrical receptacles, switches, and controls shall be located so as not to be subject to liquid spills.

5.6.2 Laboratory work areas, laboratory units, and chemical fume hood interiors shall be considered as unclassified electrically with respect to Article 500 of NFPA 70, *National Electrical Code*.

Exception: Under some conditions of hazard, it could be necessary to classify a laboratory work area, or a part thereof, as a hazardous location, for the purpose of designating the electrical installations. [See 10.5.5 (electric motors) and 12.2.2.2 (refrigerators).]

Chapter 6 Fire Protection

6.1 General.

6.1.1 All laboratory units shall be provided with fire protection appropriate to the fire hazard, as follows:

- (1) Portable fire extinguishers (see Section 6.4)
- (2) Fire alarm systems (see Section 6.5)
- (3) Evacuation and emergency plans (see 6.6.3)

6.1.2 In addition to the fire protection specified in 6.1.1, laboratory units under some conditions shall be provided with automatic extinguishing systems (see Section 6.2) and inside standpipe and hose systems (see Section 6.3).

6.2 Automatic Fire Extinguishing Systems.

6.2.1 Automatic Sprinkler Systems.

6.2.1.1 Automatic sprinkler system protection shall be required for all new laboratories in accordance with the following:

- (1) Automatic sprinkler system protection for Class A and Class B laboratories shall be in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*, for ordinary hazard (Group 2) occupancies.
- (2) Automatic sprinkler system protection for Class C and Class D laboratories shall be in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*, for ordinary hazard (Group 1) occupancies.

6.2.1.2 Fire sprinklers in laboratory units shall be the quick-response (QR) sprinkler type installed in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*.

6.2.1.3 Automatic sprinkler systems shall be regularly inspected, tested, and maintained in accordance with NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*.

6.2.2 **Other Automatic Extinguishing Systems.** Where required or used in place of automatic sprinkler systems, special hazard extinguishing systems and nonwater automatic extinguishing systems shall be designed, installed, and maintained in accordance with the following standards, as applicable:

- (1) NFPA 11, *Standard for Low-, Medium-, and High-Expansion Foam*
- (2) NFPA 12, *Standard on Carbon Dioxide Extinguishing Systems*
- (3) NFPA 12A, *Standard on Halon 1301 Fire Extinguishing Systems*
- (4) NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*
- (5) NFPA 17, *Standard for Dry Chemical Extinguishing Systems*
- (6) NFPA 17A, *Standard for Wet Chemical Extinguishing Systems*
- (7) NFPA 69, *Standard on Explosion Prevention Systems*
- (8) NFPA 750, *Standard on Water Mist Fire Protection Systems*
- (9) NFPA 2001, *Standard on Clean Agent Fire Extinguishing Systems*

6.2.3* **Discharge.** The discharge of an automatic fire-extinguishing system shall activate an audible fire alarm system on the premises.

6.3 Standpipe and Hose Systems.

6.3.1* In all laboratory buildings that are two or more stories above or below the grade level (level of exit discharge), standpipes shall be installed in accordance with NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*.

6.3.2 Standpipe systems shall be regularly inspected, tested, and maintained in accordance with NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*.

6.3.3 Hose lines shall be of an approved type and shall be tested and maintained in accordance with NFPA 1962, *Standard for the Inspection, Care, and Use of Fire Hose, Couplings, and Nozzles and the Service Testing of Fire Hose*.

6.4 Portable Fire Extinguishers.

6.4.1 Portable fire extinguishers shall be installed, located, and maintained in accordance with NFPA 10, *Standard for Portable Fire Extinguishers*.

6.4.2 For purposes of sizing and placement of fire extinguishers for Class B fires (see Table 6.3.1.1 of NFPA 10, *Standard for Portable Fire Extinguishers*), Class A laboratory units shall be rated as extra (high) hazard, and Class B, Class C, and Class D laboratory units shall be rated as ordinary (moderate) hazard.

6.5 Fire Alarm Systems.

6.5.1 Fire alarm systems, where provided, shall be installed and maintained in accordance with NFPA 72, *National Fire Alarm and Signaling Code*.

6.5.2 Class A and Class B laboratory units shall have a manual fire alarm system installed and maintained in accordance with NFPA 72, *National Fire Alarm and Signaling Code*.

6.5.3 The fire alarm system, where provided, shall be designed so that all personnel endangered by the fire condition or a contingent condition shall be alerted.

6.5.4 The fire alarm system shall alert local emergency responders or the public fire department.

6.6 Fire Prevention.

6.6.1 Fire Prevention Procedures.

6.6.1.1 Fire prevention procedures shall be established.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information (Check one): Individual Government Entity Company

Name: Robby Dawson Representing: Fire Services Board Code Committee

Mailing Address: _____

Email Address: Dawsonj@chesterfield.gov Telephone Number: 804-717-6838

Proposal Information

Code(s) and Section(s): Table 5003.1.1(1)

Proposed Change (including all relevant section numbers, if multiple sections):

Revise as follows:

Table 5003.1.1(1)
Maximum Allowable Quantity Per Control Area of Hazardous Materials Posing a Physical Hazard

Material	Class	Group When the Maximum Allowable Quantity is Exceeded	Storage			Use-Closed Systems			Use-Open Systems	
			Solid Pounds	Liquid Gallons	Gas Cubic feet At NTP	Solid Pounds	Liquid Gallons	Gas Cubic feet At NTP	Solid Pounds	Liquid gallons
Consumer fireworks	1.4G	H-3	125 ^{d,e,i}	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable

(Deletion of reference to footnote "d" - Remainder of table unchanged.)

Supporting Statement (including intent, need, and cost impact of the proposal):

This is a replication of ICC/IFC Code Change F289-13 that was recommended for approval at the Dallas CAH with a 8-6 committee vote.

In an October 2007 report, the NFPA Standards Council has called into question the appropriateness and reasoning of an increase based on sprinkler protection in the absence of test data justifying the increase. Because of the lack of test data to determine at what level or quantity of consumer fireworks above 125 pounds (500 pounds gross) could or should have the benefit of sprinkler protection, the Standards Council has ordered the issuance of a Tentative Interim Amendment (TIA). This action effectively eliminated the option of an increase for sprinkler protection until such time as acceptable test data is submitted to justify an increase and to what level of increase it could be. Therefore, due to the TIA, the maximum amount of consumer fireworks in the NFPA standard for retail establishments is limited to 125 pounds net (500 pounds gross). In addition, with the TIA the maximum size of consumer firework storage buildings will be limited to 12,000ft² in area. Full background information may be found at the document information tab at www.nfpa.org/1124

For the same reasons, until such time as testing is completed, or if ever completed, this change is to delete the reference to footnote "d" that provided a 100% increase to the amount of consumer fireworks allowed if sprinkler protection is provided, when it has been revealed that the original increase was not based on a credible, verifiable series of tests to determine what the appropriate sprinkler design density should be for what may be typical of the quantities of consumer fireworks present in retail establishments and still not become a Group H-3 building.

Additionally, there is movement in the General Assembly with tentative endorsement of the fire service in Virginia to expand the types of consumer fireworks permitted under Virginia Title 27 which would increase the quantity and types of consumer fireworks available for retail sale in Virginia.

Considering these developments – 1. The national standards organization eliminating sprinkler increases; 2. The national model codes eliminating the sprinkler increases; and 3. The seemingly inevitable expansion of types of consumer fireworks being offered for sale in Virginia, in the absence of the credible evidence these products do not adversely impact the built in fire protection systems in non H use groups, it is wise to adopt the model code in Virginia as soon as possible to ensure the safety of the public.

Submittal Information

Date Submitted: 6/3/2013

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 SBCO (State Building Codes Office)
600 East Main Street
Suite 300
Richmond, VA 23219

Email Address: Vernon.hodge@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7150



VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Ed Altizer

Representing: State Fire Marshal's Office

Mailing Address: 1005 Technology Park Drive, Glen Allen, VA 23059

Email Address: ed.altizer@vdfp.virginia.gov

Telephone Number: 804-371-0220

Proposal Information

Code(s) and Section(s): SFPC 5601.5 through 5601.5.2

Proposed Change (including all relevant section numbers, if multiple sections):

5601.5 Denial, suspension or revocation of a certificate. If issuance or renewal of a Blaster or Pyrotechnician certificate is denied, or upon the filing of a complaint against an applicant or certificate holder for non-performance, or performance in violation of the SFPC and the appropriate referenced NFPA 495, 1123 or 1126 standards, the State Fire Marshal may convene a 3-member panel to hear the particulars of the complaint or denial. The 3-member panel will be comprised of the following persons:

1. A Virginia Certified Fire Official excluding any person certified as a Blaster or Pyrotechnician or is on the staff of the SFMO.
2. A Virginia certified Blaster or Pyrotechnician who's certification is the same as that of the person to whom a complaint is lodged, and who is not associated in any way with the person against whom a complaint is lodged and whose work or employer is geographically remote, as much as practically possible, from the person to whom a complaint is lodged.
3. A member of the general public who does not have a vested financial interest in conducting a fireworks display, or the manufacture, sale, storage or use of explosives.

Upon the State Fire Marshal convening such panel the hearing is to commence within 60 calendar days of the filing of the complaint or denial. The 3-member panel is to hear the complaint and render a written recommendation to the State Fire Marshal for certificate issuance, no action, revocation, or suspension of a certificate for a period not to exceed 6 months.

Notwithstanding the discretionary decision and action to convene such panel, the State Fire Marshal reserves the authority to choose an action that may be contrary to the panel's recommendation. A written decision of the State Fire Marshal is to be delivered to the party within 14 days of the hearing's conclusion. If the certificate is denied, revoked or suspended by the SFMO, in accordance with SFPC Section 112.9 the party may file an appeal with the State Technical Review Board (TRB). The party's appeal to TRB must be filed within 14 calendar days of the receipt of the State Fire Marshal's written decision to deny, revoke, or suspend.

The denial, revocation or suspension of a license is independent of any criminal proceedings that may be initiated by any state or local authority.

5601.5.1 Replacement of revoked certificate. Any person whose certificate as a Pyrotechnician or Blaster was revoked upon cause may apply for certification as a Pyrotechnician or Blaster six months or more from the date of the revocation and upon compliance with Section 5601.4.1. All elements of Section 5601.4.1 are required to be obtained and dated after the date of revocation.

5601.5.2 Return of suspended certificate. Any certificate that was suspended upon cause will be reinstated at the end of the suspension period without change to its expiration date.

Re-number all subsequent sections and tables without any technical changes.

Supporting Statement (including intent, need, and cost impact of the proposal):

This change provides an internal process available at the State Fire Marshal's discretion that's intended to be used as a means to assist or advise the State Fire Marshal in a determination to take no action, or to deny, revoke or suspend a person's certificate based on allegations that the manner in which explosives were manufactured, stored, sold or used, or that a fireworks display was not performed in compliance with the requirements as set forth in the VSFPC and the commensurate referenced standard(s). This is particularly important enough if records or reports of violations were egregious or repeated enough to warrant a necessary action for the continued protection of the public.

The proposed process is not intended to supplant, subvert or avoid criminal proceedings, the issuance of a notice of violation, a summons, or the duty, power or authority of the State Technical Review Board as established and provided for in §§ 36-108 through 36-117 of the Code of Virginia if the State Fire Marshal takes an adverse action against a certificate holder, whether that action is taken with or without the assistance of the convened panel as proposed and a subsequent appeal is filed.

Submittal Information

Date Submitted: 6/3/13 by GAD for SFMO

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 SBCO (State Building Codes Office)
600 East Main Street
Suite 300
Richmond, VA 23219

Email Address: Vernon.hodge@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7150



VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Ed Altizer

Representing: State Fire Marshal's Office

Mailing Address: 1005 Technology Park Drive, Glen Allen, VA 23059

Email Address: ed.altizer@vdfp.virginia.gov

Telephone Number: 804-371-0220

Proposal Information

Code(s) and Section(s): SFPC, Change Section 5603.4

Proposed Change (including all relevant section numbers, if multiple sections):

Change Section 5603.4 to read as follows:

5603.4 Accidents. Accidents involving the use of *explosives, explosive materials* and fireworks, which result in injuries or property damage, shall be immediately reported by the permit holder to the fire code official and State Fire Marshal immediately.

Supporting Statement (including intent, need, and impact of the proposal):

Supported by FSBCC.

With this change the SFMO will be able to accumulate basic information on incidents that produce injuries, deaths or property damage from the use of explosives and fireworks. The accumulated information may produce valuable information on the continued competency of the involved Pyrotechnician, Blaster and/or their employer for the purpose of evaluating and/or recommending suspension, revocation or some other measure of remedial action against the Pyrotechnician, Blaster or the permit holder.

A somewhat similar provision previously existed in the '87, '90 and '93 editions of the SFPC.

Submittal Information

Date Submitted: 6/3/13 by GAD for SFMO

The proposal may be submitted by email as an attachment, by fax, by mail, or by hand delivery.

Please submit the proposal to:

Code Change - F5603.4, SFMO.docx

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information (Check one): Individual Government Entity Company

Name: Robby Dawson Representing: Fire Services Board Code Committee

Mailing Address: _____

Email Address: dawsonj@chesterfield.gov Telephone Number: 804-717-6838

Proposal Information

Code(s) and Section(s): SFPC 5706.6.2.1 and 6111.2.1

Proposed Change (including all relevant section numbers, if multiple sections):

5706.6.2.1 Parking near residential, educational and institutional occupancies and other high-risk areas. Tank vehicles shall not be left unattended at any time on residential streets, or within 500 feet (152 m) of a ~~residential area, apartment or hotel complex, educational facility, hospital or care facility building~~ regularly occupied in whole or in part as a habitation for people, a place of religious worship, schoolhouse, railroad station, store or other structure where people are accustomed to assemble except when parked in accordance with Section 5706.6.2.3. Tank vehicles shall not be left unattended at any other place that would, in the opinion of the fire chief, pose an extreme life hazard.

6111.2.1 Near residential, educational and institutional occupancies and other high-risk areas. LP-gas tank vehicles shall not be left unattended at any time on residential streets or within 500 feet (152 m) of a ~~residential area, apartment or hotel complex, educational facility, hospital or care facility building~~ regularly occupied in whole or in part as a habitation for people, a place of religious worship, schoolhouse, railroad station, store or other structure where people are accustomed to assemble except when parked in accordance with Section 6111.2.2. Tank vehicles shall not be left unattended at any other place that would, in the opinion of the *fire code official*, pose an extreme life hazard.

Supporting Statement (including intent, need, and impact of the proposal):

This is a work in progress. Code change is being submitted to meet the July 1st deadline for submissions and to create an opportunity for further discussions.

Creates uniformity among regulations for hazardous materials separation. The new text is derived from the definition of “inhabited buildings” in chapter 2, which currently applies to explosive materials. The change eliminates the undefined term “residential areas”, which has been a source of confusion particularly in the absence of local zoning regulations or designations.

Submittal Information

Date Submitted: First Draft 6/3/2013

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 SBCO (State Building Codes Office)
600 East Main Street
Suite 300
Richmond, VA 23219

Email Address: Vernon.hodge@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7150



VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2012 Code Change Cycle

Code Change Number: _____

Proponent Information

(Check one): Individual Government Entity Company

Name: Robby Dawson

Representing: Fire Services Board Code Committee

Mailing Address: 1005 Technology Park Drive, Glen Allen, VA 23059

Email Address: dawsonj@chesterfield.gov

Telephone Number: 804-748-1426

Proposal Information

Code(s) and Section(s): SFPC Section 5607.16 and new Table 5607.16

Proposed Change (including all relevant section numbers, if multiple sections):

Change Section 5607.16 to read as follows:

5607.16 Blast records: A record of each blast shall be kept and retained for at least five years and shall be readily available for inspection by the *fire code official*. The record shall ~~contain the following minimum data:~~ be in a format selected by the blaster and shall contain the minimum data and information indicated in Table 5607.16.

- ~~1. Name of contractor;~~
- ~~2. Location and time of blast;~~
- ~~3. Name of certified blaster in charge;~~
- ~~4. Type of material blasted;~~
- ~~5. Number of holes bored and spacing;~~
- ~~6. Diameter and depth of holes;~~
- ~~7. Type and amount of explosives;~~
- ~~8. Amount of explosive per delay of 8 milliseconds or greater;~~
- ~~9. Method of firing and type of circuit;~~
- ~~10. Direction and distance in feet to nearest dwelling, public building, school, church, commercial or institutional building;~~
- ~~11. Weather conditions;~~
- ~~12. Whether or not mats or other precautions were used;~~
- ~~13. Type of detonator and delay period;~~
- ~~14. Type and height of stemming; and~~
- ~~15. Seismograph record when utilized.~~

Exception: Subdivisions 8 and 13 of this section are not applicable to *restricted blasters*.

(See new Table 5607.16 on attached pages.)

Supporting Statement (including intent, need, and impact of the proposal):

This change is to provide guidance and some measure of uniformity of the information gathered and retained. Without such guidance the quality and value of information recorded will vary by location, company, and certified blaster. This information has value when conducting an investigation on a claim of damage, for instance, whether that investigation is conducted by the fire official or an insurance company. At the very least, such comprehensive information has definite value to the blaster themselves.

Four (4) fire officials and nine (9) users of explosives, both large and small blasting contractors, were invited to evaluate the proposed change. Comments and suggestions were seriously considered and incorporated into refining the change. It must be pointed out that the change does not require a blaster to use this particular table or format so long as whatever record format is chosen by the blaster produces the same minimum information. But it is suggested the table be reproduced large enough in the code to fill-in the blanks or spaces in the event a blaster uses the table as printed in the code for their chosen format.

Submittal Information

Date Submitted: 12/7/12

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

**Table 5607.16
Blast (shot) Record**

Block 1				
General Information				
1	Blast date:	Blast No.:	Blast Time:	Permit No.:
2	Blast location by address including city, county or town:			
3	Blast location by GPS coordinates: <input type="checkbox"/> check box if unknown			
4	Name of Permit Holder:			
5	Name of Blaster in charge (print):			
6	Signature of Blaster in charge:			
7	Certification Number of Blaster in charge:			

Block 2			
General environmental conditions			
1	Weather (Clear? Cloudy? Overcast?)	Wind direction and speed @ _____ mph	Temperature F° / C°
2	Topography: (Flat? Hilly? Mountainous?)	Distance from blast site to nearest inhabited building:	Distance from nearest inhabited building determined by: <input type="checkbox"/> GPS coordinates <input type="checkbox"/> Measurement <input type="checkbox"/> Estimated
3	Use of nearest inhabited building? (Dwelling? Business? Apartment Building? School?)	Direction from blast site to nearest inhabited building:	Direction from blast site to nearest inhabited building determined by: <input type="checkbox"/> GPS instrument <input type="checkbox"/> Compass <input type="checkbox"/> Estimated
Additional Blaster notations on environmental conditions:			

Block 3			
Shot layout and precautions taken (N/A = Not Applicable)			
1	No. of holes	Diameter of hole(s)	Depth of hole(s)
2	Were any holes decked? <input type="checkbox"/> Yes <input type="checkbox"/> No	How many holes were decked? <input type="checkbox"/> N/A	How many decks per hole? <input type="checkbox"/> N/A
	(If applicable, indicate on any attached shot pattern drawing which holes were decked and the number of decks for the hole[s].)		
3	Shot pattern <input type="checkbox"/> Check this box if only single hole.	Depth of sub-drilling	Drilling angle
4	Burden	Spacing of holes	Water height
5	Stemming height	Material used for stemming	Check box for flyrock precautions taken <input type="checkbox"/> Mats <input type="checkbox"/> Overburden <input type="checkbox"/> None taken
Additional Blaster notations on shot layout and precautions:			

Block 4			
Seismic control measures (N/A = Not Applicable)			
1	Was Scaled Distance Formula used? <input type="checkbox"/> Yes <input type="checkbox"/> No	Indicate which Scaled Distance equation was used. <input type="checkbox"/> N/A <input type="checkbox"/> $W(lb)=[D(ft)/50]^2$ <input type="checkbox"/> $W(lb)=[D(ft)/55]^2$ <input type="checkbox"/> $W(lb)=[D(ft)/65]^2$	Max. Allow. Chg. Wt. per 8 ms based on Scaled Distance. <input type="checkbox"/> N/A
2	Was seismograph used? <input type="checkbox"/> Yes <input type="checkbox"/> No	Seismograph manufacturer and model number: <input type="checkbox"/> N/A	Seismograph serial number: <input type="checkbox"/> N/A
			Seismograph's last calibration date. <input type="checkbox"/> N/A
3	Distance and direction seismograph from blast site <input type="checkbox"/> N/A	Distance determined by: <input type="checkbox"/> N/A <input type="checkbox"/> GPS coordinates <input type="checkbox"/> Estimated <input type="checkbox"/> Measurement	
4	Seismograph <input type="checkbox"/> N/A Geophone Minimum Frequency _____ Hz Seismograph Microphone Minimum Frequency _____ Hz	Seismograph recordings: <input type="checkbox"/> N/A Transverse _____ in/s _____ Hz Vertical _____ in/s _____ Hz	
5	Seismograph trigger level <input type="checkbox"/> N/A _____ in/s _____ dB	Longitudinal _____ in/s _____ Hz Acoustic _____ dB _____ Hz	
Additional Blaster notations on seismic control measures:			

Block 5				
Quantity and product				
1	Max. Allow. Chg. Wt. per 8 ms Interval _____ lbs <input type="checkbox"/> Delay not used	Initiation (Check) <input type="checkbox"/> Electric <input type="checkbox"/> Non-electric <input type="checkbox"/> Electronic		
2	Max. No. of Holes/Decks per 8 ms interval _____ lbs <input type="checkbox"/> Delay not used			
3	Max. Wt. or sticks of Explosive per hole _____ lbs	Firing device manufacturer and model: <input type="checkbox"/> N/A		
Explosive Product listing (Attach additional pages as needed.)				
4	<u>Manufacturer</u>	<u>Product name, description or brand</u>	<u>Number of units</u>	<u>Unit weight (lb)</u>
5	Total explosive weight in this shot:			lbs.
Additional Blaster notations on product and quantities:				

Block 6	
Completion of shot record and general comments	
General comments on shot not included in notes above:	
Date shot report completed:	Time shot report completed:
Printed name and signature of person completing shot report if different from Block 1, Lines 5 and 6.	(Print)
	(Signature)



Firestone, Janice (DHCD)

Subject: 2012 State fire code suggestion

From: Andrews, William - Fire [<mailto:William.Andrews@richmondgov.com>]

Sent: Friday, May 24, 2013 2:04 PM

To: Davis, Cindy (DHCD)

Cc: Dyer, Earl E. - Fire

Subject: 2012 State fire code suggestion

Thanks for inviting suggestions for improving state fire code. Since Virginia has ICC publish Virginia version of statewide fire code, please consider removing requirements which only are required for new construction under the Virginia statewide building code. Helpful for fire officials to not need to filter which requirements we can apply vs. requirements which only are applicable by building official for new construction. Section 102.6 of the VSFPC limits fire code to not impose requirements that exceed those of the USBC under which the building was constructed. If printed books are too expensive to so modify, please consider edited internet edition, and customers able to buy CD, DVD, or download revised state code.

Examples of fire code sections which should be deleted, due to construction features restricted to authority of building official on new construction:

507.1: The fire official is not authorized to require installation of water supply (permanently plumbed pipes, etc.).

508.1.2: Rating of fire separation of any construction is beyond fire official authority, since such is under building code.

508.1.3: Size of any room is outside fire official authorize, since regulated by building code.

508.1.5: Many features in fire command center are built-in components of systems, which fire officials are not allowed to require, since such systems are under building code.

604.2: Emergency power systems are under building code, thus beyond fire official to require customer to provide. Fire code can only require maintenance and testing of existing systems.

605.11 If referenced conduits, wiring systems and raceways are not portable, such permanently installed systems are under building official instead of fire official. Much of the fire code about placement of equipment is under building code, thus fire official cannot enforce, but merely refer to building official.

606.8: Refrigerant detector are up to building official, since doubt Virginia code intends fire official to require such portable devices in all existing buildings.

606.9 How is fire official suppose to know if remote controls are required, since under Mechanical code, and again section 102.6 would prevent fire official from requiring. Types of switches are not within fire official authority. Emergency pressure control system, crossover valves, and automatic emergency stop feature also beyond fire official authority.

606.12 Physical features of discharge pipes, approved treatment system, flaring system, and construction to meet 606.16 Class I, Division 2 hazardous classifications of NFPA 70 are under building code, beyond fire official to require.

607.1 Fire official cannot require elevators to be provided with recall operation, since such are construction features instead of purely procedural activity.

609.2: Requirement to install type 1 hood under building code, not fire code.

803 & 804: Since interior finishes and trim are part of structure, such under building code instead of fire code (which is limited to freely hung materials, such as curtains).

Chapter 9: Localities coordinate with fire officials about compatible hose threads, but most of chapter 9 are building code requirements, thus suggest remove from Virginia fire code and have in building code.

901.1: Fire code can not specify about fire protection system design nor installation, since such under building code. Fire code covers maintenance, inspection, operation, and testing.

901.4.4: Fire official may not require physical, built-in systems such as automatic alarm nor suppression.

901.5: Fire official is NOT authority having jurisdiction for acceptance of newly installed systems; those are under building, electrical, or mechanical officials.

903: Where sprinklers are required is building code, beyond fire official to require installation.

904: ALL automatic fire-extinguishing systems which are built-in are under building code, thus beyond fire official to apply.

905: Standpipe system are under building code, beyond fire official authority to require.

907: New or old buildings, installation of fire alarms are under building code. *PLEASE have codes allow fire officials to require single station battery smoke detectors in residences built prior to building code requiring such. Since devices can be hung as simply as hanging a picture or ceiling hook for plants or drapes, single station battery-only smoke detectors should not be restricted to building official, but also allow fire official to require, especially in older rental residences.*

907.2.11.3 *Please allow exception for older existing dwellings to not need interconnected smoke detectors. Single station smoke detectors should be minimum for residences built prior to code requiring smoke detectors.*

Chapter 10: Most of Means of Egress chapter specifies construction, thus beyond fire official authority. Size of doors, number and placement of exits, etc. are construction, thus building code instead of fire code details.

1003.2: Fire official is unable to increase ceiling height where as built and allowed by building code.

1003.5: Floor slope is beyond fire official to change such construction.

1004: The occupant load is determined by the building official. Fire official has responsibility to preventing activity from exceeding capacity established by building official.

While information is helpful, code should clarify that capacities are set by building code.

1007.6.3: Built-in communication systems are building code features. I doubt code designers intend for such systems to be portable, which could be fire official jurisdiction to require installing.

1008: Size of doors, swing direction, landing width, space between doors, and hardware are construction, thus under building code instead of fire official ability to enforce installation. Helpful if fire code clearly states keeping egress easy to escape.

1009: Stairways are constructed per building code, thus fire official cannot require built feature differently (enclosed or open). Stair riser height and tread depth are as built, per building code; beyond fire official authority to change.

1010: Construction feature of ramps are building code details, thus what's in fire code should be limited to informational and maintenance (since fire official is not legally able to enforce changing construction).

1012 & 1013: Handrails' & Guards' physical features are under building code for dimensions, then fire official job to mandate maintenance.

1014: While exit access is good for fire official to discuss with customer for evacuation procedures, the construction of such is under building code.

1015 & 1016: Number and arrangement of exits (including travel distance) are under building code; as is establishing occupancy loads.

1018: Dead end constructed corridors are under building code; beyond fire official authority to shorten distance nor require installing additional exit.

1021: Number of exits and exit configuration is as constructed under building code, thus beyond fire official to change.

1024: Since attached to building, does Virginia authorize fire officials to require luminous egress path marking in new or existing high-rises? If code only for new construction, then this should be for building official to enforce instead of fire official (which usually is limited to maintenance requirement).

1026 & 1027: Up to building code if any exit or stairway is a required means of egress, and exterior ground grading. Fire official may help customer with evacuation process, but physical features, arrangements and construction of egress components are under building code official.

1028.6.2.1: Smoke control systems are typically "as built" features, thus more under building code, since Virginia limits fire code to mostly maintenance and procedural activities.

1028.6.2.3: Fire official cannot require sprinkler installation, merely maintenance, inspection & tests.

1028: Fixed-seating situations (including floor steps or slope, and handrails) are more under building official, while portable chairs & tables are fire official job to enforce adequate egress.

1029: Window sizes & permanently affixed ladders are under building code, beyond fire official to change construction.

2108.2: Fire official cannot require installation of sprinklers, for dry-cleaning nor any use or reason. Such construction is solely under building code.

2303, 2306.7, 2307.4, 2308.3, & 2309.3 : Fuel dispensing pumps are installed per mechanical, plumbing, and building codes; beyond authority of fire official to specify construction location, nor installation of switches. Fire official can regulate portable containers, but not construction of fixed systems, which are under building code.

2311.2.3: Fire official cannot require existing floor drains in garages to change construction so will go to oil separator or trap. Building and environmental codes address such construction features for new vs. old buildings. Fire official can regulate customer's procedures for proper disposal.

2404.4: Fire official cannot require automatic fire-extinguishing system; since code notes exhaust ducts, etc., such spray booths should be considered as requiring building & mechanical permits, thus installation details under those codes. Fire code regulates activities.

3103.8.2 Since tents or membrane structures are constructed via building permit, distances from fixed points (lot line or building) should be building code; while fire code can address distance to mobile concerns, such as portable heaters or generators, vehicles, open flames, etc..

3103.12.2: Similar to buildings, details on exits in tents and membrane structures should be building code issue; not for fire official to require changes in construction.

5003.8.4 Construction features of gas rooms are building code requirement, while fire official regulates portable gear and procedures.

5704.2.8.9: IF vaults are permanently installed, connected electrically by electrical permit instead of stand-alone units which plug into an electrical outlet, then ventilation and detection systems should come under building, electrical, and mechanical codes, with fire code focusing of maintenance, testing, and operational concerns.

5704.2.10: Since area surrounding fixed tanks are "built", physical features of ground or barriers should be regulated by building code, with fire code addressing maintenance and operational activities.

Good if building & mechanical official were required to inform fire official when storage tanks are installed, so firefighting crews aware, and records for fire code permits.

5704.3.8.4: Fire official cannot require sprinkler system; that is building code. 5704.3.8.5: Hard rubber hand hoses don't help where no standpipe, which is beyond fire official authority to require (that is building code issue).

5705.3.7.3: Fire official cannot require automatic fire-extinguishing system, however room or building is classified by IBC; since such is building code regulated.

The 2012 IFC has re-organized, leaving many chapters reserved for future. Maybe Virginia will also consider keeping chapters in sequence, and encouraging ICC to revert back for 2015 edition. Instead of code having up to a chapter 65, seems awkward when only 39 actual chapters (Virginia version merely 38 since state deletes chapter on existing buildings, under construction or renovations).

Sincerely,

William Andrews, City of Richmond, Fire Prevention, desk phone 646-0621, e-mail:
William.Andrews@RichmondGov.com
201 E. Franklin St., Richmond, VA 23219

SWCB REGULATIONS ON TANKS

The USBC section on flammable and combustible liquids indicates that regulations governing the installation, repair, upgrade, and closure of underground and aboveground storage tanks under the Virginia State Water Control Board (SWCB) regulation(s) 9 VAC 25-580-10 et seq. and 9 VAC 25-91-10 et seq. are adopted and incorporated by reference to be an enforceable part of this code.

The purpose of these charts is for quick reference to determine when and how tanks are regulated by these SWCB regulations. Tanks exempt or excluded by SWCB regulations are not exempt from meeting USBC requirements.

CHART A - UNDERGROUND STORAGE TANKS (USTs)

A UST within any of the categories marked "YES" indicates that the SWCB regulations (<http://www.deq.state.va.us/tanks/dwnllib.html#tankregs>) contain requirements that the UST must comply with. Regulations do not apply to underground storage tanks that are not part of the definition^a, or are excluded^b by the regulations. In certain instances UST's may be partially regulated.^{c,d} The SWCB regulations define an UST as any one or a combination of tanks (including underground pipes) that is used to contain an accumulation of regulated substances and the volume of which (including underground pipes) is 10% or more below the surface of the ground.

BRIEF DESCRIPTION	UST REG APPLY
UST Technical Regulations (9 VAC 25-580-10 et seq.) address "regulated substances" that is defined in Article 9 of the State Water Control Law to mean any one of the following: ^e a.) Any substance listed in §101(14) of CERCLA (42 USC § 9601 <i>et seq.</i>) Available on the Web at: http://www.epa.gov/swrust1/fedlaws/cfr.htm#40cfr302.4 ; b.) Petroleum, including crude oil or any fraction thereof, that is liquid at standard conditions of temperature and pressure (60°F and 14.7 psia); or c.) Petroleum-based substances comprised of a complex blend of hydrocarbons derived from crude oil through a process of separation, conversion, upgrading, and finishing, such as motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.	YES
Any UST ≤ 110 gallons	NO
Farm or residential tank ≤ 1,100 gallons used for storing <i>motor fuel</i> for noncommercial purposes	NO
All underground tanks used for storing <i>heating oil</i> for consumption on the premises where stored	NO

- a. Farm or residential tanks of 1,100 gallons or less capacity used for storing motor fuel for noncommercial purposes; Tanks used for storing heating oil for consumption on the premises where stored; Septic tanks; Pipeline facilities regulated under the Natural Gas Pipeline Safety Act of 1968, the Hazardous Liquid Pipeline Safety Act of 1979, or an intrastate pipeline; Surface impoundment, pit, pond, or lagoon; Storm water or wastewater collection systems; Flow-through process tanks; Liquid trap or associated gathering lines directly related to oil or gas production and gathering operations; Storage tank situated in an underground area (such as a basement, cellar, mine-working, drift, shaft, or tunnel) if the storage tank is situated upon or above the surface of the floor is regulated as an AST; Pipes connected to any of these tanks.
- b. UST systems holding hazardous wastes listed or identified under Subtitle C of the Solid Waste Disposal Act, or a mixture of such hazardous waste and other regulated substances; Wastewater treatment tank system that is part of a wastewater treatment facility regulated under §402 or §307(b) of the Clean Water Act; Equipment of machinery that contains regulated substances for operational purposes such as hydraulic lift tanks and electrical equipment tanks; Any UST system whose capacity is 110 gallons or less; UST systems containing de minimis concentration of regulated substances; Emergency spill or overflow containment UST system that is expeditiously emptied after use.
- c. Wastewater treatment tank systems; UST systems containing radioactive material that are regulated under the Atomic Energy Act of 1954; UST systems that are part of an emergency generator system at nuclear power generation facilities regulated by the Nuclear Regulatory Commission under 10 CFR 50, Appendix A; Airport hydrant fuel distribution systems; UST systems with field-constructed tanks.
- d. Release detection does not apply to any UST system that stores fuel solely for use by emergency power generators.
- e. Wording has been abbreviated. For complete definition see "regulated substance" in 9 VAC 25-580-10.

§ 32.1-165. Prior approval required before issuance of building permit.

No county, city, town or employee thereof shall issue a permit for a building designed for human occupancy without the prior written authorization of the Commissioner or his agent. The Commissioner or his agent shall authorize the issuance of such permit upon his finding that safe, adequate and proper sewage treatment is or will be made available to such building, or upon finding that the issuance of said permit has been approved by the Review Board.

(Code 1950, § 32-9; 1954, c. 646; 1964, c. 436; 1970, c. 645; 1972, c. 775; 1979, c. 711; 1984, c. 457.)

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VIRGINIA BOILER AND PRESSURE VESSEL GUIDE*
2009 USBC Section 2801.1

OBJECT	APPLICATION	EXEMPTION
Boiler	Residence	All
Boiler	Apartment Building	Less than 4 units
Boiler	Heating/Process	None
Boiler	Hot Water Supply	Less than 120 gal./ 200,000 BTU/hr input
Water Heater	Hot Water Supply	Less than 120 gal./ 200,000 BTU/hr input
Pressure Vessel	Storage, Air	Less than 8 ft. ³ (60 gal.)/ 175 psi set pressure
Pressure Vessel	Potable Water	No steam coil/ Less than 300 psi
Pressure Vessel	Air & Water	Less than 120 gal.
Pressure Vessel	AC/Refrigeration	Less than 5ft. ³ /250 psi

* See Exemptions listed in § 40.1-51.8 of the Code of Virginia for the specific wording.

MEMORANDUM OF AGREEMENT
between the Board of Housing and Community Development
and the Virginia Department of Labor and Industry

(Revised May, 2013)

In accordance with Sections 36-98 et seq. and 40.1-51.6 et seq. of the Code of Virginia, the Virginia Department at Labor and industry (hereinafter referred to as the "Department") and the Board of Housing and Community Development (hereinafter referred to as the "Board") on this _____, 2013 agree to coordinate the Virginia Uniform Statewide Building Code (hereinafter referred to as the "Code") and the Boiler and Pressure Vessel Safety Regulations (hereinafter referred to as the "Regulations"). The parties agree to the following:

1. That enforcement of the Code is the responsibility of the local building department, and that enforcement of the Regulations is the responsibility of the Department.
2. That this agreement covers boilers and water heaters except:
 - A Boilers used in private residences or apartment houses of less than four apartments.
 - B. Hot water supply boilers and water heaters when the following limitations are not exceeded:
 - a) heat input of 200,000 BTU per hour
 - b) water temperature of 210 Fahrenheit
 - c) water-containing capacity of 120 gallons
3. That the local building department shall notify, in writing, the chief boiler inspector when a building, mechanical or plumbing permit is issued for any boiler or water heater that is subject to the Department's inspection. The local building department may provide computer generated disks in e-mail attachments listing owners/users addresses of boilers and water heaters.
4. That inspection and certification of boilers shall be the responsibility of the Department; however, the Department may authorize and accept inspection reports from approved special inspectors and owner-user inspection agencies in accordance with sections 40.1-51.9 and 40.1-51.11:1 of the Code of Virginia.
5. That the Department shall assure new and existing boilers and water heaters are in compliance with the Regulations.

MEMORANDUM OF AGREEMENT
PAGE 2 OF 2

6. That the local building department shall accept the inspection certificate of compliance from the Department as evidence of compliance with the Regulations. The Department shall notify, in writing, the local building department of the issuance of certificate of compliance.
7. That appropriate amendments, additions, or deletions will be made to the Regulation and to the Code to insure that there is no jurisdictional conflict between the two documents.
8. That it is the intention of both the Board and the Department to cooperate with each other in resolving any technical conflicts between the Regulations and the Code, and in developing and implementing operational procedures to insure and promote a constructive working relationship between building officials and boiler inspectors.
9. That, except in matters of imminent danger to public health or safety, whenever conflicts or disagreements arise between the two agencies or their staffs or localities, all appropriate regulatory procedures will be exhausted prior to any judicial action. That the local building official may require appropriate corrective actions in accordance with the Code, where unsafe conditions exist and there is an imminent danger to the public health or safety.
10. That this Agreement may be amended or terminated by mutual consent of the parties.

The undersigned agree to the conditions of the Agreement,

William C. Shelton
Director, Department of Housing
and Community Development

Courtney M. Malveaux
Commissioner, Department of Labor
and Industry

This document replaces charts A, B and C previously used in the March 2011 Virginia Building & Fire Code Related Laws package for quick reference to determine, in accordance with §54.1-402 of the *Code of Virginia*, if an A or E seal is required on documents for proposed construction.

Single-Family Homes, Two-Family Homes, Townhouses, Multi-Family Dwellings

- A/E license is not required for structures with three stories or less.
- A/E license is required for all electrical or mechanical systems regardless of the number of stories within the structure.

Farm Structures

- A/E license is not required for structures used primarily in the production, handling or storage of agricultural products or implements including, but not limited to, structures used for the handling, processing, housing or storage of crops, feeds, supplies, equipment, animals or poultry.

Business (Use Group B) and Mercantile (Use Group M) Buildings and Structures and Churches with an Occupant Load of 100 or Less

- A/E license is not required for buildings/structures where the total net floor area is $\leq 5,000$ square feet and the building/structure does not exceed three stories.
- A/E license is required for all electrical or mechanical systems regardless of the number of stories or square footage within the building/structure.

Factory and Industrial (Use Group F) and Storage (Use Group S) Buildings/Structures

- A/E license is not required for buildings/structures where the total net floor area is $\leq 15,000$ square feet and the building/structure does not exceed three stories.
- A/E license is required for all electrical or mechanical systems regardless of the number of stories or square footage within the building/structure.

Additions, Remodels, and Interior Design

- A/E license is not required as long as there is no (all apply):
 - Change in occupancy or occupancy load;
 - Modification to the structural system;
 - Change in access or exit patterns; or
 - Increase in fire hazard.

Electric Installations

- A/E license is not required as long as (all apply):
 - The installation complies with all applicable codes;
 - The installation does not exceed 600 volts and 800 amps;
 - The work is designed and performed under the direct supervision of a person licensed as a master's level electrician or Class A electrical contractor by written examination;
 - The installation is not contained in any structure exceeding three stories;
 - The installation is not contained in a Use Group A-1 theater which exceeds assembly of 100 persons;
 - The installation is not contained in Use Group A-4 structures*;
 - The installation is not contained in Use Group I institutional buildings*

Plumbing and Mechanical Systems

- A/E license is not required for plumbing systems as long as (all apply):
 - The system uses packaged equipment of catalogued standard design which has been coordinated and tested by the manufacturer;
 - The equipment complies with all applicable codes;
 - The work is designed and performed under the direct supervision of a person licensed as a master's level plumber or Class A contractor by written examination in the plumbing specialty;
 - The installation is not contained in any structure exceeding three stories;
 - The installation is not contained in a Use Group A-1 theater which exceeds assembly of 100 persons;
 - The installation is not contained in Use Group A-4 structures*;
 - The installation is not contained in Use Group I institutional buildings.*
- A/E license is not required for mechanical systems as long as (all apply):
 - The system uses packaged equipment of catalogued standard design which has been coordinated and tested by the manufacturer;
 - The equipment complies with all applicable codes;
 - Other than refrigeration, the gauge pressures do not exceed 125 pounds per square inch;
 - Other than flue gas, temperatures do not exceed 300° F (150° C);
 - The work is designed and performed under the direct supervision of a person licensed as a master's level heating, air conditioning, and ventilating (HVAC) worker, or Class A contractor by written examination in the HVAC specialty;
 - The installation is not contained in any structure exceeding three stories;
 - The installation is not contained in a Use Group A-1 theater which exceeds assembly of 100 persons;
 - The installation is not contained in Use Group A-4 structures*;
 - The installation is not contained in Use Group I institutional buildings*

Shop Drawings, Field Drawings, and Specifications for Components by a Contractor

- A/E license is not required for a contractor who prepares shop drawings, field drawings, and specifications for components as long as the contractor supervises the installation and the shop

drawings and specifications will be reviewed by the licensed professional engineer or architect responsible for the project.

Buildings/Structures, Electrical Installations, and Mechanical Installations not Exempted Above

- Buildings, structures, or electrical and mechanical installations, not specified as exempt above, do not require an A/E license as long as (all apply):
 - The building, structure, electrical installation, or mechanical installation is of standard design;
 - The building, structure, electrical installation, or mechanical installation bears the certification of a professional engineer or architect registered or licensed in another state;
 - The building, structure, electrical installation, or mechanical installation design is adapted for the specific location and for conformity with local codes, ordinances and regulations; and
 - It is certified by a professional engineer or architect licensed in Virginia.

* A/E license is not required for churches, day care nurseries, or clinics (without life-support) provided all other conditions are satisfied.

A/E SEAL ON DRAWING

The purpose of these charts and notes is for quick reference to determine in accordance with § 54.1-402 of the Code of Vir-

ginia if an architect's or engineer's (A/E) seal is required on documents for proposed construction.

CHART A - GENERAL DESIGN

A proposed structure which is classified within any of the categories marked "Yes" requires an A/E seal on the documents. Separate requirements apply as to when the electrical, plumbing or mechanical systems in such structures require an A/E seal (see Charts B and C).

GROUP	BRIEF DESCRIPTION	AREA (SQ. FT.)			HEIGHT (STORIES)	
		5,000 OR LESS	5,001 TO 15,000	OVER 15,000	3 OR LESS	OVER 3
A ¹	ASSEMBLY	YES	YES	YES	YES	YES
B	BUSINESS	—	YES	YES	—	YES
E	SCHOOLS & DAY CARE CENTERS	YES	YES	YES	YES	YES
F	FACTORY & INDUSTRIAL	—	—	YES	—	YES
H	HIGH HAZARD	YES	YES	YES	YES	YES
I	INSTITUTIONAL	YES	YES	YES	YES	YES
M	MERCANTILE	—	YES	YES	—	YES
R-1	HOTEL, MOTEL & DORMITORY	YES	YES	YES	YES	YES
R-2 ⁷	MULTI-FAMILY RESIDENTIAL	—	—	—	YES	YES
R-3	2 FAMILY ATTACHED	—	—	—	—	YES
R-4	RESIDENTIAL ASSISTED LIVING	—	—	YES	—	YES
R-5	1 & 2 FAMILY DWELLINGS	—	—	—	—	YES
S	STORAGE (NON-FARM)	—	—	YES	—	YES
U	UTILITY & MISCELLANEOUS	—	—	YES	—	YES
ALL	INTERIOR DESIGN	SEE NOTE NUMBER 4				

Notes: (Apply the following notes to all categories as applicable.)

1. Churches are exempt if building does not exceed 5,000 square feet or three stories, and the occupant load does not exceed 100.
2. A local building code official may require an A/E seal even if not required to do so by this chart.
3. The law requires that, where an A/E seal is not present, the plans must be signed by the individual (not company) responsible for the design, including the individual's occupation and address.
4. Additions, remodeling or interior design defined under § 54.1-400 of the Code of Virginia might not require an A/E seal. For construction, additions or remodeling resulting in a change in occupancy, occupancy load, modification to the structural system, change in access or egress or an increase in fire hazard an A/E seal is required in accordance with § 54.1-400, although notes 1 and 2 still apply.
5. Any unique design of structural elements for floors, walls, roofs or foundations requires an A/E seal, regardless of whether or not the remainder of the plans require such certification.
6. Buildings, structures, or electrical and mechanical installations which are not otherwise exempted but which are of standard design, provided they bear the certification of a professional engineer or architect registered or licensed in another state, and provided that the design is adapted for the specific location and conformity with local codes, ordinances and regulations, and is so certified by a professional engineer or architect licensed in Virginia may not require an A/E seal.
7. One exit and three stories or less Group R-2 buildings would normally be exempted from an A/E seal except where required by Note 2. Most all other three stories or less Group R-2 multi-family buildings are required by the building officials to have A/E seals for the construction documents.

BUILDING AND FIRE CODE RELATED LAWS

CHART B - ELECTRICAL DESIGN (cont.)

A proposed electrical system which is classified within any of the categories marked "Yes" requires an A/E seal on the construction documents. Those NOT marked "Yes" may not require an A/E seal only if designed by a licensed master electrician or Class A electrical contractor (see Notes 2 and 3). Separate requirements apply as to whether the mechanical systems or the general design of such structures require an A/E seal (see Charts A and C).

GROUP	BRIEF DESCRIPTION	HEIGHT (STORIES)		OCCUPANT LOAD		VOLTS		AMPS	
		3 OR LESS	OVER 3	100 OR LESS	OVER 100	600 OR LESS	OVER 600	800 OR LESS	OVER 800
A-1	THEATERS	—	YES	—	YES	—	YES	—	YES
A-2	RESTAURANTS, NIGHTCLUBS	—	YES	—	—	—	YES	—	YES
A-3	DANCE HALLS, CHURCHES	—	YES	—	—	—	YES	—	YES
A-5	GRANDSTANDS, ETC.	—	YES	—	—	—	YES	—	YES
B	BUSINESS	—	YES	—	—	—	YES	—	YES
E	SCHOOLS	YES	YES	YES	YES	YES	YES	YES	YES
F	FACTORY & INDUSTRIAL	—	YES	—	—	—	YES	—	YES
H	HIGH HAZARD	YES	YES	YES	YES	YES	YES	YES	YES
I	INSTITUTIONAL (I-1, I-2 & I-3)	YES	YES	YES	YES	YES	YES	YES	YES
I-4	DAY CARE/NURSERIES	—	YES	—	YES	—	YES	—	YES
M	MERCANTILE	—	YES	—	—	—	YES	—	YES
R	RESIDENTIAL	—	YES	—	YES	—	YES	—	YES
S	STORAGE	—	YES	—	—	—	YES	—	YES
U	UTILITY & MISCELLANEOUS	—	YES	—	—	—	YES	—	YES

Notes: (Apply the following notes to all categories as applicable.)

1. A local building official may require an A/E seal for electrical work even if not required to do so by this chart.
2. The law requires that, where an A/E seal is not present, the plans must be signed by the individual (not company) responsible for the design, including the individual's occupation and address.
3. The above chart applies both to new construction and to additions or remodeling.
4. The exemption for electrical contractors and electricians is applicable only when both design and installation are under their direction or control.

CHART C - PLUMBING AND MECHANICAL DESIGN (cont.)

A proposed plumbing or mechanical system which is classified within any of the categories marked "Yes" requires an A/E seal on the construction documents. Those NOT marked "Yes" may not require an A/E seal only if designed by a person licensed as a master plumber, master mechanical worker, or Class A contractor in those specialties by written examination (see Notes 3 and 5). Separate requirements apply as to whether the electrical system or the general design of such structures requires an A/E seal (see Charts A and B).

GROUP	BRIEF DESCRIPTION	HEIGHT (STORIES)		OCCUPANT LOAD		THRESHOLD LEVEL ¹	
		3 OR LESS	OVER 3	100 OR LESS	OVER 100	BELOW	ABOVE
A-1	THEATERS	—	YES	—	YES	—	YES
A-2	RESTAURANTS, NIGHTCLUBS	—	YES	—	—	—	YES
A-3	DANCE HALLS, CHURCHES	—	YES	—	—	—	YES
A-5	GRANDSTANDS, ETC.	—	YES	—	—	—	YES
B	BUSINESS	—	YES	—	—	—	YES
E	SCHOOLS	YES	YES	YES	YES	YES	YES
F	FACTORY & INDUSTRIAL	—	YES	—	—	—	YES
H	HIGH HAZARD	YES	YES	YES	YES	YES	YES
I	INSTITUTIONAL (I-1, I-2 & I-3)	YES	YES	YES	YES	YES	YES
I-4	DAY CARE	—	YES	—	YES	—	YES
M	MERCANTILE	—	YES	—	—	—	YES
R	RESIDENTIAL	—	YES	—	YES	—	YES
S	STORAGE	—	YES	—	—	—	YES
U	UTILITY & MISCELLANEOUS	—	YES	—	—	—	YES

Notes: (Apply the following notes to all categories as applicable.)

1. The "Threshold Level" is defined in the law as "Plumbing and mechanical systems using packaged mechanical equipment, such as equipment of cataloged standard design which has been coordinated and tested by the manufacturer, which comply with all applicable codes. These mechanical systems shall not exceed gauge pressures of 125 pounds per square inch, other than refrigeration, or temperatures other than flue gas of 300°F (150°C) ..."
2. A local building official may require an A/E seal for plumbing and mechanical systems even if not required to do so by this chart.
3. The law requires that, where an A/E seal is not present, the plans must be signed by the individual (not company) responsible for the design, including the individual's occupation and address.
4. The above chart applies to both new construction and to additions or remodeling.
5. The exemptions for plumbers, HVAC workers, and mechanical contractors are applicable only when both design and installation are under his/her direction or control.