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Sprinkler Protection of Crawl Spaces

An issue recently surfaced in Canada on the subject of when “crawl spaces” are required to be sprinklered in accordance with NFPA 13. According to the Canadian Automatic Sprinkler Association, the general consensus throughout the fire sprinkler industry as well as the architectural/engineering community has been to treat these areas as concealed spaces. When of non-combustible construction or when of combustible construction with limited access, the trend has been to omit sprinklers. A crawl space was suggested to be any space less than 1.8 m (6 ft) in height. However, variations are starting to appear. Lacking specific guidance from NFPA 13, some cities are starting to require sprinklers, while others are citing the exemption that appears in Section 6.9.6 of NFPA 13R.

There may be some difference in the American and Canadian use of the term “crawl space,” just as there are differences between the common definition and the construction definition. Most dictionaries define “crawl space” as a “shallow unfinished space beneath the first floor or under the roof of a building, especially for access to plumbing or wiring.” Construction dictionaries, however, tend to limit the use of the term to the space between the first floor and the ground for a building with no basement. Any space below the roof would qualify instead as an attic. Similarly, NFPA 13 would treat the spaces differently depending on whether they were under the roof or under the first floor.

If under the roof, and of noncombustible and limited combustible construction, sprinklers can only be omitted if the space has no access or only limited access, such that it cannot be used for occupancy or storage. These conditions are addressed in Sections 8.15.1.2.1 and 8.15.1.2.2.

If the space has no access or only limited access such that it cannot be used for occupancy or storage, but is enclosed wholly or partly by exposed combustible construction, it is required to be sprinklered, unless it falls under one of the fourteen subsections now labeled as 8.15.1.2.3 through 8.15.1.2.16. The minimum clear space below which it is considered impractical to provide sprinkler protection is a depth of 6 inches (152 mm), as demonstrated by the wording of subsections 8.15.2.3, 8.15.2.4, and 8.15.2.5. Section 8.15.1.5 allows the use of partial protection where combustibles are localized, and the two subsequent sections spell out special rules for sprinkler protection of flat shallow combustible concealed spaces.

The NFSA actually had to defend the impracticality aspect of spaces less than 6 inches in depth during the adoption of the 1985 edition of NFPA 13. At the Fall Meeting of the NFPA in San Diego in November of 1984, NFSA successfully argued from the floor for the allowance of what is currently Section 8.15.1.2.5, where the ceiling is within 6 inches of the underside of wood joist construction. The Committee had agreed with the NFSA that it was impractical to install sprinklers in a shallower space, but the Water Extinguishing Systems Correlating Committee had declared the subject new business and held it for further study. The floor action supported the NFSA and overturned the Correlating Committee.

During the floor debate, a prominent fire protection engineer testified that, in his summer job as a fitter during college, he had often installed sprinklers in combustible concealed spaces less than 6 inches in depth. This prompted one sprinkler contractor to suggest “he must have been a lot thinner back then.”

Section 8.15.6 of NFPA 13 separately addresses “Spaces Under Ground Floors, Exterior Docks, and Platforms.” Subsection 8.15.6.2 allows omission of sprinklers when all of the following conditions prevail:

- (1) The space is not accessible for storage purposes and is protected against accumulation of wind-borne debris.
- (2) The space contains no equipment such as conveyors or fuel-fired heating units.
- (3) The floor over the space is of tight construction.
- (4) No combustible or flammable liquids or materials that under fire conditions would convert into combustible or flammable liquids are processed, handled, or stored on the floor above the space.

Otherwise, sprinklers are required in the below-floor space. The depth of the space is not a consideration.

The wording of this section dates back to the 1940 edition of what was then NBFU 13 – *The Installation of Sprinkler Equipments* with very little change. The section dealing with the attic spaces, however, has been subject to many amendments over the years. In the 1940 edition the subject was addressed by only this simple requirement:

“714. Blind Spaces. Sprinklers should be installed in all blind spaces enclosed by combustible construction, as in walls, floors and ceilings, except where there is less than 6 inches clearance between opposite sides of the space. The clearance shall be measured from the inside edges of studs or joists, which form the opposite sides of the space.”

The prior edition of the sprinkler standard, published in 1936, was actually more restrictive: “All combustible blind spaces in floors or ceilings shall be provided with sprinkler protection up to the point where a 4-inch clearance prevails between upper and lower joists.”

New 50% Discount “Business Thursday” ITM Series Starts This Week

As previously announced, the NFSA is coordinating its “Technical Tuesday” and “Business Thursday” seminars for the second half of 2009 to promote comprehensive training in the area of Inspection, Testing and Maintenance, helping individuals train for the work elements in the NICET Inspection and Testing certification program. Ten “Technical Tuesday” online training programs will be offered along with six “Business Thursday” online seminars. The seminars start at 10:30 am Eastern time (7:30 am Pacific time) and run from 60 minutes to 90 minutes in length, allowing participants to ask questions via e-mail. The seminars are priced at \$125 each for NFSA members. While the usual 30 percent discount will be available for the package of ten “Technical Tuesday” seminars, and a similar 30 percent discount will be available for the package of six “Business Thursday seminars”, the NFSA is also offering an unprecedented 50 percent discount for the six Business Thursday seminars to any anyone who signs up for the ten Technical Tuesday seminars. That’s a total of only \$1250 for members for all 16 seminars, or about \$78 each. Fees are per connection, so it doesn’t matter how many students are actually sitting in at a location. The two seminar series dovetail to allow a comprehensive review of both technical and nontechnical topics in the same overall subject area, aimed at NICET Inspection and Testing certification.

NOTE: Although field personnel that might benefit from the training might not be available during hours of the original presentations, NFSA members are reminded that the seminars are accessible online for at least 24 hours following their original broadcast. Perhaps you should consider scheduling Wednesday/Friday training sessions for your personnel at your own company's convenience.

Upcoming "Business Thursday" Online Seminar – July 30th

Topic: Business and Professional Communications
Instructor: Russell P. Fleming, P.E., NFSA Executive Vice President
Date: July 30, 2009

The ability to write clear sentences and paragraphs is considered essential to everyone working in the business world today. Use of proper punctuation, vocabulary, spelling and sentence structure is important for company image, which contributes to company success. This seminar will present the basics of proper written communication and will include a look at the most common mistakes, some involving terminology specific to the fire sprinkler industry. (Great study guide for NICET Work Elements 41012 and 45008)

Upcoming "Technical Tuesday" Online Seminar – August 4th

Topic: Inspection and Testing of Wet Pipe Sprinkler Systems
Instructor: Jeff Hugo, CBO, NFSA Manager of Codes
Date: August 4, 2009

Inspecting and testing wet pipe sprinkler systems and components common to all systems like check valves, control valves and fire department connections will be covered in this seminar. The inspection and testing rules of NFPA 25 will be covered along with identification of basic components and their locations as required by NFPA 13. (Great study guide for NICET Work Elements 43002 and 43007)

To register or for more information, contact Dawn Fitzmaurice at (845) 878-4207.

Additional training opportunities available through the NFSA engineering department include...

Two-Week Layout Technician Training

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| September 14-25, 2009 | Baltimore, MD |
| October 12-23, 2009 | Phoenix, AZ |

Inspection and Testing for the Sprinkler Industry

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| August 4-6 (rescheduled from June 16-18) | Leominster, MA |
| August 18-20, 2009 | Wilmington, DE |

For more information on the above classes, contact Nicole Sprague using Sprague@nfsa.org or by calling 845-878-4200 ext. 149.

In-Class Training Seminars

The NFSA training department also offers in-class training on a variety of subjects at locations across the country. Here are some upcoming seminars:

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| Inspection, Testing & Maintenance | Apple Valley, CA | July 29 |
| Sprinkler Protection for Rack Storage | Apple Valley, CA | July 30 |
| Inspection, Testing & Maintenance | Lake Jackson, TX | Aug 4 |
| Hydraulics for Fire Protection | Lake Jackson, TX | Aug 5 |
| Residential Sprinklers: Homes to High Rise | Rogers, AR | Aug 11 |
| Sprinklers for Dwellings | Rogers, AR | Aug 12 |
| Sprinkler Prot. for Flam. & Comb. Liquid Storage (1/2 Day) | Rogers, AR | Aug 13 |
| CPVC Piping (1/2 Day) | Rogers, AR | Aug 13 |
| NFPA 13 Overview | Kahului, HI | Aug 12-23 |
| Inspection, Testing & Maintenance | Kahului, HI | Aug 14 |
| NFPA 13 Overview | Brighton, MI | Aug 19-20 |
| Sprinklers for Dwellings | Brighton, MI | Aug 21 |
| NFPA 13 Update 2007 | Aurora, IL | Aug 26 |
| NFPA 13 Overview | Aurora, IL | Aug 27-28 |
| NFPA 13 2007 Update | Boardman, OR | Sept 1 |
| Hydraulics for Fire Protection | Boardman, OR | Sept 2 |
| Inspection, Testing & Maintenance | Boardman, OR | Sept 3 |
| Introduction to Sprinkler Systems (1/2 Day AM) | Alexandria, MN | Sept 8 |
| NFPA 13 2002 Update (1/2 Day PM) | Alexandria, MN | Sept 8 |
| Plan Review Policies & Procedures | Alexandria, MN | Sept 9 |
| Inspection, Testing & Maintenance | Alexandria, MN | Sept 10 |
| Commissioning & Acceptance Testing (1/2 Day) | Seattle, WA | Sept 15 |
| CPVC Piping (1/2 Day) | Seattle, WA | Sept 15 |
| Hydraulics for Fire Protection | Seattle, WA | Sept 16 |
| Standpipe Systems for Fire Protection (1/2 Day) | Seattle, WA | Sept 17 |
| Fire Pump Layout & Sizing (1/2 Day) | Seattle, WA | Sept 17 |
| NFPA 13 2007 Update | Dayton, OH | Sept 16 |
| Sprinklers for Dwellings | Dayton, OH | Sept 17 |
| CPVC Piping Installation Requirements (1/2 Day) | Dayton, OH | Sept 18 |
| Commissioning and Acceptance Testing (1/2 Day) | Dayton, OH | Sept 18 |
| NFPA 13, 13R, 13D 2007 Update | Anaheim, CA | Sept 22 |
| Hydraulics for Fire Protection | Anaheim, CA | Sept 23 |
| Underground Piping (1/2 Day) | Anaheim, CA | Sept 24 |
| Basic Seismic (1/2 Day) | Anaheim, CA | Sept 24 |
| Plan Review Policies & Procedures | Berlin, VT | Sept 22 |
| Sprinkler Protection for Rack Storage | Berlin, VT | Sept 23 |
| CPVC Piping (1/2 Day) | Berlin, VT | Sept 24 |
| Basic Seismic Protection (1/2 Day) | Berlin, VT | Sept 24 |
| NFPA 13 Overview | Menasha, WI | Sept 30-Oct 1 |
| Hydraulics for Fire Protection | Menasha, WI | Oct 2 |
| Inspection, Testing & Maintenance | Concord, NH | Oct 13 |
| Residential Sprinklers: Homes to High Rise | Concord, NH | Oct 14 |
| Sprinklers for Dwellings | Concord, NH | Oct 15 |
| Underground Piping (1/2 Day) | Woodland, CA | Oct 20 |

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| Commissioning & Acceptance Testing (1/2 Day) | Woodland, CA | Oct 20 |
| Sprinkler Protection for General Storage | Woodland, CA | Oct 21 |
| Sprinkler Protection for Special Storage | Woodland, CA | Oct. 22 |
| Pumps for Fire Protection | Edwardsville, IL | Oct 27 |
| Sprinkler Protection for General Storage | Edwardsville, IL | Oct 28 |
| Sprinkler Protection for Rack Storage | Edwardsville, IL | Oct 29 |
| NFPA 13 Overview | Pembroke, MA | Oct 27-28 |
| Plan Review Policies & Procedures | Pembroke, MA | Oct 29 |
| Inspection, Testing & Maintenance | Irving, TX | Oct 27 |
| Hydraulics for Fire Protection | Irving, TX | Oct 28 |
| NFPA 13, 13R, 13D 2007 Update | Irving, TX | Oct 29 |
| NFPA 13, 13R, 13D 2007 Update | Effingham, IL | Nov 10 |
| Plan Review Policies & Procedures | Effingham, IL | Nov 11 |
| Hydraulics for Fire Protection | Effingham, IL | Nov 12 |
| Sprinkler Protection for Rack Storage | Marana, AZ | Dec 8 |
| Sprinkler Protection for General Storage | Marana, AZ | Dec 9 |
| Basic Seismic Protection (1/2 Day) | Marana, AZ | Dec 10 |
| Advanced Seismic Protection (1/2 Day) | Marana, AZ | Dec 10 |

These seminars qualify for continuing education as required by NICET.

To register or for more information, contact Dawn Fitzmaurice at (845) 878-4207 or send an e-mail to seminars@nfsa.org

NFSA Tuesday eTechAlert is c. 2009 National Fire Sprinkler Association, and is distributed to NFSA members on Tuesdays for which no NFSA Technical Tuesday Online Seminar is scheduled. Statements and conclusions are based on the best judgment of the NFSA Engineering staff, and are not the official position of the NFPA or its technical committees or those of other organizations except as noted. Opinions expressed herein are not intended, and should not be relied upon, to provide professional consultation or services. Please send comments to Russell P. Fleming, P.E. fleming@nfsa.org.

About the National Fire Sprinkler Association

Established in 1905, the National Fire Sprinkler Association (NFSA) is the voice of the fire sprinkler industry. NFSA leads the drive to get life-saving and property protecting fire sprinklers into all buildings; provides support and resources for its members – fire sprinkler contractors, manufacturers and suppliers; and educates authorities having jurisdiction on fire protection issues. Headquartered in Patterson, N.Y., NFSA has regional operations offices throughout the country.
www.nfsa.org.

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