MEMORANDUM

DATE: June 26, 2013

TO: Principal and Alternate Members of the Technical Committee on Residential Sprinkler Systems

FROM: Matt Klaus, Principal Fire Protection Engineer/NFPA Staff Liaison

SUBJECT: AUT-RSS AGENDA PACKAGE – A2015 Pre-First Draft Meeting

Enclosed is the agenda for the Pre-First Draft meeting for NFPA 13D, Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes and NFPA 13R, Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies. NFPA 13D and NFPA 13R have entered the Annual 2015 revision cycle and will produce 2016 Editions. It is imperative that you review the attached public input in advance, with your ideas and substantiations for your views. If you have alternate suggestions for text changes, please come prepared with the words and respective substantiation.

For administrative questions, please feel free to contact Elena Carroll at (617) 984-7952.
For technical questions, please feel free to contact Matt Klaus at (617) 984-7448. You can also reach either of us via e-mail at ECarroll@nfpa.org or MKlaus@nfpa.org. We look forward to meeting everyone in St, Louis, MO at the St. Louis Union Station - a DoubleTree by Hilton Hotel.
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Technical Committee on Residential Sprinkler Systems

Pre-First Draft Meeting
July 10-11, 2013
St. Louis Union Station - a DoubleTree by Hilton Hotel
1820 Market St. One Union Station
St Louis, Missouri, 63103

AGENDA

Wednesday, July 10, 2013

1. Call to Order – 8:00 AM
2. Introductions of Members and Staff
3. Review and Approval of A2012 ROC Meeting Minutes
4. Review of A2015 Revision Cycle and Meeting Schedule
5. Review of Distributed Material and Workload
   a. Overview of Public Input
   b. Overview of Potential Committee First Revisions
6. Establish New Task Groups if Necessary
7. Adjourn 12:00 PM
8. Lunch 12:00 PM – 1:00 PM
9. New Process Training and Mock Meeting 1:00 PM – 4:00 PM

Thursday, July 11, 2013

10. Reconvene for Task Group Meetings – 8:00AM
11. Adjourn (TBD)
PART 2 –

COMMITTEE ADDRESS LIST
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Company/Association</th>
<th>Address</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maurice M. Pilette</td>
<td>Chair</td>
<td>Mechanical Designs Ltd.</td>
<td>19 Erie Drive, Natick, MA 01760</td>
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<tr>
<td>Fred Benn</td>
<td>Principal</td>
<td>Advanced Automatic Sprinkler, Inc.</td>
<td>1947 San Ramon Valley Boulevard, San Ramon, CA 94583</td>
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<tr>
<td>Frederick C. Bradley</td>
<td>Principal</td>
<td>FCB Engineering</td>
<td>9470 Dominion Way, Alpharetta, GA 30022-6111</td>
<td>1/16/1998</td>
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<tr>
<td>Thomas G. Deegan</td>
<td>Principal</td>
<td>The Viking Group, Inc.</td>
<td>161 Ottawa NW Suite 502, Grand Rapids, MI 49503</td>
<td>10/19/1997</td>
</tr>
<tr>
<td>Dawn M. Flancher</td>
<td>Principal</td>
<td>American Water Works Association</td>
<td>6666 West Quincy Avenue, Denver, CO 80235</td>
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</tr>
<tr>
<td>Dana R. Haagensen</td>
<td>Principal</td>
<td>Massachusetts Department of Fire Services</td>
<td>PO Box 1025, Stow, MA 01775</td>
<td>7/26/2007</td>
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<td>Kerry M. Bell</td>
<td>Principal</td>
<td>UL LLC</td>
<td>333 Pfingsten Road, Northbrook, IL 60062-2096</td>
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<td>Jonathan C. Bittenbender</td>
<td>Principal</td>
<td>REHAU Incorporated</td>
<td>1501 Edwards Ferry Road, Leesburg, VA 20176</td>
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<tr>
<td>Phillip A. Brown</td>
<td>Principal</td>
<td>American Fire Sprinkler Association, Inc.</td>
<td>12750 Merit Drive, Suite 350, Dallas, TX 75251</td>
<td>1/16/1998</td>
</tr>
<tr>
<td>Jeffrey Feid</td>
<td>Principal</td>
<td>State Farm Insurance Company</td>
<td>One State Farm Plaza, D-1, Bloomington, IL 61710-0001</td>
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<tr>
<td>Jeffrey S. Grove</td>
<td>Principal</td>
<td>The RJA Group, Inc.</td>
<td>376 East Warm Springs Road, Suite 210, Las Vegas, NV 89119</td>
<td>10/20/2010</td>
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<tr>
<td>Tonya L. Hoover</td>
<td>Principal</td>
<td>CAL Fire, Office of the State Fire Marshal</td>
<td>1131 S Street, PO Box 944246, Sacramento, CA 94244-2460</td>
<td>3/1/2011</td>
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# Residential Sprinkler Systems

## Automatic Sprinkler Systems

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<tr>
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<th>Position</th>
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<th>Email</th>
<th>Address</th>
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<tbody>
<tr>
<td>Mark Hopkins</td>
<td>Principal</td>
<td>AUT-RSS</td>
<td></td>
<td>Principal: Hughes Associates, Inc. 3610 Commerce Drive, Suite 817</td>
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<tr>
<td></td>
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<td>Alternate: Donald Hopkins, Jr.</td>
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<tr>
<td>Gary L. Johnson</td>
<td>Principal</td>
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<td>Principal: Lubrizol 17790 Eglantine Lane Fort Myers Beach, FL 33931</td>
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<td>Committee for Firesafe Dwellings Alternate: David W. Ash</td>
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<tr>
<td>Stephen M. Leyton</td>
<td>Principal</td>
<td>AUT-RSS</td>
<td></td>
<td>Protection Design and Consulting 2851 Camino Del Rio South, Suite 400</td>
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<tr>
<td></td>
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<td>San Diego, CA 92108 American Fire Sprinkler Association Installer/Maintainer Alternate: David W. Ash</td>
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<tr>
<td>Michael O'Brian</td>
<td>Principal</td>
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<td>Principal: Brighton Area Fire Authority 615 West Grand River Avenue</td>
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<td></td>
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<td>Brighton, MI 48116 International Association of Fire Chiefs Alternate: Robert S. Blach</td>
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<tr>
<td>Milosh T. Puchovsky</td>
<td>Principal</td>
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<td>Principal: Worcester Polytechnic Institute Department of Fire Protection Engineering 100 Institute Road Worcester, MA 01609</td>
</tr>
<tr>
<td>Peter T. Schwab</td>
<td>Principal</td>
<td>AUT-RSS</td>
<td></td>
<td>Principal: Wayne Automatic Fire Sprinklers, Inc. 222 Capitol Court</td>
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<td>Ocoee, FL 34761-3033</td>
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<td>Kenneth E. Isman</td>
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<td>National Fire Sprinkler Association, Inc. 40 Jon Barrett Road Patterson, NY 12563</td>
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<td>National Fire Sprinkler Association Design Technician Alternate: Jon R. Ackley</td>
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<td>Ronald G. Nickson</td>
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<td>National Multi Housing Council 1850 M Street NW, Suite 540 Washington, DC 20036</td>
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<td>Alternate: Marshall A. Klein</td>
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<tr>
<td>Steven Orlowski</td>
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<td>National Association of Home Builders 1201 15th Street, NW Washington, DC 20005-2800</td>
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<tr>
<td>Scott C. Pugsley</td>
<td>Principal</td>
<td>AUT-RSS</td>
<td></td>
<td>International Association of Plumbing &amp; Mechanical Officials 4755 East Philadelphia Street Ontario, CA 91761</td>
</tr>
<tr>
<td>Matt Sigler</td>
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<td></td>
<td>International Association of Plumbing &amp; Mechanical Officials 4755 East Philadelphia Street Ontario, CA 91761</td>
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<tr>
<td>Name</td>
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<tr>
<td>Eric J. Skare</td>
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<td>Uponor, Inc. 5925 148th Street West, Apple Valley, MN 55124</td>
<td>AUT-RSS</td>
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<td>George W. Stanley</td>
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<td>Wigonint Fire Protection Engineering, Inc. 699 Aero Lane, Sanford, FL 32771</td>
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<td>Ivey Engineering, Inc. 8330 Juniper Creek Lane, San Diego, CA 92126</td>
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<tr>
<td>Ed Van Walraven</td>
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<td>Aspen Fire Protection District 420 East Hopkins Avenue, Aspen, CO 81611</td>
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<tr>
<td>Terry L. Victor</td>
<td>Principal</td>
<td>Tyco/SimplexGrinnell 705 Digital Drive, Suite N, Linthicum, MD 21090</td>
<td>AUT-RSS</td>
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<tr>
<td>Ronald N. Webb</td>
<td>Principal</td>
<td>S.A. Comunale Company, Inc. 2900 Newpark Drive, Barberton, OH 44203</td>
<td>AUT-RSS</td>
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<tr>
<td>Hong-Zeng Yu</td>
<td>Principal</td>
<td>FM Global 1151 Boston-Providence Turnpike, PO Box 9102, Norwood, MA 02062-9102</td>
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<tr>
<td>Jon R. Ackley</td>
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<td>Dalmatian Fire, Inc. 5670 West 73rd Street, Indianapolis, IN 46278</td>
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<td>David W. Ash</td>
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<td>Robert S. Blach</td>
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<td>Menlo Park Fire Protection District 170 Middlefield Road, Menlo Park, CA 94025</td>
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<td>Katherine M. Clay</td>
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<td>Jackson Hole Fire/EMS, PO Box 901, Jackson, WY 83001</td>
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<td>Bradford T. Cronin</td>
<td>Alternate</td>
<td>Newport Fire Department 21 West Marlborough Street, Newport, RI 02840</td>
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### Residential Sprinkler Systems

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<td>Baltimore, MD 21227-1652</td>
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<td>Eldersburg, MD 21784-6304</td>
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<td>Burnsville, MN 55337</td>
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<td>Canadian Automatic Sprinkler Association</td>
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<td>Jerry R. Hunter</td>
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<td>Leesburg, VA 20176</td>
<td>Principal: Tonya L. Hoover</td>
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<td>Ernie Paez</td>
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<td>Principal: Tonya L. Hoover</td>
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<td>Role</td>
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<td>Richard M. Ray</td>
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<td>Cybor Fire Protection Company 5123 Thatcher Road Downers Grove, IL 60515 National Fire Sprinkler Association Contractor Principal: Ronald N. Webb</td>
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<tr>
<td>Steven R. Rians</td>
<td>Alternate</td>
<td>Standard Automatic Fire Enterprises, Inc. 500 Graham Road PO Box 10408 College Station, TX 77845 American Fire Sprinkler Association Installer/Maintainer Principal: Stephen M. Leyton</td>
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<tr>
<td>Ernesto Rodriguez, Jr.</td>
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<td>Wiginton Fire Protection Engineering, Inc. 699 Aero Lane Sanford, FL 32771 Principal: George W. Stanley</td>
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<tr>
<td>John F. Viola</td>
<td>Alternate</td>
<td>10 Chestnut Hill Road South Hadley, MA 01075 American Fire Sprinkler Association Design Principal: Phillip A. Brown</td>
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<tr>
<td>Matthew J. Klaus</td>
<td>Staff Liaison</td>
<td>National Fire Protection Association 1 Batterymarch Park Quincy, MA 02169-7471</td>
<td>12/16/2010</td>
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PART 3 –
NEW PROCESS WORKSHEETS
### TERMS

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<th>New Terms</th>
<th>Old Terms</th>
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<td><strong>Input Stage</strong> – Stage where Public Input is sought to develop the First</td>
<td><strong>Report on Proposals (ROP) Stage</strong></td>
</tr>
<tr>
<td>Draft.</td>
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<tr>
<td><strong>Public Input (PI)</strong> – A recommended change submitted for consideration</td>
<td><strong>Proposal</strong></td>
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<tr>
<td>by the Technical Committee. Each Public Input (PI) shall include new,</td>
<td></td>
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<tr>
<td>modified or deleted text as appropriate and technical substantiation to</td>
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<td>support the recommended change.</td>
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<tr>
<td><em>Download a Public Input Form</em> for documents in Fall 2013 and</td>
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<td>subsequent cycles</td>
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<td><strong>First Draft Meeting</strong></td>
<td><strong>ROP Meeting</strong></td>
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<tr>
<td><strong>First Revision (FR)</strong> – Proposed changes to the text of an NFPA</td>
<td><strong>Committee Proposal or Accepted</strong></td>
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<tr>
<td>Standard developed by the responsible Committee(s) in the Input Stage.</td>
<td><strong>Public Proposal</strong></td>
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<tr>
<td>Each First Revision shall contain the new, modified or deleted text as</td>
<td></td>
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<td>appropriate.</td>
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<tr>
<td>A First Revision shall be established through a Meeting Vote and shall</td>
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<td>only require a simple majority to proceed to ballot. Only First</td>
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<tr>
<td>Revisions that pass ballot will show in the First Draft. Each First</td>
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<td>Revision shall contain a Committee Statement that substantiates the</td>
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<td>proposed change to the document.</td>
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<td><strong>Committee Input (CI)</strong> – A CI can be established during the First Draft</td>
<td><strong>“Trial Balloon” or an Accepted</strong></td>
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<td>Technical Committee meeting (without balloting) in order to highlight</td>
<td><strong>Proposal (or Committee Proposal) that Failed Ballot</strong></td>
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<td>the concept to obtain public comment; often used for newer ideas, topics</td>
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<td>that aren’t fully fleshed out or controversial topics. A Committee Input</td>
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<td>(CI) can also be a First Revision (FR) that fails to receive support of</td>
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<td>the technical committee through letter ballot. Committee Inputs shall</td>
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<tr>
<td>maintain the original FR Committee Statement and shall contain a</td>
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<td>notification to the reviewer documenting that the CI represents a</td>
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<tr>
<td>failed FR.</td>
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<td><strong>Committee Statement (CS)</strong> – A Committee Statement is the</td>
<td><strong>Committee Statement</strong></td>
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<tr>
<td>committee’s response to a Public Input (PI), Public Comment (PC) or the</td>
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</tr>
<tr>
<td>committee’s technical substantiation for a proposed First Revision.</td>
<td></td>
</tr>
<tr>
<td>A committee statement shall be established through a Meeting Vote and</td>
<td></td>
</tr>
<tr>
<td>shall only require a simple majority to proceed.</td>
<td></td>
</tr>
<tr>
<td><strong>First Draft Report</strong> – The First Draft Report documents the Input Stage;</td>
<td><strong>ROP</strong></td>
</tr>
<tr>
<td>it shall contain the First Draft, Public Input, Committee Input,</td>
<td></td>
</tr>
<tr>
<td>Committee and Correlating Committee Statements, Correlating Input,</td>
<td></td>
</tr>
<tr>
<td>Correlating Notes and Ballot Statements.</td>
<td></td>
</tr>
<tr>
<td><strong>First Draft</strong> – The draft of the proposed new or revised standard</td>
<td><strong>ROP Draft</strong></td>
</tr>
<tr>
<td>showing in legislative text all First Revisions and First Correlating</td>
<td></td>
</tr>
<tr>
<td>Revisions that have passed ballot.</td>
<td></td>
</tr>
<tr>
<td><strong>Correlating Committee (CC)</strong></td>
<td><strong>Technical Correlating Committee</strong></td>
</tr>
<tr>
<td><strong>Correlating Committee Statement</strong> – The Correlating Committee’s</td>
<td><strong>TCC Note</strong></td>
</tr>
<tr>
<td>response to a Public Input (PI), Committee Input (CI), Public Comment</td>
<td></td>
</tr>
<tr>
<td>(PC) or the Correlating Committee’s technical substantiation for a</td>
<td></td>
</tr>
<tr>
<td>correlating change to proposed Revision or a correlative CCFR. It shall</td>
<td></td>
</tr>
<tr>
<td>be established through a Meeting Vote and shall only require a simple</td>
<td></td>
</tr>
<tr>
<td>majority to proceed.</td>
<td></td>
</tr>
<tr>
<td><strong>Correlating Committee First Revision (CCFR)</strong> – Correlating</td>
<td><strong>TCC Note</strong></td>
</tr>
<tr>
<td>Committee First Revisions are proposed revisions to the Technical</td>
<td></td>
</tr>
<tr>
<td>Committee’s First Revisions that are required to correlate the proposed</td>
<td></td>
</tr>
<tr>
<td>document. Each CCFR shall contain a Correlating Committee Statement</td>
<td></td>
</tr>
<tr>
<td>that substantiates the Revision. A CCFR shall be established through a</td>
<td></td>
</tr>
<tr>
<td>Meeting Vote and shall only require a simple majority to proceed to</td>
<td></td>
</tr>
<tr>
<td>letter ballot. CCFRs that fail to receive CC support through letter</td>
<td></td>
</tr>
<tr>
<td>ballot shall not be published as part of the First Draft.</td>
<td></td>
</tr>
<tr>
<td>Comment Stage</td>
<td>Report on Comments (ROC) Stage</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Public Comment</strong> – Changes submitted by the public during public Comment Stage.</td>
<td><strong>Public Comment</strong></td>
</tr>
<tr>
<td><strong>Second Draft Meeting</strong></td>
<td><strong>ROC Meeting</strong></td>
</tr>
<tr>
<td><strong>Second Revision (SR)</strong> – Similar to First Revision, but in the Comment Stage. Proposed changes to the text by the TC that have passed ballot.</td>
<td><strong>Committee Comment or Accepted Public Comment</strong></td>
</tr>
<tr>
<td><strong>Committee Comment</strong> – A Committee Comment shall be a Second Revision (SR) that fails to receive support of the TC through ballot. Committee Comments shall maintain the original Committee Statement and shall contain a notification to the reviewer documenting that the Committee Comment represents a failed SR.</td>
<td><strong>Committee Comment that failed ballot</strong></td>
</tr>
<tr>
<td><strong>Committee Action</strong> – An action by a TC to accept or reject a Comment. This occurs only in the Comment Stage and the action itself is not balloted.</td>
<td><strong>Committee Action</strong></td>
</tr>
<tr>
<td><strong>Second Draft Report</strong> – The Second Draft Report documents the Comment Stage; it shall contain the Second Draft, Public Comments with corresponding Committee Actions and Committee Statements, Committee Comments, Correlating Revisions and Ballot Statements.</td>
<td><strong>ROC</strong></td>
</tr>
<tr>
<td><strong>Second Draft</strong> – The draft of the proposed new or revised standard showing in legislative text all Second Revisions and Second Correlating Revisions that have passed ballot.</td>
<td><strong>ROC Draft</strong></td>
</tr>
</tbody>
</table>
### Possible Action 1: Resolve PIs, (no change to Section)

<table>
<thead>
<tr>
<th>Action Required</th>
<th>Sample Motions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step One:</td>
<td>I make a motion (move) to resolve PI# with the following committee statement:</td>
</tr>
<tr>
<td>Committee generates a statement to respond to (resolve) each PI #</td>
<td>Approval by a meeting vote (simple majority) and not subject to ballot (Regs 4.3.7.3 &amp; 4.3.7.3.2)</td>
</tr>
</tbody>
</table>

### Possible Action 2: Create First Revision - Change to a Section

<table>
<thead>
<tr>
<th>Action Required</th>
<th>Sample Motions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step One:</td>
<td>I make a motion (move) to revise Section as follows:</td>
</tr>
<tr>
<td>(1st option)</td>
<td>Approval by a meeting vote (simply majority) and final approval through ballot (Regs 4.3.9.2.3)</td>
</tr>
<tr>
<td>Committee generates a First Revision</td>
<td></td>
</tr>
<tr>
<td>Step Two:</td>
<td>Approval by a meeting vote (simply majority) (Regs 4.3.7.3)</td>
</tr>
<tr>
<td>(1st option)</td>
<td></td>
</tr>
<tr>
<td>Committee generates a statement substantiating the change.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Action Required</th>
<th>Sample Motions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step One:</td>
<td>I make a motion to revise Section using PI# as the basis for change.</td>
</tr>
<tr>
<td>(2nd option)</td>
<td>Approval by a meeting vote (simply majority) and final approval through ballot (Regs 4.3.9.2.3)</td>
</tr>
<tr>
<td>Committee generates a First Revision using one or more PIs as the starting point.</td>
<td></td>
</tr>
<tr>
<td>Step Two:</td>
<td>I make a motion (move) to resolve PIs # through ## with the following statement:</td>
</tr>
<tr>
<td>(2nd option)</td>
<td>Approval by a meeting vote (simple majority) and not subject to ballot (Regs 4.3.7.3 &amp; 4.3.7.3.1)</td>
</tr>
<tr>
<td>If the revision is associated with one or more PIs the committee generates a statement to respond to (resolve) each PI</td>
<td></td>
</tr>
</tbody>
</table>

### Possible Action 3: Create Committee Input – (Trial Balloon/Placeholder)

<table>
<thead>
<tr>
<th>Action Required</th>
<th>Sample Motions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step One:</td>
<td>I make a motion (move) to create a CI with a proposed revision to X.X.X as follows:</td>
</tr>
<tr>
<td>Committee generates a Committee Input (proposed revision) for public consideration and solicitation of Public Comments</td>
<td>Approval by a meeting vote (simply majority) and not subject to ballot (Regs 4.3.8)</td>
</tr>
<tr>
<td>Step Two:</td>
<td>Approval by a meeting vote (simply majority) (Regs 4.3.7.1)</td>
</tr>
<tr>
<td>Committee generates a statement to explain the intent and why it is seeking public consideration and soliciting Public Comments</td>
<td></td>
</tr>
</tbody>
</table>

New Process Actions and Motions- Final- 2/13/2012
PART 4 –
A2012 ROC MEETING MINUTES
MEETING MINUTES

1. Call to Order. TC Chair Ken Linder called the meeting to order at 8:00 (9/22/11).

2. Self-Introductions of members and guests. Members of the committee introduced themselves and reviewed the contact information. The meeting attendance list is attached to these minutes.

3. Review of Distributed Meeting Materials. Staff Liaison Matt Klaus provided an overview of the agenda materials that were sent to the committee and posted on the committee web page.

4. Approval of A12-ROP Draft Meeting Minutes. The minutes of the A12-ROP Meeting were reviewed and approved without modification.

5. Review of Meeting Procedures and Revision Process. Matt Klaus gave a presentation on the overall meeting guidelines and the NFPA Regulations Governing TC operations.

6. FPRF Presentation. NFPA 1124 Pyro Presentation – Garner Palenske, Aon

Garner Palenske presented Aon's research on pyrotechnic storage arrangements and sprinkler protection. Garner presented a proposed testing plan that could be used to develop sprinkler requirements for pyrotechnic storage/display. The TC anticipates that the testing will be conducted in the near future, but will most likely not be finished by the time the next editions of NFPA 13 and 1124 are released. Bill Koffel will address the NFPA 1124 TC with an interim solution that requires a design professional to produce a performance-based design plan for these occupancies, as no adequately justified prescriptive design criteria exists at this time.

7. Work Load. TC Chair Ken Linder discussed the logistics for the meeting and the process to complete the ROC meeting.
8. **Public and Committee Comments.** The committee then processed the comments. See the ROC for the official actions on the proposals.

9. **New Business:**
   
   a. The TC discussed forming a task group with the SSI TC to review requirements for open grating.

10. **Adjournment.** Meeting adjourned at 7:30 pm (9/23/11).
PART 5 –
A2015 KEY DATES
# 2015 Annual Revision Cycle

*Public Input Dates may vary according to standards and schedules for Revision Cycles may change. Please check the NFPA Website for the most up-to-date information on Public Input Closing Dates and schedules at www.nfpa.org/document # (i.e. www.nfpa.org/101) and click on the Next Edition tab.*

<table>
<thead>
<tr>
<th>Process Stage</th>
<th>Process Step</th>
<th>Dates for TC</th>
<th>Dates for TC with CC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Input Stage (First Draft)</td>
<td>Public Input Closing Date*</td>
<td>7/8/2013</td>
<td>7/8/2013</td>
</tr>
<tr>
<td></td>
<td>Final Date for TC First Draft Meeting</td>
<td>12/13/2013</td>
<td>9/13/2013</td>
</tr>
<tr>
<td></td>
<td>Posting of First Draft and TC Ballot</td>
<td>1/31/2014</td>
<td>10/25/2013</td>
</tr>
<tr>
<td></td>
<td>Final date for Receipt of TC First Draft ballot</td>
<td>7/21/2014</td>
<td>11/15/2013</td>
</tr>
<tr>
<td></td>
<td>Final date for Receipt of TC First Draft ballot - recirc</td>
<td>2/28/2014</td>
<td>11/22/2013</td>
</tr>
<tr>
<td></td>
<td>Posting of First Draft for CC Meeting</td>
<td></td>
<td>11/29/2013</td>
</tr>
<tr>
<td></td>
<td>Final date for CC First Draft Meeting</td>
<td></td>
<td>1/10/2014</td>
</tr>
<tr>
<td></td>
<td>Posting of First Draft and CC Ballot</td>
<td></td>
<td>1/31/2014</td>
</tr>
<tr>
<td></td>
<td>Final date for Receipt of CC First Draft ballot</td>
<td>2/21/2014</td>
<td>2/21/2014</td>
</tr>
<tr>
<td></td>
<td>Final date for Receipt of CC First Draft ballot - recirc</td>
<td>2/28/2014</td>
<td>2/28/2014</td>
</tr>
<tr>
<td></td>
<td><strong>Post First Draft Report</strong> for Public Comment</td>
<td>3/7/2014</td>
<td>3/7/2014</td>
</tr>
<tr>
<td>Comment Stage (Second Draft)</td>
<td>Public Comment Closing Date for Paper Submittal*</td>
<td>4/11/2014</td>
<td>4/11/2014</td>
</tr>
<tr>
<td></td>
<td>Public Comment Closing Date for Online Submittal (e-PC)*</td>
<td>5/16/2014</td>
<td>5/16/2014</td>
</tr>
<tr>
<td></td>
<td>Final Date to Publish Notice of Consent Documents (Standards that received no Comments)</td>
<td>5/30/2014</td>
<td>5/30/2014</td>
</tr>
<tr>
<td></td>
<td>Appeal Closing Date for Consent Standards (Standards that received no Comments)</td>
<td>6/13/2014</td>
<td>6/13/2014</td>
</tr>
<tr>
<td></td>
<td>Final date for TC Second Draft Meeting</td>
<td>10/31/2014</td>
<td>7/25/2014</td>
</tr>
<tr>
<td></td>
<td>Posting of Second Draft and TC Ballot</td>
<td>12/12/2014</td>
<td>9/5/2014</td>
</tr>
<tr>
<td></td>
<td>Final date for Receipt of TC Second Draft ballot</td>
<td>1/2/2015</td>
<td>9/26/2014</td>
</tr>
<tr>
<td></td>
<td>Final date for receipt of TC Second Draft ballot - recirc</td>
<td>1/9/2015</td>
<td>10/3/2014</td>
</tr>
<tr>
<td></td>
<td>Posting of Second Draft for CC Meeting</td>
<td>10/10/2014</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Final date for CC Second Draft Meeting</td>
<td>11/21/2014</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Posting of Second Draft for CC Ballot</td>
<td>12/12/2014</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Final date for Receipt of CC Second Draft ballot</td>
<td>1/2/2015</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Final date for Receipt of CC Second Draft ballot - recirc</td>
<td>1/9/2015</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Post Second Draft Report</strong> for NITMAM Review</td>
<td>1/16/2015</td>
<td>1/16/2015</td>
</tr>
</tbody>
</table>

| Tech Session Preparation (and Issuance) | Notice of Intent to Make a Motion (NITMAM) Closing Date | 3/6/2015 | 3/6/2015 |
| | Posting of Certified Amending Motions (CAMs) and Consent Standards | 5/1/2015 | 5/1/2015 |
| | Appeal Closing Date for Consent Standards | 5/16/2015 | 5/16/2015 |
| | SC Issuance Date for Consent Standards | 5/26/2015 | 5/26/2015 |


| Appeals and Issuance | Appeal Closing Date for Standards with CAMs | 7/15/2015 | 7/15/2015 |
| | SC Issuance Date for Standards with CAMs | 8/20/2015 | 8/20/2015 |

Approved _____ October 18, 2011 ________ Revised _____ March 7, 2013 ________
PART 6 –
NFPA 13D PUBLIC INPUT
Public Input No. 2-NFPA 13D-2012 [ Section No. 3.3.11.1 ]

3.3.11.1 Antifreeze Sprinkler System.
A wet pipe system using automatic sprinklers that contains a liquid solution to prevent freezing of the system, intended to discharge the solution upon sprinkler operation, followed immediately by water from a water supply or the liquid solution from a stored supply.

Statement of Problem and Substantiation for Public Input

Antifreeze solutions are required to be listed. One of the listing requirements is that the liquid is not flammable. Since NFPA 13D only has a 10 minute (7 minute in certain circumstances) water supply, the total amount of solution that would be needed to satisfy the system demand is reasonable. The standard should allow for this option to use a tank full of antifreeze for new systems. If this change is made then changes need to be made to 6.1.2, 6.1.3 & A.3.3.6. See other Public Input.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 09:26:10 EST 2012

Copyright Assignment

I, Peter Schwab, hereby irrevocably grant and assign to the National Fire Protection Association (NFPA) all and full rights in copyright in this Public Input (including both the Proposed Change and the Statement of Problem and Substantiation). I understand and intend that I acquire no rights, including rights as a joint author, in any publication of the NFPA in which this Public Input in this or another similar or derivative form is used. I hereby warrant that I am the author of this Public Input and that I have full power and authority to enter into this copyright assignment.

By checking this box I affirm that I am Peter Schwab, and I agree to be legally bound by the above Copyright Assignment and the terms and conditions contained therein. I understand and intend that, by checking this box, I am creating an electronic signature that will, upon my submission of this form, have the same legal force and effect as a handwritten signature.
Public Input No. 6-NFPA 13D-2012 [ Section No. 3.3.11.8 ]

3.3.11.8 Sprinkler System.
For fire protection purposes, a system that consists of an integrated network of underground and overhead piping designed in accordance with fire protection engineering standards. The installation includes one or more automatic water supplies that includes a water supply source, a water control valve, a waterflow alarm, and a drain and is commonly activated by heat from a fire, discharging water over the fire area. 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. [13 3.3.22]

Statement of Problem and Substantiation for Public Input
Correlates the definition with NFPA 13. There may be some heartburn with the use of the word flow switch in the definition, however, the standard is clear that in 13D sprinkler systems, the flow switch can be removed.

Submitter Information Verification
Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submital Date: Tue Dec 11 09:40:27 EST 2012

Copyright Assignment
I, Peter Schwab, hereby irrevocably grant and assign to the National Fire Protection Association (NFPA) all and full rights in copyright in this Public Input (including both the Proposed Change and the Statement of Problem and Substantiation). I understand and intend that I acquire no rights, including rights as a joint author, in any publication of the NFPA in which this Public Input in this or another similar or derivative form is used. I hereby warrant that I am the author of this Public Input and that I have full power and authority to enter into this copyright assignment.

By checking this box I affirm that I am Peter Schwab, and I agree to be legally bound by the above Copyright Assignment and the terms and conditions contained therein. I understand and intend that, by checking this box, I am creating an electronic signature that will, upon my submission of this form, have the same legal force and effect as a handwritten signature.

/PublicInput/TerraView/Content/13D-2013.ditamap/2/C1355236827409.xml

Public Input No. 32-NFPA 13D-2013 [ Section No. 4.5 ]

4.5 Documentation:
Documentation shall be available upon request to ensure adequate water supply, listed devices, and adequate sprinkler coverage have been addressed.
Working Plans. Working plans shall be drawn to an indicated scale, on sheets of uniform size, with a plan of each floor, and shall show those items from the following list that pertain to the design of the system:

1. Name of owner.
2. Location, including street address.
3. Point of compass.
4. Full height cross section.
5. Ceiling/roof heights and slopes not shown in the full height cross section.
6. Location of partitions, lintels, and doorways. Lintel openings require a cross section view to indicate the area of the opening.
7. Name and label for each area or room.
8. For systems supplied by city mains, location and size of city main in street, and location, size, and type of domestic line, including length to city connection, and water meter location and size. Static and residual hydrants that were used in flow tests shall be shown. The location of the 5 gpm domestic demand shall be indicated.
9. Make, type, model, temperature rating, nominal K-factor, and number of each type of sprinkler, including sprinkler identification number.
10. Pipe type and schedule of wall thickness.
11. Nominal pipe size and cutting lengths of pipe (or center-to-center dimensions). Where typical branch lines prevail, it shall be necessary to size only one typical line.
12. Location and size of riser nipples and drops.
13. Type of fittings and joints.
14. Type and locations of hangers, and methods of securing sprinklers when applicable.
15. Location and size of all valves and drain pipes.
16. Location and size of water gauges.
17. Where the equipment is to be installed as an addition to an existing system, enough of the existing system indicated on the plans to make all conditions clear.
18. A summary of the hydraulics, including the static pressure, residual pressure, and flow of the water supply, the pressure and flow demands at the point of connection to the water supply, and the pressure and flow demands at the bottom of the system riser.
19. Hydraulic reference points shown on the plan that correspond with comparable reference points on the hydraulic calculation sheets.
20. Relative elevations of sprinklers, junction points, and supply or reference points.
21. A graphic representation of the scale used on all plans.
22. Name, address, phone number of the contractor.
23. Where required by the AHJ, documentation of the designer credentials.
24. Indicate by note the minimum rate of water application per sprinkler head, the maximum spacing for each head, and the domestic demand.
25. Information about antifreeze solution used. Indicate the type of antifreeze used, the amount of antifreeze in the system, and information about antifreeze compatibility with the pipe.
Statement of Problem and Substantiation for Public Input

There is little difference in the basic details of information expected to be shown on sprinkler plans submitted to the AHJ, regardless of whether the system is 13D, 13R, or 13 design. However, these three codes have drastically different lists of required information. The intent of this amendment is to update the list of items required on plans so that submittals for 13-D systems are similar to submittals for 13 systems. During design review we need to ask these questions and adding them to the list reduces the number of times we need to go back and forth between plan review and installer. Adding them to the list will reduce plan review times and assist the user and installer.

Submitter Information Verification

Submitter Full Name: Kelly Nicolello
Organization: Western Regional Fire Code Dev
Submittal Date: Tue Apr 16 16:36:45 EDT 2013

Copyright Assignment

I, Kelly Nicolello, hereby irrevocably grant and assign to the National Fire Protection Association (NFPA) all and full rights in copyright in this Public Input (including both the Proposed Change and the Statement of Problem and Substantiation). I understand and intend that I acquire no rights, including rights as a joint author, in any publication of the NFPA in which this Public Input in this or another similar or derivative form is used. I hereby warrant that I am the author of this Public Input and that I have full power and authority to enter into this copyright assignment.

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Public Input No. 7-NFPA 13D-2012 [ New Section after 5.1.1 ]

5.1.1.1.1
When a sprinkler has been removed for any reason, it shall not be reinstalled.

Statement of Problem and Substantiation for Public Input

Add this new section to correlate with NFPA 13 and NFPA 25.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 10:02:25 EST 2012

Copyright Assignment

I, Peter Schwab, hereby irrevocably grant and assign to the National Fire Protection Association (NFPA) all and full rights in copyright in this Public Input (including both the Proposed Change and the Statement of Problem and Substantiation). I understand and intend that I acquire no rights, including rights as a joint author, in any publication of the NFPA in which this Public Input in this or another similar or derivative form is used. I hereby warrant that I am the author of this Public Input and that I have full power and authority to enter into this copyright assignment.

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Public Input No. 8-NFPA 13D-2012 [Section No. 5.1.2]

5.1.2

Devices—Except as permitted by 5.1.2.1 devices and materials used in sprinkler systems shall be listed, unless permitted not to be listed by 5.1.3.

Statement of Problem and Substantiation for Public Input

Modified arrangement of wording.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 10:05:36 EST 2012

Copyright Assignment

I, Peter Schwab, hereby irrevocably grant and assign to the National Fire Protection Association (NFPA) all and full rights in copyright in this Public Input (including both the Proposed Change and the Statement of Problem and Substantiation). I understand and intend that I acquire no rights, including rights as a joint author, in any publication of the NFPA in which this Public Input in this or another similar or derivative form is used. I hereby warrant that I am the author of this Public Input and that I have full power and authority to enter into this copyright assignment.

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5.1.3— 2.1
Tanks, expansion tanks, pumps, hangers, waterflow detection devices, and waterflow valves shall not be required to be listed.

Statement of Problem and Substantiation for Public Input

Deleted the term waterflow. This term is not defined. All valves in a sprinkler system will have waterflow through them.

Related Public Inputs for This Document

<table>
<thead>
<tr>
<th>Related Input</th>
<th>Relationship</th>
</tr>
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<tbody>
<tr>
<td>Public Input No. 8-NFPA 13D-2012 [Section No. 5.1.2]</td>
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Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 10:07:19 EST 2012

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/TerraView/Content/13D-2013.ditamap/2/C1355238439788.xml
Types of pipe other than those specified in Table 5.2.2 shall be permitted to be used where listed for sprinkler system use. Types of pipes other than those specified in Table 5.2.2 shall be permitted to be used where approved for water service use by the local plumbing code and where the following conditions are met:

1. No fire department connection is provided.
2. Be designed to withstand a maximum pressure of not less than 130 psi (8.9) bar.
3. Be installed behind a fire barrier of not less than 1/2 inch gypsum board.

Statement of Problem and Substantiation for Public Input

The stated intent of NFPA 13D is provide an affordable sprinkler system while maintaining a high level of life safety. One of the major arguments that is used to deter the installation of residential sprinklers is the cost. By providing additional piping choices that meet the local plumbing code, price can be reduced making the installation of residential sprinklers more attractive. If the intent of 13D is to provide cost effective protection, other piping choices have to be made available from materials that have long term historical success in the residential environment. By providing additional installation criteria for water service piping materials to be used for sprinkler installation, additional levels of physical and thermal protection are provided. Speaking as an AHJ who is active in campaigning for mandatory residential sprinklers, the reality is that price sells. The lower the price the easier the sell.

Submitter Information Verification

Submitter Full Name: PHILLIP GREEN
Organization: ESTERO FIRE RESCUE
Affilliation: Lee County Fire Marshal and Inspectors Association
Submittal Date: Tue Mar 05 14:50:11 EST 2013

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5.3* Underground Pipe. Any type of pipe or tube acceptable under the applicable plumbing code for underground supply pipe shall be acceptable as an underground supply for a fire sprinkler system when installed between the point of connection and the system riser.

Statement of Problem and Substantiation for Public Input

Editorial change.

Submitter Information Verification

Submitter Full Name: David Kendall
Organization: Thomas & Betts Corporation
Submittal Date: Wed Jan 09 08:55:38 EST 2013

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5.3 Underground Pipe.

5.3.1 Type. Any type of pipe or tube acceptable under the applicable plumbing code for underground supply pipe shall be acceptable as an underground supply for a fire sprinkler system when installed between the point of connection and the system riser.

5.3.2 Depth of Cover.

5.3.2.1 Except where specified otherwise by the applicable plumbing code, the top of the pipe shall be buried not less than 1 ft (0.3 m) below the frost line for the locality. In those locations where frost is not a factor, the depth of cover shall be not less than 2½ ft (0.8 m) to prevent mechanical damage.

5.3.2.2 The depth of cover over water pipes shall be determined by the maximum depth of frost penetration in the locality where the pipe is laid. The depth of cover shall be measured from the top of the pipe to finished grade, and due consideration shall always be given to future or final grade and nature of soil.

5.3.3 Protection Against Damage. Unless specified otherwise by the applicable plumbing code, the pipe shall be protected from mechanical and physical damage.

Statement of Problem and Substantiation for Public Input

Not all jurisdictions employ a plumbing code. Some adopted plumbing codes don’t address these concerns or does not address fire service mains. The proposal addresses the minimum guidelines when not otherwise addressed by the local plumbing code and recognizes a hierarchy that establishes that the local plumbing code takes precedence.

Submitter Information Verification

Submitter Full Name: John Chartier
Organization: Northeastern Regional Fire Cod
Submittal Date: Thu Apr 11 07:39:21 EDT 2013

Copyright Assignment

I, John Chartier, hereby irrevocably grant and assign to the National Fire Protection Association (NFPA) all and full rights in copyright in this Public Input (including both the Proposed Change and the Statement of Problem and Substantiation). I understand and intend that I acquire no rights, including rights as a joint author, in any publication of the NFPA in which this Public Input in this or another similar or derivative form is used. I hereby warrant that I am the author of this Public Input and that I have full power and authority to enter into this copyright assignment.

By checking this box I affirm that I am John Chartier, and I agree to be legally bound by the above Copyright Assignment and the terms and conditions contained therein. I understand and intend that, by checking this box, I am creating an electronic signature that will, upon my submission of this form, have the same legal force and effect as a handwritten signature.
Public Input No. 3-NFPA 13D-2012 [Section No. 6.1.2]

6.1.2
Where stored water is- or antifreeze for new systems is, used as the sole source of supply, the minimum quantity shall equal the water demand rate times 10 minutes unless permitted otherwise by permitted by 6.1.3.

Statement of Problem and Substantiation for Public Input

Antifreeze solutions are required to be listed. One of the listing requirements is that the liquid is not flammable. Since NFPA 13D only has a 10 minute (7 minute in certain circumstances) water supply, the total amount of solution that would be needed to satisfy the system demand is reasonable. The standard should allow for this option to use a tank full of antifreeze for new systems.

Related Public Inputs for This Document

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Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 09:31:00 EST 2012

Copyright Assignment

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Public Input No. 4-NFPA 13D-2012 [Section No. 6.1.3]

6.1.3
Where stored water is or antifreeze for new systems is used as the sole source of supply, the minimum quantity shall be permitted to equal the two sprinkler water demand rate times 7 minutes where dwelling units meet the following criteria:

(1) One story in height
(2) Less than 2000 ft² (186 m²) in area

Statement of Problem and Substantiation for Public Input

Antifreeze solutions are required to be listed. One of the listing requirements is that the liquid is not flammable. Since NFPA 13D only has a 10 minute (7 minute in certain circumstances) water supply, the total amount of solution that would be needed to satisfy the system demand is reasonable. The standard should allow for this option to use a tank full of antifreeze for new systems.

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Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 09:33:40 EST 2012

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/TerraView/Content/13D-2013.ditamap/2/C1355236420101.xml
Public Input No. 10-NFPA 13D-2012 [Section No. 6.2.1]

6.2.1

Where a pump is the source of pressure for the water supply for a fire sprinkler system but is not a portion of the domestic water system, the following shall be met:

(1) A test connection shall be provided downstream of the pump that creates a flow of water equal to the smallest sprinkler K Factor on the system.

(2) Pump motors using ac power shall be connected to a 240 V normal circuit.

(3) Any disconnecting means for the pump shall be approved.

(4) The pump shall not be permitted to sit directly on the floor.

Statement of Problem and Substantiation for Public Input

I believe the intent is to simulate the K Factor of the smallest sprinkler found in the system. Correlates with NFPA 13.

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Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 10:10:10 EST 2012

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6.2.1
Where a pump is the source of pressure for the water supply for a fire sprinkler system but is not a portion of the domestic water system, the following shall be met:

1. A test connection shall be provided downstream of the pump that creates a flow of water equal to the smallest sprinkler on the system.
2. Pump motors using ac power shall be connected to a 240 V normal circuit.
3. Any disconnecting means for the pump shall be approved.
4. The pump shall not be permitted to sit directly on the floor; it shall be a minimum of 12" (305 mm) above the floor.

Statement of Problem and Substantiation for Public Input

Since this is a minimum standard, a definitive dimension should be provided. The 12" dimension is generally accepted as appropriate.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 10:13:25 EST 2012

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Public Input No. 20-NFPA 13D-2013 [ Section No. 6.2.1 ]

6.2.1
Where a pump is the source of pressure for the water supply for a fire sprinkler system but is not a portion of the domestic water system, the following shall be met:

1. A test connection shall be provided downstream of the pump that creates a flow of water equal to the smallest sprinkler on the system.
2. Pump motors using ac power shall be connected to a 240 V normal circuit.
3. Any disconnecting means for the pump shall be approved.
4. The pump shall not be permitted to sit directly on the floor.
5. The pump shall be connected to a back up power source.

Statement of Problem and Substantiation for Public Input

Fire pumps are essential for a sprinkler system to operate. If the power is lost to the pump, the sprinkler system is useless. The back up power source will ensure that the sprinkler system remains in operation in the event of a power failure.

Submitter Information Verification

Submitter Full Name: SEAN SCHWARTZKOPF
Organization: CO DEPT OF PUBLIC HLTH
Submittal Date: Tue Jan 22 21:42:19 EST 2013

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Public Input No. 28-NFPA 13D-2013 [ Section No. 6.2.1 ]
6.2.1
Where a pump is the source of pressure for the water supply for a fire sprinkler system but is not a portion of the domestic water system, the following shall be met:

1. A test connection shall be provided downstream of the pump that creates a flow of water equal to the smallest sprinkler on the system.
2. Pump motors using ac power shall be connected to a 240 V normal circuit.
3. Any disconnecting means for the pump shall be approved.
4. The pump shall not be permitted to sit directly on the floor.
5. The pump (wetted parts and impeller shaft) must be of a non-ferrous type construction.
6. The pump must be demonstrated to run properly after installation.
7. There must be a loss of power alarm on the pump system.

Statement of Problem and Substantiation for Public Input

5 - non-ferrous pump - the addition of this requirement will eliminate or greatly reduce the probability of pump seizure that will occur when a cast iron pump sits with water in it for an extended period of time. This is of great importance as there is no current standard for testing/running the system on an annual basis.

6 - must run pump - to ensure that the pump system is installed properly and in working order before the job is complete.

7 - loss of power alarm - there is no current way for a homeowner to know if the power supply to the pump has been disconnected rendering the sprinkler system useless. With the addition of an alarm the loss of power to the pump will be detected before a fire event occurs while the pump has no power.

Submitter Information Verification

Submitter Full Name: RAYMOND M FREMONT
Organization: GENERAL AIR PRODUCTS
Submittal Date: Wed Mar 27 15:45:14 EDT 2013

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Public Input No. 34-NFPA 13D-2013 [ Section No. 6.2.3.1 ]

6.2.3.1
The control valve shall be permitted to serve the domestic water supply.

Statement of Problem and Substantiation for Public Input

This change requires that sprinkler systems be controlled with the same valve as the domestic supply. This will prevent homeowners from shutting down their sprinkler system and keep the system in disrepair.

Submitter Information Verification

Submitter Full Name: Kelly Nicolello
Organization: Western Regional Fire Code Dev
Submittal Date: Tue Apr 16 16:42:25 EDT 2013

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Public Input No. 21-NFPA 13D-2013 [ Section No. 6.3.4 ]

6.3.4
A warning sign, with minimum ¼ in. (6 mm) letters, shall be affixed adjacent to the main shutoff valve and shall state the following:

WARNING: The water system for this home supplies fire sprinklers that require certain flows and pressures to fight a fire. Devices that restrict the flow or decrease the pressure or automatically shut off the water to the fire sprinkler system, such as water softeners, filtration systems, and automatic shutoff valves, shall not be added to this system without a review of the fire sprinkler system by a fire protection specialist. Do not remove this sign.

See uploaded file.
Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

Note: This Proposal originates from Tentative Interim Amendment 13D-13-2 (TIA 1041) issued by the Standards Council on August 9, 2012.

This proposed language is currently located within the “Common Supply Pipes” section of Chapter 6. This sign is not appropriate for this section and is only needed for multipurpose piping systems. This section should be moved to 6.3.4 so that it falls under the “Multipurpose Piping” heading.

Emergency Nature: This was a mistake that the committee made between the ROP and ROC. Originally wording was in 6.3(5), 2007 Edition. Originally proposed as 6.3.4 during ROP and then moved for some reason to 6.5.3. This sign is not necessary on stand-alone systems. Because of construction practices in California the sign must be places at the meter by the street or on the outside of the home sometimes by the front door. This is a major problem for the builders, their marketing departments and their sales personnel.

Submitter Information Verification

Submitter Full Name: Fred Benn
Organization: Advanced Automatic Sprinkler,
Submittal Date: Fri Jan 25 10:39:06 EST 2013

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/TerraView/Content/13D-2013.ditamap/2/C1359128346648.xml
6.4 Manufactured Home Water Supply.
For sprinklered buildings manufactured off-site, the minimum flow and pressure needed to satisfy the system design criteria on the system side of the meter shall be specified on a data plate by the manufacturer.

Additional Proposed Changes

File Name          Description Approved
Open  13D_Telford.pdf   Cover Sheet

Statement of Problem and Substantiation for Public Input

Pressure alone is not adequate information to establish whether the available supply is acceptable. A corresponding flow at design pressure needs to be stipulated. While it is understood that a 2-sprinkler calculation results in a relatively low flow relative to available flow in typical city supplies, some of these supply curves are very "steep" and drop of pressure very quickly during flowign conditions. The system hydraulic calculation report identifies required flow and should be included to assure adequacy. This comment is being submitted by the Tyco Codes and Standards Sprinkler Task Group.

Submitter Information Verification

Submitter Full Name: BRANDON TELFORD
Organization: Tyco Fire Protection Products
Submittal Date: Mon Jun 03 12:36:59 EDT 2013

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7.2.4*

Where waterflow alarms are provided, test connections shall be installed at locations that allow flow testing of water supplies, connections, and alarm mechanisms.

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

If my proposal to change 7.6 to require local waterflow alarms on all 13D systems is accepted, section 7.2.4 needs to be modified because the phrase; where provided, would not be correct.

Submitter Information Verification

Submitter Full Name: Michael Henke
Organization: Potter Electric Signal Company
Submittal Date: Mon Apr 29 09:30:26 EDT 2013

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7.2.5

The test connections, where provided, shall contain an orifice K Factor equal to or smaller than the smallest sprinkler K Factor installed in the system.

Statement of Problem and Substantiation for Public Input

Correlates with NFPA 13 by using the term K Factor.

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Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 10:16:07 EST 2012

Copyright Assignment

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/TerraView/Content/13D-2013.ditamap/2/C1355238967302.xml
7.2.5
The test connections, where provided, shall contain an orifice equal to or smaller than the smallest sprinkler installed in the system.

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

If my proposal to change 7.6 to require local waterflow alarms on all 13D systems is accepted, section 7.2.5 needs to be modified because the phrase; where provided, would not be correct.

Submitter Information Verification

Submitter Full Name: Michael Henke
Organization: Potter Electric Signal Company
Submittal Date: Mon Apr 29 09:32:40 EDT 2013

Copyright Assignment

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**Public Input No. 1-NFPA 13D-2012 [ Section No. 7.2.6 ]**

**7.2.6**

Where a pressure-reducing or pressure-regulating valve is installed on a stand alone system, a pressure gauge and a test connection with an orifice—a K Factor at least as large as the smallest orifice sprinkler or smallest K Factor on the system shall be installed downstream of the device.

**Statement of Problem and Substantiation for Public Input**

There has been a shift in NFPA 13 to use the term K Factor in place of orifice.

**Submitter Information Verification**

Submitter Full Name: Peter Schwab  
Organization: Wayne Automatic Fire Sprinkler  
Submittal Date: Tue Dec 11 08:18:28 EST 2012

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/TerraView/Content/13D-2013.ditamap/2/C1355231908126.xml
Public Input No. 38-NFPA 13D-2013 [ Section No. 7.6 ]

7.6* Alarms.
Local waterflow alarms shall be provided on all sprinkler systems in homes not equipped with smoke alarms or smoke detectors in accordance with NFPA 72 - National Fire Alarm and Signaling Code.

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

The standard states that the purpose of a 13D system is to aid in the detection and control of residential fires and that the systems are designed to prevent flashover in the room of origin and to provide sufficient time for the occupants to escape. NFPA 13D systems are life safety systems. By definition, a life safety system should notify the occupants of the facility when that system is operating so the occupants can escape. As the standard states, that is the purpose of a 13D system, providing sufficient time to escape. If people are not notified of the fire emergency, they cannot escape. While homes are required to have smoke alarms, the fire may start in an area where there are no smoke alarms, the smoke alarm may not function or the sprinkler system may operate before the smoke alarm. The Prevalent use of lightweight material in the construction of residential occupancies makes early occupant notification of a fire emergency essential so the occupants can evacuate. The addition of a waterflow alarm will aid in occupant notification and evacuation which is the purpose of a life safety system.

Submitter Information Verification

Submitter Full Name: Michael Henke
Organization: Potter Electric Signal Company
Submittal Date: Mon Apr 29 09:34:20 EDT 2013

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/TerraView/Content/13D-2013.ditamap/2/C1367242460357.xml
7.7 Attics Unconditioned Spaces
When nonmetallic piping is installed in attics, adequate insulation of unconditioned spaces shall be provided to ensure that the piping is insulated or covered with insulation to a minimum of R-2 level. Insulation shall be provided on the attic unconditioned space side of the piping to avoid exposure of the piping to temperatures in excess of the pipe's rated temperature.

Statement of Problem and Substantiation for Public Input

The IECC (International Energy Conservation Code®) requires water piping installed in unconditioned spaces to be insulated to a minimum R-2 level. Fiberglass insulation with a depth of 1 inch would provide more than R-2 insulation. Commonly available tube insulation also provides R-2 insulation. This provision should apply to all unconditioned spaces where pipe passes through, not just attics.

Prevent components and assemblies from exceeding their listing and failing due to high temperatures.

Submitter Information Verification

Submitter Full Name: Kelly Nicolello
Organization: Western Regional Fire Code Dev
Submittal Date: Tue Apr 16 16:38:35 EDT 2013

Copyright Assignment

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/TerraView/Content/13D-2013.ditamap/2/C1366144715747.xml
Note: This Proposal originates from Tentative Interim Amendment 13D-10-3 (TIA 1028R) issued by the Standards Council on August 11, 2011.

8.1.2.1 For each of the following situations, the number of sprinklers in the design area shall be all of the sprinklers within a compartment, up to a maximum of two sprinklers, that require the greatest hydraulic demand:

(1) A flat, smooth, horizontal ceiling with no beams up to a maximum of 24 ft (7.3 m) above the floor.

(2) A smooth, flat, sloped ceiling with no beams up to a maximum slope of 8 in 12. The highest portion of the ceiling shall not be more than 24 ft (7.3 m) above the floor. The highest sprinkler in the sloped portion of the ceiling shall be above all openings from the compartment containing the sloped ceiling into any communicating spaces.

(3) A sloped ceiling with beams up to 14 in. (4.3 m) deep with pendent sprinklers under the beams. The compartment containing the sloped, beamed ceiling shall be a maximum of 600 ft² (56 m²) in area. The slope of the ceiling shall be between 2 in 12 and 8 in 12. The highest portion of the ceiling shall not be more than 24 ft (7.3 m) above the floor. The highest sprinkler in the sloped portion of the ceiling shall be above all openings from the compartment containing the sloped ceiling into any communicating spaces.

(4) A sloped ceiling with beams of any depth with sidewall or pendent sprinklers in each pocket formed by the beams. The compartment containing the sloped, beamed ceiling shall be a maximum of 600 ft² (56 m²) in area. The slope of the ceiling shall be between 2 in 12 and 8 in 12. The highest portion of the ceiling shall not be more than 24 ft (7.3 m) above the floor.

8.1.2.2 For situations not meeting one of the conditions in 8.1.2.1, residential sprinklers listed for use in specific ceiling configurations shall be permitted to be used in accordance with their listing.

8.1.2.3* For situations not meeting one of the conditions in 8.1.2.1 and 8.1.2.2, the number of sprinklers in the design area shall be determined in consultation with the authority having jurisdiction as appropriate for the conditions. Sprinklers shall be installed in accordance with their listing where a type of ceiling configuration is referenced in the listing.

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

This proposed language is based upon the findings of the Fire Protection Research Foundation’s project on residential sprinklers and sloped and beamed ceilings into NFPA 13D. The limitations of the test facility have been translated into limitations on the generic use of residential sprinklers. The maximum ceiling height of 24 ft. and limitation on communicating spaces considers the data generated under the FPRF project as well as other fire tests conducted at other times. This same language was accepted by the Technical Committee as proposal 13D-67 Log #CP9 at the A2012 ROP meeting. Please see the attached FPRF Report for the technical substantiation supporting this language.

Emergency Nature: The information provided in the FPRF report was not available to the technical committees during the development of the 2010 edition. The absence of information of this type contributed to the lack of direction on this subject within the document. Lack of clear guidance from the committee on these issues significantly drives up the installed cost of residential sprinkler systems. These cost increases have been referenced by certain jurisdictions as reasons they have chosen not to adopt or have repealed existing residential sprinkler ordinances within their communities and is the reason this amendment is emergency in nature.
Submitter Information Verification

Submitter Full Name: James Golinveaux
Organization: Tyco Fire Suppression & Building Products
Submittal Date: Mon Jun 17 12:52:25 EDT 2013

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Public Input No. 53-NFPA 13D-2013 [ Section No. 8.1.2 ]

Note: This Proposal originates from Tentative Interim Amendment 13D-10-3 (TIA 1028R) issued by the Standards Council on August 11, 2011.

8.1.2 Nonresidential Number of Design Sprinklers
Sprinklers other than residential sprinklers shall be installed in accordance with the coverage criteria specified by NFPA 13.

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

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chosen not to adopt or have repealed existing residential sprinkler ordnances within their communities and is the reason this amendment is emergency in nature.

Submitter Information Verification

Submitter Full Name: James Golinveaux
Organization: Tyco Fire Suppression & Building Products
Submittal Date: Mon Jun 17 12:50:58 EDT 2013

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Public Input No. 49-NFPA 13D-2013 [ New Section after 8.1.3 ]

Note: This Proposal originates from Tentative Interim Amendment 13D-10-3 (TIA 1028R) issued by the Standards Council on August 11, 2011.

8.1.3.1.3 Sloped Ceilings.

8.1.3.1.3.1 Where the ceiling is sloped, the maximum S dimension shall be measured along the slope of the ceiling to the next sprinkler, as shown in Figure 8.1.3.1.3.1.

8.1.3.1.3.2 The sprinklers shall maintain the minimum listed spacing, but no less than 8 ft (2.44 m), measured in the plan view from one sprinkler to another, as shown in Figure 8.1.3.1.3.1.

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

This proposed language is based upon the findings of the Fire Protection Research Foundation’s project on residential sprinklers and sloped and beamed ceilings into NFPA 13D. The limitations of the test facility have been translated into limitations on the generic use of residential sprinklers. The maximum ceiling height of 24 ft. and limitation on communicating spaces considers the data generated under the FPRF project as well as other fire tests conducted at other times. This same language was accepted by the Technical Committee as proposal 13D-67 Log #CP9 at the A2012 ROP meeting. Please see the attached FPRF Report for the technical substantiation supporting this language.

Emergency Nature: The information provided in the FPRF report was not available to the technical committees during the development of the 2010 edition. The absence of information of this type...
contributed to the lack of direction on this subject within the document. Lack of clear guidance from the committee on these issues significantly drives up the installed cost of residential sprinkler systems. These cost increases have been referenced by certain jurisdictions as reasons they have chosen not to adopt or have repealed existing residential sprinkler ordnances within their communities and is the reason this amendment is emergency in nature.

Submitter Information Verification

Submitter Full Name: James Golinveaux
Organization: Tyco Fire Suppression & Building Products
Submittal Date: Mon Jun 17 12:37:39 EDT 2013

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8.2.1.3
Pendent and upright sprinklers in closets shall be permitted to be installed within 12 with their deflectors within 13 in. (305-330 mm) of the ceiling in order to avoid obstructions near the ceiling.

Statement of Problem and Substantiation for Public Input

First of all, this change clarifies what part of the sprinkler you measure to. Secondly, a very common depth soffit is 12” deep. The 13 inch allowance makes it possible to install a semi recessed sprinkler in such a soffit.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 10:19:08 EST 2012

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Public Input No. 47-NFPA 13D-2013 [ New Section after 8.2.5.1 ]

General

Where not addressed in this standard, sprinklers shall be allowed to be positioned in accordance with the obstruction rules specified by NFPA 13, *Standard for the Installation of Sprinkler Systems*.

Statement of Problem and Substantiation for Public Input

NFPA 13 is referenced as an alternate design source in other areas within NFPA 13D. Adding this general statement (ideally as 8.2.5.1 with subsequent renumbering of following sections), will provide additional guidance for designers and AHJ's when confronted by situations not specifically referenced in 13D. [Editorial comment: the TerraView input process did not allow the selection and insertion in what I believe is the proper location].

Submitter Information Verification

Submitter Full Name: Eric Skare  
Organization: Uponor, Inc.  
Submittal Date: Wed May 29 17:39:48 EDT 2013

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Public Input No. 19-NFPA 13D-2013 [ New Section after 8.2.5.2.1 ]

8.2.5.2.1.1

Pendent sprinklers shall be spaced in accordance with 8.2.5.4 when installed adjacent to ceiling mounted fluorescent light fixtures.

Statement of Problem and Substantiation for Public Input

The original testing for obstructions to residential sprinklers was performed with ceiling fans. Generally a ceiling fan will have a rosette or circular ceiling flange. When a fluorescent light is present they are usually 4" deep and are rectangular in nature. Common dimensions are 12" x 48" or 24" x 48". If you measure from the center out, there can still be an obstruction that is only 12" from the sprinkler if it is spaced 36" from the center of the light. In this case the beam rule is more appropriate.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Jan 15 13:31:43 EST 2013

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Public Input No. 46-NFPA 13D-2013 [ Section No. 8.2.5.2.3 ]

8.2.5.2.3
Where the sprinkler cannot be located 3 ft (914 mm) away from the obstruction (as measured from the center of the obstruction), an additional sprinkler shall be located on the other side of the obstruction, without regard to minimum sprinkler spacing.

Statement of Problem and Substantiation for Public Input

In many residential compartments, it can be very difficult to locate sprinklers and still meet all spacing requirements when adding a second sprinkler on the opposite side of an obstruction such as a light or ceiling fan. Cold soldering should not be a consideration since the obstruction is considered to be blocking the spray pattern, resulting in the addition of the second sprinkler in the first place.

Submitter Information Verification

Submitter Full Name: Eric Skare
Organization: Uponor, Inc.
Submittal Date: Wed May 29 17:03:18 EDT 2013

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8.2.5.2.5

Fans installed with the blades and the motor greater than 18 in (0.46 m) below the sprinkler deflector shall not be considered obstructions.

Statement of Problem and Substantiation for Public Input

Fans installed a sufficient distance below the sprinkler deflector will not prevent the pattern from developing.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Fri May 03 11:05:53 EDT 2013

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Original Hide Markup
8.2.5.4.3
Sprinklers shall be positioned with respect to an obstruction against a wall in accordance with Figure 8.2.5.4.3 (a) or Figure 8.2.5.4.3(b).

Figure 8.2.5.4.3 Positioning of Sprinkler to Avoid Obstruction Against Walls (Residential Upright and Pendent Spray Sprinklers).

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

This common situation needs to be addressed in the standard

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Mar 26 15:25:58 EDT 2013

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FIGURE 8.2.5.4.3(b) Positioning of Sprinkler to Avoid Obstruction Against Wall (Residential Upright and Pendent Spray Sprinklers)

Elevation view

\[
A \geq (D - 8 \text{ in.}) + B \\
[A \geq (D - 0.2 \text{ m}) + B] \\
\text{where } D < 30 \text{ in. (0.8 m)}
\]
9.1.1 Wet Pipe Systems in Areas Above 40°F (4°C).

A wet pipe system shall be permitted to be used where all piping is installed in areas maintained above 40°F (4°C), including areas properly insulated to maintain 40°F (4°C).

For more information, see the U.S. Department of Energy’s publication “Measure Guideline: Insulating and Air Sealing Attic Sprinklers”.

Additional Proposed Changes

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<td>Measure_Guideline_Attic_Sprinklers.pdf</td>
<td>US Department of Energy publication which describes specifics of attic sprinkler insulation and air sealing. Section 4 and 6 of this document are particularly useful to NFPA readers.</td>
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Statement of Problem and Substantiation for Public Input

The NFPA 13 series only provides readers with a limited description of attic sprinkler insulation and air sealing methods. Specifically, the level of detail contained in NFPA 13D does not provide enough information for the reader to fully understand proper freeze protection methods in residential homes. While the code handbook does provide some useful bullet points and diagrams on some acceptable methods, it leaves too many gaps that can allow for improper sprinkler freeze protection. With the 2009 International Residential Code (IRC 2009) now requiring automated sprinkler systems in single- and two-family residences, attic sprinkler insulation has transformed from a once uncommon building component to a mainstream staple in residential new-construction. As a result, the level of freeze protection detail in past NFPA publications—that was once satisfactory when sprinklers were not required under residential building code—is no longer adequate now that sprinklers have become a widely-adopted standard installation.

As part of the U.S. Department of Energy’s Building America program, the Consortium of Advanced Residential Building (CARB) has recently completed a guideline titled “Measure Guideline: Insulating and Air Sealing Attic Sprinklers”. This resource provides an in-depth explanation of all aspects pertaining sprinkler freeze protection including: appropriate R-value insulation levels, methods for adequately sealing sprinkler heads, implications of various pipe mounting options, etc. (all of which are not adequately described in NFPA 13D). The measure guideline details each part of the freeze protection process with diagrams and photographs that enable the reader to visualize what a proper installation should look like.

Often times, attic sprinklers are incorrectly insulated and/or air sealed. This becomes a safety risk that can inhibit them from functioning correctly. However, this is a risk that can be avoided by providing readers with enough information on sprinkler freeze protection. In order to fully inform readers with the details needed, NFPA 13D should either expand upon current sprinkler freeze protection documentation or supplement the text by referencing CARB’s guideline: http://www.nrel.gov/docs/fy13osti/56667.pdf. CARB would like to work with NFPA to improve current code standards to give the reader more information on sprinkler freeze protection through insulation and air sealing.

Submitter Information Verification
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Public Input No. 22-NFPA 13D-2013 [Section No. 9.2]

9.2* Antifreeze Systems.
9.2.1* Conformity with Health Regulations.
The use of antifreeze solutions shall be in conformity with any state or local health regulations.
9.2.2* Antifreeze Solutions.
9.2.2.1
Except as permitted in 9.2.2.3, antifreeze solutions shall be listed for use in new sprinkler systems.
9.2.2.1.1
For existing systems, antifreeze solutions shall be limited to premixed antifreeze solutions of glycerine (chemically pure or United States Pharmacopoeia 96.5 percent) at a maximum concentration of 50 percent by volume, propylene glycol at a maximum concentration of 40 percent by volume, or other solutions listed specifically for use in fire protection systems.
9.2.2.2*
Premixed solutions of glycerine (chemically pure or United States Pharmacopoeia 96.5 percent at a maximum concentration of 48 percent by volume or propylene glycol at a maximum concentration of 38 percent by volume shall be permitted to protect piping that is supplying sprinklers in a specific area of the dwelling unit, where acceptable to the authority having authority.
9.2.2.2.1*
Documentation shall be presented to the AHJ to substantiate the use of the antifreeze solution.
9.2.2.3
The concentration of antifreeze solutions shall be limited to the minimum necessary for the anticipated minimum temperature.
9.2.2.4*  
The specific gravity of the antifreeze solution shall be checked by a hydrometer with a scale having 0.002 subdivisions.

9.2.3*  Arrangement of Supply Piping and Valves.

9.2.3.1 Connections Between Antifreeze System and Wet Pipe System with No Backflow Prevention Device.

9.2.3.1.1  
A 5 ft (1.5 m) drop pipe, or U-loop, shall be installed in the connection between the antifreeze system and the wet pipe system as illustrated in Figure 9.2.3.1.1.

**Figure 9.2.3.1.1 Arrangement of Supply Piping and Valves.**

9.2.3.1.2  
If sprinklers are above the level of the water supply to the antifreeze system, a check valve with a $\frac{1}{32}$ in. (0.8 mm) hole in the clapper shall be provided in the U-loop.

9.2.3.1.3  
Valves shall be provided as illustrated in Figure 9.2.3.1.

9.2.3.1.4  
Arrangement of supply piping when the water supply comes from a storage tank or the water supply feeds through a check valve that does not have a $\frac{1}{32}$ in. (0.8 mm) hole drilled in the clapper shall meet the requirements of 9.2.3.2.2.

9.2.3.2*  Connections Between Antifreeze System and Wet Pipe System with Backflow Prevention Device Installed.

9.2.3.2.1  
Valves shall be provided as illustrated in Figure 9.2.3.1.

**Figure 9.2.3.2.1 Arrangement of Supply Piping with Backflow Device.**

9.2.3.2.2  
An expansion chamber shall be provided as illustrated in Figure 9.2.3.2.1.

9.2.3.2.3  
The expansion chamber shall be sized based on the minimum and maximum volume of the antifreeze solution over the life of the system.
9.2.4 Hydrostatic Test.
Where pendent sprinklers are utilized, and where a hydrostatic test shall be performed, the hydrostatic test shall be performed with water and then the water shall be completely drained before antifreeze solution is placed in the system, or the hydrostatic test shall be performed with antifreeze solution at the proper concentration for the system.

9.2.5 Placard Information.
A placard shall be placed on the antifreeze system main valve that indicates the manufacturer type and brand of antifreeze solution, the concentration of antifreeze solution used, and the volume of the antifreeze solution used in the system.

See uploaded file.

Additional Proposed Changes

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<th>Description</th>
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<td>Rec text from TIA</td>
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</tbody>
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Statement of Problem and Substantiation for Public Input

Note: This Proposal originates from Tentative Interim Amendment 13D-13-1 (TIA 1067) issued by the Standards Council on August 9, 2012.

The Technical Committee on Residential Sprinkler Systems is taking a different path in dealing with antifreeze in NFPA 13D than it has in NFPA 13R or than the Sprinkler System Installation Criteria Committee is taking with NFPA 13. This different path is fundamentally based on the fact that one- and two-family dwellings are treated differently in building codes and fire codes than other types of occupancies and in recognition of the fact that NFPA 13D has a different objective than NFPA 13R and NFPA 13.

From its inception in 1975, NFPA 13D has been less stringent than NFPA 13 in order to present a document that balances the issues of reasonable fire protection with the realistic concerns of cost and redundancy. NFPA 13D has always recognized that if fire sprinkler systems are too much like NFPA 13, they will not be installed in one- and two-family dwellings and they will not be able to help change the fact that thousands of people continue to die each year due to fires in unsprinklered one-and two-family dwellings. As such, the Technical Committee on Residential Sprinkler Systems, concerned with the overall effort to get sprinkler systems into more one- and two-family dwellings is consciously choosing to be less restrictive than NFPA 13, while still maintaining a reasonable level of fire safety for the occupants of sprinklered one- and two-family dwellings.

The information provided in the report, Antifreeze Systems in Home Fire Sprinkler Systems – Phase II Report (Fire Protection Research Foundation, December 2010) was the basis for TIA 10-2 to NFPA 13D that was issued by the NFPA on March 1, 2011. That research report is still valid and demonstrates how residential sprinklers perform in typical dwelling units of typical one- and two-family dwellings with a variety of antifreeze solutions tested through a variety of pendent and sidewall residential sprinklers.

Subsequent testing has been performed as a part of a project sponsored by the Fire Protection Research Foundation (FPRF), who released an interim report in February of 2012 titled, Antifreeze Solutions Supplied through Spray Sprinklers. This report followed up on the Phase II tests and looked at antifreeze solutions and their performance with a variety of standard spray sprinklers. Given that NFPA 13D calls for the use of residential sprinklers in all locations except mechanical closets and unheated areas not intended for living purposes (see section 7.5.3 and 7.5.4 of NFPA 13D), the results of this latest FPRF research is less important to NFPA 13D. Still, in reviewing the results of the tests, the committee has chosen to tighten up the rules with respect to new installations by proposing this TIA so that designers can make better decisions regarding the potential use of antifreeze systems. For existing systems, the committee is not recommending any changes from the TIA processed and issued in March of 2011.
Based on input from Authorities Having Jurisdiction, a total ban on antifreeze systems is not realistic and would be detrimental to the effort to pass legislation for mandatory sprinkler requirements in one- and two-family dwellings. Since there are currently no listed antifreeze solutions, a requirement to only use listed antifreeze would be tantamount to a ban on the use of antifreeze. While the use of listed antifreeze systems is probably the best long-term solution, some recognition of glycerine or propylene glycol is necessary in the short term, even for new systems. NFPA 13D systems are intended to be cost effective. Completely eliminating the use of antifreeze in specific, isolated areas, may significantly drive up the cost of residential sprinkler systems.

This TIA starts out expressing a preference for the use of listed antifreeze systems in section 9.2.2.1, but then goes on to allow the use of unlisted 48% glycerine or 38% propylene glycol where two conditions are met. The first condition is that the system has to be acceptable to the Authority Having Jurisdiction (AHJ). It is anticipated that the AHJ will understand the gravity of the decision and only approve situations where other options have been explored and rejected as impossible or impractical. The second condition is that the antifreeze has to be limited to a “specific area”. The committees intent is to limit the antifreeze as much as possible to the portion of the system that will experience the cold temperatures. This language is the best that the committee could agree on that allowed the flexibility necessary to handle the wide range of design situations that currently exist. It is anticipated that the AHJ would be able to consider each situation on a case-by-case basis and determine if the system was sufficiently isolated.

The use of 48% glycerine and 38% propylene glycol is supported by the Phase II test report discussed above when limited to residential sprinklers in typical dwelling units. This position is strengthened by the existing requirement in section 9.2.2.2 (which becomes 9.2.2.3 in this TIA), which requires the antifreeze to be limited to what is needed for the environment. If the pipe is only going to be subjected to temperatures of 20°F, then a solution of 48% glycerine would not be permitted and a premixed solution of 25% glycerine should be used instead since this is all that is needed to protect down to 20°F.

In order to provide the designer with as much information as possible, so that informed decisions can be made, this TIA proposes an expanded annex section that discusses the findings of the various tests that have been performed, including the latest tests just released. This should help designers understand the risks involved and the consequences of their decisions and help guide them to keep antifreeze solutions to the lowest possible concentrations if they decide they want to use antifreeze at all.

This TIA does not propose changes to the rules for existing systems (allowing them to stay as they were in TIA 10-2 with up to 50% glycerine and 40% propylene glycol). This decision was made after a review of the testing programs to date and a first order risk analysis that looked at the potential problems that would arise if we forced people to retroactively change out their existing systems. This risk analysis shows that the risk of changing the antifreeze requirements for existing building and forcing building owners to make a change is higher (6 to 6.3 deaths per year) than leaving the 50% glycerine or 40% propylene glycol in systems (3.0 to 3.6 deaths/year). The following is a summary of this analysis:

Risk Analysis for Antifreeze Systems
Assumptions

- There are approximately 100 million homes (1 and 2 family) in America
- There are approximately 300,000 fires in the homes each year (0.003 fires/home/year)
- There are approximately 3000 fire deaths per year in homes (0.01 deaths/fire)
  - Of these fire deaths, 10% occur in fires that started in spaces that NFPA 13D does not require to be sprinklered, so these deaths will be assumed in this analysis to occur, even in sprinklered homes, even though actual fire experience has shown that sprinklers in adjacent rooms sometimes activate to control these fires and significant losses are not being experienced.
  - In an effort to be conservative, this analysis will also assume that sprinklers are only 90% effective, even though significant work has shown them to be much more effective
- There are approximately 2 million sprinklered homes in America (2% of all homes)
- There are approximately 500,000 systems (25% of all sprinklered homes) with antifreeze that is required right now by NFPA 13D to be a maximum of 50% glycerin or 40% propylene glycol
o There are approximately 1500 fires/yr in the homes with these antifreeze systems
o There have been no deaths associated with fires in homes having antifreeze systems with 50% or less glycerine or 40% or less propylene glycol
o There have been two incidents of flash fires in the last 5 years causing 1 death and 2 serious injuries in apartments. In both cases, the system concentration is believed to have been greater than 50% with one of these being believed to be 70% glycerine and the other 60% glycerine. For the purposes of this conservative analysis, the 2 serious injuries will be considered as deaths.
 o Using these last two bullet points, the risk of death due to flash fire caused by the antifreeze is between 0 and 0.0004 deaths per year depending on what mix of concentrations is assumed for the population of sprinklered homes with antifreeze in the systems.

If the Situation is Left "As Is" with 50% Glycerine or 40% Propylene Glycol Allowed to Remain

· There will be 1500 fires each year in the systems with antifreeze (500,000 sprinklered homes with antifreeze and 0.003 fires/home/year)
· There will be 3 deaths per year assuming that sprinklers are 90% effective and in 90% of the locations where deadly fires start (1500 fires times 0.01 deaths per fire is a potential for 15 deaths, 1.5 might occur from fires starting in unsprinklered spaces, 1.5 might occur due to some failure of the system, the other 12 will be saved)
· There will be between 0 and 0.6 deaths due to flash fires depending on the population of antifreeze solutions in homes (1500 fires times 0.0004 is 0.6, which is extremely conservative considering this statistic is gathered from high concentrations systems that were not in homes)
· Total of between 3.0 and 3.6 possible deaths per year from this decision

If We Call for Replacement/Reduction of Solutions

· Assumption that 125,000 systems (25% of existing antifreeze systems) will get turned off
· Assumption that 125,000 people (25% of existing antifreeze systems ) will comply and spend the money to do something else (lower system concentration, heat tracing or conversion to dry-pipe or preaction system)
· Assumption that 250,000 systems (50% of existing systems) will be left “as is” with whatever antifreeze they have

· The homeowners who shut off their systems will experience 375 fires and 3.75 fire deaths that can’t be prevented by a sprinkler system shut off
· The homeowners that complied will experience 375 fires and 0.75 fire deaths assuming the sprinkler systems are 90% effective and that sprinklers are installed in 90% of locations where deadly fires start
· The homeowners that left their systems “as is” will experience 750 fires and between 1.5 and 1.8 fire deaths (1.5 of the fire deaths are from the system being 90% effective and 90% of the fires starting in sprinklered spaces and up to 0.3 of the fire deaths are from the potential for a flash fire depending on the antifreeze concentrations that are assumed)
· Total of between 6.0 and 6.3 potential deaths per year from this decision

Of course, any risk analysis like this is dependent on the assumptions used to formulate the conclusions. A sensitivity analysis was performed on the assumption above that if some change was required by NFPA 13D that 25% of the systems would be shut off and only 25% of the systems would be changed to comply. If the assumption was changed to 10% of the systems being shut off and 80% of the systems being changed to comply (with the remaining 10% of the systems left “as is”) then the decision to force the change still comes out worse (with a risk between 4.2 and 4.26) than the decision to leave all of the systems alone (with a risk between 3 and 3.6).

Emergency Nature: This TIA has been prompted by the recently released interim research report, Antifreeze Solutions Supplied through Spray Sprinklers, issued by the Fire Protection Research Foundation in February of 2012. It is part of a package of TIA’s being submitted by each of the fire sprinkler installation and maintenance documents in order to address the issues raised by that research. It meets the definition of part 5.2(c) in the Regulations Governing Committee Projects as an emergency since the issues raised by the research where not known at the time the standard was being developed.
The use of propylene glycol and glycerin antifreeze solutions should only be considered when other sprinkler system design alternatives are not available or practical. If these solutions are used, all relevant data and information should be carefully reviewed and considered in design and installation of the sprinkler system.

Submitter Information Verification

Submitter Full Name: Terry Victor
Organization: Tyco/SimplexGrinnell
Submittal Date: Fri Jan 25 11:03:45 EST 2013

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Public Input No. 14-NFPA 13D-2012 [Section No. 9.3.3.2]

9.3.3.2
Water delivery shall be based on one of the following:

(1) Calculation program and method that shall be listed by a nationally recognized laboratory

(2) An inspector's test connection providing a flow equivalent to the smallest orifice sprinkler utilized or smallest K Factor utilized, wherein the test orifice is located on the end of the most distant sprinkler pipe on the most remote branchline.

Statement of Problem and Substantiation for Public Input

Modified language to correlate with NFPA 13 with the term K Factor. Made minor wording changes.

Related Public Inputs for This Document

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Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 10:25:00 EST 2012

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[By checking this box I affirm that I am Peter Schwab, and I agree to be legally bound by the above Copyright Assignment and the terms and conditions contained therein. I understand and intend that, by checking this box, I am creating an electronic signature that will, upon my submission of this form, have the same legal force and effect as a handwritten signature]
10.4.3 * Unless the pipe size is in accordance with the prescriptive pipe sizing method of 10.4.9 or in accordance with a manufacturer's published method for prescriptive pipe sizing, pipe shall be sized by hydraulic calculations in accordance with the methods described in NFPA 13, in accordance with 10.4.4, or in accordance with the following general method for straight-run systems connected to a city water main of at least 4 in. (102 mm) in diameter:

1. The system flow rate shall be established in accordance with Sections 10.1 and 10.2, and it shall be determined that the flow allowed by the water meter meets or exceeds the system demand and that the total demand flow does not exceed the maximum flow allowed by the piping system components.

2. The water pressure in the street shall be determined.

3. Pipe sizes shall be selected.

4. Pressure loss for a water meter, if any, shall be determined and deducted using one of the following:

5. Table 10.4.3(a) shall be permitted to be used, even where the sprinkler demand flow exceeds the meter's rated continuous flow.

6. Higher pressure losses specified by the manufacturer shall be used in place of those specified in Table 10.4.3(a).

7. Lower pressure losses shall be permitted to be used where supporting data are provided by the meter manufacturer.

8. Pressure loss for elevation shall be deducted as follows:
   (a) Building height above street (ft) × 0.433 = pressure loss (psi)
   (b) Building height above street (m) × 0.098 = pressure loss (bar)

9. Pressure losses from the city main to the inside control valve shall be deducted by multiplying the pressure loss associated with the pipe material by the total length(s) of pipe in feet (meters).

10. Pressure loss for piping within the building shall be deducted by multiplying the pressure loss associated with the pipe material by the total length(s) of pipe in feet (meters).

11. Pressure loss for valves and fittings shall be deducted as follows:
   (a) The valves and fittings from the control valve to the farthest sprinkler shall be counted.
   (b) The equivalent length for each valve and fitting as shown in Table 10.4.3(b), Table 10.4.3(c), or Table 10.4.3(d) or Table 10.4.3(e) shall be determined and the values added to obtain the total equivalent length for each pipe size.
   (c) The equivalent length for each size shall be multiplied by the pressure loss associated with the pipe material and the values totaled.

12. In multilevel buildings, the steps in 10.4.3 (1) through 10.4.3 (8) shall be repeated to size piping for each floor.

13. If the remaining pressure is less than the operating pressure established by the testing laboratory for the sprinkler being used, the sprinkler system shall be redesigned.

14. If the remaining pressure is higher than required, smaller piping shall be permitted to be used where justified by calculations.
The remaining piping shall be sized the same as the piping up to and including the farthest sprinkler unless smaller pipe sizes are justified by calculations.

Table 10.4.3(a) Pressure Losses in psi in Water Meters

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<tr>
<th>Meter Size (in.)</th>
<th>Flow (gpm)</th>
<th>18 or less</th>
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For SI units, 1 gpm = 3.785 L/min; 1 in. = 25.4 mm; 1 psi = 0.0689 bar.

*Above maximum rated flow of commonly available meters.

**Table 10.4.3(b) Equivalent Length in Feet of Fittings and Valves for Schedule 40 Steel Pipe**

<table>
<thead>
<tr>
<th>Diameter (in.)</th>
<th>45 Degree Elbow</th>
<th>90 Degree Elbow</th>
<th>Long-Radius Elbow</th>
<th>Tee or Cross (flow turned 90 degrees)</th>
<th>Tee or Cross (flow straight through)</th>
<th>Gate Valve</th>
<th>Angle Valve</th>
<th>Globe Valve</th>
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For SI units, 1 in. = 25.4 mm; 1 ft = 0.3048 m.

**Table 10.4.3(c) Equivalent Length in Feet of Fittings and Valves for Type K Copper Tube**

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<tr>
<th>Diameter (in.)</th>
<th>45 Degree Elbow</th>
<th>90 Degree Elbow</th>
<th>Long-Radius Elbow</th>
<th>Tee or Cross (flow turned 90 degrees)</th>
<th>Tee or Cross (flow straight through)</th>
<th>Gate Valve</th>
<th>Angle Valve</th>
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For SI units, 1 in. = 25.4 mm; 1 ft = 0.3048 m.

**Table 10.4.3(d) Equivalent Length in Feet of Fittings and Valves for Type L Copper Tube**

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<th>Tee or Cross (flow straight)</th>
<th>Gate Valve</th>
<th>Angle Valve</th>
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<td>28</td>
<td>66</td>
<td>33</td>
<td>8</td>
<td>13</td>
</tr>
</tbody>
</table>

For SI units, 1 in. = 25.4 mm; 1 ft = 0.3048 m.
Statement of Problem and Substantiation for Public Input

Adding this language would allow sizing fire sprinkler piping based on published prescriptive pipe sizing by pipe manufacturers. This would allow prescriptive pipe sizing for systems utilizing specially listed piping products when the tables supporting the calculation procedure of 10.4.9.2 do not cover the available sizes or are otherwise not appropriate.

Submitter Information Verification

Submitter Full Name: Eric Skare
Organization: Uponor, Inc.
Submittal Date: Wed May 29 15:44:29 EDT 2013

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For SI units, 1 in. = 25.4 mm; 1 ft = 0.3048 m.

Table 10.4.3(e) Equivalent Length in Feet of Fittings and Valves for Type M Copper Tube

<table>
<thead>
<tr>
<th>Diameter (in.)</th>
<th>45 Degree Elbow</th>
<th>90 Degree Elbow</th>
<th>Long-RADIUS Elbow</th>
<th>90 degrees</th>
<th>45 Degree Elbow</th>
<th>90 Degree Elbow</th>
<th>Long-Radius Elbow</th>
<th>Tee or Cross (flow turned 90 degrees)</th>
<th>Tee or Cross (flow straight through)</th>
<th>Gate Angle Valve</th>
<th>Globe Angle Valve</th>
<th>Globe &quot;Y&quot; Pattern Valve</th>
<th>Cock Valve</th>
<th>Check Valve</th>
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</thead>
<tbody>
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<td>8</td>
</tr>
<tr>
<td>1 1/4</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>7</td>
<td>2</td>
<td>0</td>
<td>16</td>
<td>38</td>
<td>20</td>
<td>5</td>
<td>5</td>
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<td>5</td>
</tr>
<tr>
<td>1 1/2</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>9</td>
<td>3</td>
<td>0</td>
<td>21</td>
<td>50</td>
<td>26</td>
<td>7</td>
<td>7</td>
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<tr>
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<td>3</td>
<td>7</td>
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<td>13</td>
<td>5</td>
<td>1</td>
<td>32</td>
<td>75</td>
<td>37</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
</tbody>
</table>
10.4.9.2 **Calculation Procedure.**

Determination of the required size for water distribution piping shall be in accordance with the following procedure:

1. **Step 1 — Determine \( P_{\text{sup}} \)**. Obtain the static supply pressure that will be available from the main water main from the water purveyor or from a private source, such as a tank system, a private well system, or a combination of these. For a private source, the available water supply pressure shall be based on the minimum pressure control setting for the pump.

2. **Step 2 — Determine \( PL_{\text{svc}} \)**. Use Table 10.4.9.2(a) to determine the pressure loss in the water service pipe based on the selected size of the water service.

3. **Step 3 — Determine \( PL_{m} \)**. Use Table 10.4.3(a) to determine the pressure loss from the water meter based on the selected water meter size. Where the actual water meter pressure loss is known, \( PL_{m} \) shall be the actual loss.

4. **Step 4 — Determine \( PL_{d} \)**. Determine the pressure loss from devices, other than the water meter, installed in the piping system supplying sprinklers, such as pressure-reducing valves, backflow preventers, water softeners, or water filters.
   - (a) Device pressure losses shall be based on the device manufacturer’s specifications.
   - (b) The flow rate used to determine pressure loss shall be the rate from Section 10.1, except that 5 gpm (19 L/min) shall be added where the device is installed in a water service pipe that supplies more than one dwelling.
   - (c) As an alternative to deducting pressure loss for a device, an automatic bypass valve shall be installed to divert flow around the device when a sprinkler activates.

5. **Step 5 — Determine \( PL_{\theta} \)**. Use Table 10.4.9.2(b) to determine the pressure loss associated with changes in elevation. The elevation used in applying the table shall be the difference between the elevation where the water source pressure was measured and the elevation of the highest sprinkler.

6. **Step 6 — Determine \( PL_{sp} \)**. Determine the maximum pressure required by any individual sprinkler based on the following:
   - (a) The area of coverage
   - (b) The ceiling configuration
   - (c) The temperature rating
   - (d) Any additional conditions specified by the sprinkler manufacturer
   The required pressure is provided in the sprinkler manufacturer’s published data for the specific sprinkler model based on the selected flow rate.

7. **Step 7 — Calculate \( PL_{t} \)**. Using the equation in 10.4.9.1, calculate the pressure available to offset friction loss in water distribution piping between the service valve and the sprinklers.

8. **Step 8 — Determine the maximum allowable pipe length.** Use Table 10.4.9.2(c) through Table 10.4.9.2(h) to select a material and size for water distribution piping. The piping material and size shall be acceptable if the developed length of pipe
between the service valve and the most remote sprinkler does not exceed the maximum allowable length specified by the applicable table. Interpolation of \( P_t \) between the tabular values shall be permitted.

Table 10.4.9.2(a) Water Service Pressure Loss (PLsvc)

<table>
<thead>
<tr>
<th>Flow Rate* (gpm)</th>
<th>( \frac{3}{4} ) in. Water Service Pressure Loss (psi)</th>
<th>1 in. Water Service Pressure Loss (psi)</th>
<th>( \frac{1}{4} ) in. Water Service Pressure Loss (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40 ft or less</td>
<td>41 ft to 75 ft</td>
<td>76 ft to 100 ft</td>
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<tr>
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<td>8.7</td>
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<td>24.9</td>
</tr>
<tr>
<td>14</td>
<td>14.4</td>
<td>24.5</td>
<td>NP</td>
</tr>
<tr>
<td>16</td>
<td>18.4</td>
<td>NP</td>
<td>NP</td>
</tr>
<tr>
<td>18</td>
<td>22.9</td>
<td>NP</td>
<td>NP</td>
</tr>
<tr>
<td>20</td>
<td>27.8</td>
<td>NP</td>
<td>NP</td>
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<tr>
<td>22</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
</tr>
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<td>NP</td>
<td>NP</td>
<td>NP</td>
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<tr>
<td>26</td>
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<td>32</td>
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<td>NP</td>
<td>NP</td>
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<tr>
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<td>NP</td>
<td>NP</td>
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<tr>
<td>36</td>
<td>NP</td>
<td>NP</td>
<td>NP</td>
</tr>
</tbody>
</table>

NP: Not permitted. Pressure loss exceeds reasonable limits.

Notes:

(1) Values are applicable for underground piping materials permitted by the local plumbing code and are based on an SDR of 11 and a Hazen-Williams \( C \) factor of 150.

(2) Values include the following length allowances for fittings: 25 percent length increase for actual lengths up to 100 ft and 15 percent length increase for actual lengths over 100 ft.

*Flow rate from Sections 10.1 and 10.2. Add 5 gpm to the flow rate required by 10.4.9.2, Step 4, where the water service pipe supplies more than one dwelling.

Table 10.4.9.2(b) Elevation Loss (PLe)

<table>
<thead>
<tr>
<th>Elevation (ft)</th>
<th>Pressure Loss (psi)</th>
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<td>2.2</td>
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<tr>
<td>10</td>
<td>4.4</td>
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<td>40</td>
<td>17.4</td>
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</tbody>
</table>

Table 10.4.9.2(c) Allowable Pipe Length for in. Type M Copper Water Tubing
<table>
<thead>
<tr>
<th>Sprinkler Flow Rate* (gpm)</th>
<th>Water Distribution Size (in.)</th>
<th>Available Pressure, ( P_{\text{t}} ) (psi)</th>
<th>Allowable Length of Pipe from Service Valve to Farthest Sprinkler (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>15  20  25  30  35  40  45  50  55  60</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>3/4</td>
<td>806 1075 1343 1612 1881 2149 2418 2687 2955 3224</td>
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</tr>
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<td>1</td>
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</tr>
</tbody>
</table>

NP: Not permitted.

*Flow rate from Sections 10.1 and 10.2.

Table 10.4.9.2(d) Allowable Pipe Length for 1 in. Type M Copper Water Tubing
<table>
<thead>
<tr>
<th>Sprinkler Flow Rate* (gpm)</th>
<th>Water Distribution Size (in.)</th>
<th>Available Pressure, $P$ (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Allowable Length of Pipe from Service Valve to Farthest Sprinkler (ft)</td>
</tr>
<tr>
<td>8</td>
<td>$\frac{3}{4}$</td>
<td>348</td>
</tr>
<tr>
<td>9</td>
<td>$\frac{3}{4}$</td>
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</tr>
<tr>
<td>10</td>
<td>$\frac{3}{4}$</td>
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<td>193</td>
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<tr>
<td>12</td>
<td>$\frac{3}{4}$</td>
<td>165</td>
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<tr>
<td>13</td>
<td>$\frac{3}{4}$</td>
<td>142</td>
</tr>
<tr>
<td>14</td>
<td>$\frac{3}{4}$</td>
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<td>97</td>
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<tr>
<td>17</td>
<td>$\frac{3}{4}$</td>
<td>86</td>
</tr>
</tbody>
</table>

*Flow rate from Sections 10.1 and 10.2.

Table 10.4.9.2(e) Allowable Pipe Length for in. CPVC Pipe (IPS) Pipe
<table>
<thead>
<tr>
<th>Sprinkler Flow Rate* (gpm)</th>
<th>Water Distribution Size (in.)</th>
<th>Available Pressure, $P \cdot t$ (psi)</th>
<th>Allowable Length of Pipe from Service Valve to Farthest Sprinkler (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td>694</td>
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<td>427</td>
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*Flow rate from Sections 10.1 and 10.2.

Table 10.4.9.2(f) Allowable Pipe Length for 1 in. CPVC Pipe (IPS) Pipe
Table 10.4.9.2(g) Allowable Pipe Length for in. PEX Tubing

<table>
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<th>Sprinkler Flow Rate* (gpm)</th>
<th>Water Distribution Size (in.)</th>
<th>Allowable Pressure, $P_{t1}$ (psi)</th>
<th>15</th>
<th>20</th>
<th>25</th>
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*Flow rate from Sections 10.1 and 10.2.
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<th>Water Distribution Size (in.)</th>
<th>Allowable Pressure, $P$, $f$ (psi)</th>
<th>Allowable Length of Pipe from Service Valve to Farthest Sprinkler (ft)</th>
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NP: Not permitted.

*Flow rate from Sections 10.1 and 10.2.

Table 10.4.9.2(h) Allowable Pipe Length for 1 in. PEX Tubing

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<th>Allowable Length of Pipe from Service Valve to Farthest Sprinkler (ft)</th>
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</table>

$^*$ Flow rate from Sections 10.1 and 10.2.

NP: Not permitted.
Statement of Problem and Substantiation for Public Input

I am not sure which CPVC pipe was used in the calculations for these tables. There is a pretty substantial difference in internal diameters from IPS (Iron Pipe Size) CPVC and CTS (Copper Tubing Size) CPVC. The title of this table should delineate which type of CPVC it refers to.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 10:31:40 EST 2012

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Public Input No. 17-NFPA 13D-2012 [ New Section after 12.3.2 ]

TITLE OF NEW CONTENT: Spare Sprinkler

Type your content here ...

"One spare sprinkler and escutcheon shall be provided and placed at the inspector's test/shutoff valve, attached to the pipe in a plastic baggie, in the event a sprinkler activates and for use by the responding Engine Company, or home owner."

Personal comment: The city I worked for had a large development of 3 story townhomes built. Although there is no requirement in NFPA 13D for any spare heads to be provided, I was not allowed to "require" any and wrote a statement to the GC that I strongly recommended at least one be provided. Last summer I received a call from one of our Division Chiefs wanting to know where the spare head cabinet was located. There had been a fire in one of the townhomes, a head discharged and all I could provide the Chief with was my letter.

Providing at least one spare sprinkler head, limits down time of the entire water supply to the residence in the event of an accidental activation, or single head activation by fire and, IMHO, is common sense. I understand that there is currently a dual feed valve box some cities are proposing that would alleviate shutting down the entire residence, but am not aware of it being utilized by jurisdictions since the entire meter would require replacing with the dual.

Statement of Problem and Substantiation for Public Input

Statement included on proposed addition page.

Submitter Information Verification

Submitter Full Name: MICHAEL KESZENHEIMER
Organization: CITY OF TRACY Retired Fire Inspector
Submittal Date: Thu Dec 13 16:19:19 EST 2012

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A.3.3.6 Premixed Antifreeze Solution.
Where a tank is used as the water supply for the sprinkler system, the tank is not permitted to be filled with antifreeze.

Statement of Problem and Substantiation for Public Input

Antifreeze solutions are required to be listed. One of the listing requirements is that the liquid is not flammable. Since NFPA 13D only has a 10 minute (7 minute in certain circumstances) water supply, the total amount of solution that would be needed to satisfy the system demand is reasonable. The standard should allow for this option to use a tank full of antifreeze for new systems.

Related Public Inputs for This Document

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Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 09:37:40 EST 2012

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/TerraView/Content/13D-2013.ditamap/2/C1355236660917.xml
The connection to city mains for fire protection is often subject to local regulation of metering and backflow prevention requirements. Preferred and acceptable water supply arrangements are shown in Figure A.6.2(a), Figure A.6.2(b), and Figure A.6.2(c). Where it is necessary to use a meter between the city water main and the sprinkler system supply, an acceptable arrangement as shown in Figure A.6.2(a), Figure A.6.2(b) and Figure A.6.2(c) can be used. Under these circumstances, the flow characteristics of the meter are to be included in the hydraulic calculation of the system. Where a tank is used for both domestic and fire protection purposes, a low water alarm that actuates when the water level falls below 110 percent of the minimum quantity specified in Section 6.1.2 should be provided.

The effect of pressure-reducing valves on the system should be considered in the hydraulic calculation procedures.

Figure A.6.2(a) is the preferred method, Figure A.6.2(b) or Figure A.6.2(c) are preferred methods for getting the water supply into the unit for a stand-alone sprinkler system (one that does not also provide direct connections to the cold water fixtures) because the common supply pipe for the domestic system and the sprinkler system between the water supply and the dwelling unit has a single control valve that shuts the sprinkler system, which helps to ensure that people who have running water to their domestic fixtures also have fire protection. This serves as a form of supervision for the control valve and can be used to make sure that the valve stays open in place of other, more expensive options such as tamper switches with a monitoring service.

Some water utilities insist on separate taps and supply pipes from the water supply to the dwelling unit for fire sprinkler systems as shown in Figure A.6.2(b-d), due to concerns about shutting off the water supply for nonpayment of bills and the desire not to shut off fire protection if this ever occurs. An alternative to separate taps is shown in Figure A.6.2(c), which provides a separate stop for domestic lockout. While these types of arrangements are acceptable, they may not be cost efficient and should be discouraged due to the extra cost burden this places on the building owner. The concern over shutting off the water for nonpayment of bills is a nonissue for a number of reasons. First, the water utilities rarely actually shut off water for nonpayment. Second, if they do shut off water for nonpayment, they are creating violations of all sorts of health and safety codes, allowing people to live in a home without running water. Concern over the fire protection for those individuals when they are violating all kinds of other health codes is disingenuous. More likely, the water utility will not shut off the water and will follow other legal avenues to collect on unpaid bills, such as liens on property. Millions of people should not have to pay hundreds of millions of dollars to install separate water taps and lines for the few services that might get shut off.

Figure A

Insert new Figures A.6.2(a)

Preferable Arrangement for Stand Alone Piping Systems:
Figure A.6.2(b) Acceptable Arrangement for Stand-Alone Piping Systems with Valve Supervision — Option 1:

Figure A.6.2(c) Acceptable Arrangement for Stand-Alone Piping Systems with Valve Supervision — Option 2:

(e) Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

The existing water supply sketches are dated, do not use contemporary and standard plumbing industry references for water service piping, and include components of the sprinkler service that are either optional or not required. The proposed changes to this section are intended to broaden the range of acceptable arrangements and to better reflect current practices.

Submitter Information Verification

Submitter Full Name: Stephen Leyton
Organization: Protection Design and Consulting
Affiliation: American Fire Sprinkler Association
Submittal Date: Thu Apr 18 10:48:29 EDT 2013

---

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---

Public Input No. 51-NFPA 13D-2013 [ New Section after A.7.6 ]
Note: This Proposal originates from Tentative Interim Amendment 13D-10-3 (TIA 1028R) issued by the Standards Council on August 11, 2011.

A.8.1.2.3 A number of variables exist that would influence the number of sprinklers that might open during a fire. In many of the fire tests that led to the development of the residential sprinkler, and in many of the subsequent tests including the testing conducted as a part of the previously referenced FPRF sloped ceiling research project, more than two sprinklers have opened during certain fire tests, but the water supply, sized for only two sprinklers, was still capable of controlling the fire for ten minutes and meeting the goals of NFPA 13D. While there is no guarantee that this would always happen, it is believed that the two sprinkler design criteria is appropriate for ceiling constructions and room configurations that are within the limitations referenced 8.1.2.1 and 8.1.2.2. For the ceiling constructions and room configurations that are beyond the scope of the two-sprinkler discharge criteria referenced in 8.1.2.1 and 8.1.2.2, a greater number of design sprinklers and/or higher discharge flows should be considered in the system design. As of this date, there is limited fire test data available to include specific design criteria in this standard. In these situations, sprinklers can be installed in a manner acceptable to the authority having jurisdiction to achieve the results specified in this standard. In making these determinations, consideration should be given to factors influencing sprinkler system performance, such as sprinkler response characteristics, impact of obstructions on sprinkler discharge, and number of sprinklers anticipated to operate in the event of a fire. For the situation of flat, smooth, horizontal ceilings with beams at the ceiling, there are a number of variables that could cause many sprinklers to open during a fire. Residential sprinklers used in accordance with all of the restrictions of their listing can be used to protect this circumstance.

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

This proposed language is based upon the findings of the Fire Protection Research Foundation’s project on residential sprinklers and sloped and beamed ceilings into NFPA 13D. The limitations of the test facility have been translated into limitations on the generic use of residential sprinklers. The maximum ceiling height of 24 ft. and limitation on communicating spaces considers the data generated under the FPRF project as well as other fire tests conducted at other times. This same language was accepted by the Technical Committee as proposal 13D-67 Log #CP9 at the A2012 ROP meeting. Please see the attached FPRF Report for the technical substantiation supporting this language.

Emergency Nature: The information provided in the FPRF report was not available to the technical committees during the development of the 2010 edition. The absence of information of this type contributed to the lack of direction on this subject within the document. Lack of clear guidance from the committee on these issues significantly drives up the installed cost of residential sprinkler systems. These cost increases have been referenced by certain jurisdictions as reasons they have chosen not to adopt or have repealed existing residential sprinkler ordinances within their communities and is the reason this amendment is emergency in nature.

Submitter Information Verification

Submitter Full Name: James Golinveaux
Organization: Tyco Fire Suppression & Building Products
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Public Input No. 52-NFPA 13D-2013 [ New Section after A.7.6 ]

Note: This Proposal originates from Tentative Interim Amendment 13D-10-3 (TIA 1028R) issued by the Standards Council on August 11, 2011.

A.8.1.2 All residential sprinklers have been investigated under a flat, smooth, 8 ft (2.4 m) high horizontal ceiling. Some residential sprinklers have been investigated and listed for use under specific ceiling configurations such as a horizontal beamed ceiling. The performance of residential sprinklers under flat, smooth, horizontal ceilings has been well documented throughout the life of NFPA 13D. Prior to 2010, several manufacturers of residential sprinklers had performed testing and received listings for residential sprinklers under certain slopes and in certain beam conditions. In 2010, the Fire Protection Research Foundation (FPRF) conducted a research project consisting of 76 FDS simulations and 12 full-scale fire tests. The results have been used to develop system design criteria in a generic manner in order to simplify the use of residential sprinklers. Some residential sprinkler listings still exist for situations beyond the scope of the generic design. See the FPRF report, Analysis of the Performance of Residential Sprinkler Systems with Sloped or Sloped and Beamed Ceilings, dated July 2010, for more information. Questions are frequently asked regarding the minimum two-sprinkler design when certain sprinkler performance statistics have indicated that in a majority of the cases (with residential sprinklers) the fire is controlled or suppressed with a single sprinkler. While these statistics may or may not be accurate, the water supplies for the fire sprinkler systems under which these statistics were generated were designed for two or more sprinklers in the first place. When the fires occurred, the first sprinkler operated in excess of its individual design flow and pressure because the sprinkler system

Additional Proposed Changes

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This proposed language is based upon the findings of the Fire Protection Research Foundation’s project on residential sprinklers and sloped and beamed ceilings into NFPA 13D. The limitations of the test facility have been translated into limitations on the generic use of residential sprinklers. The maximum ceiling height of 24 ft. and limitation on communicating spaces considers the data generated under the FPRF project as well as other fire tests conducted at other times. This same language was accepted by the Technical Committee as proposal 13D-67 Log #CP9 at the A2012 ROP meeting. Please see the attached FPRF Report for the technical substantiation supporting this language.

Emergency Nature: The information provided in the FPRF report was not available to the technical committees during the development of the 2010 edition. The absence of information of this type contributed to the lack of direction on this subject within the document. Lack of clear guidance from the committee on these issues significantly drives up the installed cost of residential sprinkler systems. These cost increases have been referenced by certain jurisdictions as reasons they have chosen not to adopt or have repealed existing residential sprinkler ordnances within their communities and is the reason this amendment is emergency in nature.

Submitter Information Verification

Submitter Full Name: James Golinveaux
Organization: Tyco Fire Suppression & Building Products
Submittal Date: Mon Jun 17 12:48:05 EDT 2013

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COMBINED DOMESTIC/FIRE SERVICE WITH COMMON METER

- Drain (and test connection if Alarm Req'd)
- Pressure Gauge (if Req'd)
- Waterflow Detection (if Req'd)
- To Domestic System
- Domestic Shutoff Valve System
- Main Shutoff Valve (Private)
- Water Meter
- Meter Stop (Public)
- Corporation Stop (if Req'd)
- City Water Main
- To Fire Sprinklers
- Check Valve or Backflow Prevention Device as Required
Preferable Arrangement for Stand-Alone Piping Systems

- Domestic Shutoff Valve System
- Water Meter
- Shutoff Valve

To Domestic

To Fire Sprinklers

Drain (and Test Connection if Alarm Required)

(T if Red)

Waterflow Detector

Pressure Gauge

Prevention Aplpliance if Required

Check Valve or Backflow

Corporation Stop (T if Red)

City Water Main
COMBINED DOMESTIC/FIRE SERVICE WITH LOCKOUT

- Drain and Test Connection if Alarm (if red)
- Pressure Gauge
- Waterflow Detector (if red)
- Water Purifier Lockout
- Water Meter
- Meter Stop (Public)
- Corporation Stop (if red)
- Check Valve or Backflow Prevention Appliance if Required
- City Water Main
ACCEPTABLE ARRANGEMENT FOR STAND-ALONE
PIPING SYSTEMS WITH VALVE SUPERVISION - OPTION 1

DRAIN (AND TEST CONNECTION IF ALARM REQ'D)

PREVENTION APPLIANCE (IF REQUIRED)

CHECK VALVE OR BACKFLOWS

PRESSURE GAUGE

CURB STOP OR SHUTOFF VALVE

CORPORATION STOP (IF REQ'D)

CITY WATER MAIN

WATER FLOW DETECTOR

DOMESTIC SHUTOFF VALVE SYSTEM

METER STOP (PUBLIC)

WATER METER

CORPORATION STOP (IF REQ'D)

TO FIRE SPRINKLERS

TO DOMESTIC
Public Input No. 50-NFPA 13D-2013 [ Section No. A.8.1.3.1.2 ]

A.8.1.3.1.2

See A. 40.8.1.2 and A. 8.1.2.3

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

Note: This Proposal originates from Tentative Interim Amendment 13D-10-3 (TIA 1028R) issued by the Standards Council on August 11, 2011.

This proposed language is based upon the findings of the Fire Protection Research Foundation’s project on residential sprinklers and sloped and beamed ceilings into NFPA 13D. The limitations of the test facility have been translated into limitations on the generic use of residential sprinklers. The maximum ceiling height of 24 ft. and limitation on communicating spaces considers the data generated under the FPRF project as well as other fire tests conducted at other times. This same language was accepted by the Technical Committee as proposal 13D-67 Log #CP9 at the A2012 ROP meeting. Please see the attached FPRF Report for the technical substantiation supporting this language.

Emergency Nature: The information provided in the FPRF report was not available to the technical committees during the development of the 2010 edition. The absence of information of this type contributed to the lack of direction on this subject within the document. Lack of clear guidance from the committee on these issues significantly drives up the installed cost of residential sprinkler systems. These cost increases have been referenced by certain jurisdictions as reasons they have chosen not to adopt or have repealed existing residential sprinkler ordinances within their communities and is the reason this amendment is emergency in nature.

Submitter Information Verification

Submitter Full Name: James Golinveaux
Organization: Tyco Fire Suppression & Building Products
Submittal Date: Mon Jun 17 12:42:54 EDT 2013

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A.8.2.5

The objective is to position sprinklers so that the response time and discharge are not unduly affected by obstructions such as ceiling slope, beams, light fixtures, or ceiling fans. The rules in this section, while different from the obstruction rules of NFPA 13 provide a reasonable level of life safety while maintaining the philosophy of keeping NFPA 13D relatively simple to apply and enforce.

Fire testing has indicated the need to wet walls in the area protected by residential sprinklers at a level closer to the ceiling than that accomplished by standard sprinkler distribution. Where beams, light fixtures, sloped ceilings, and other obstructions occur, additional residential sprinklers are necessary to achieve proper response and distribution. In addition, for sloped ceilings, higher flow rates could be needed. Guidance should be obtained from the manufacturer.

A series of 33 full-scale tests were conducted in a test room with a floor area of 12 ft × 24 ft (3.6 m × 7.2 m) to determine the effect of cathedral (sloped) and beamed ceiling construction, and combinations of both, on fast-response residential sprinkler performance. The testing was performed using one pendent-type residential sprinkler model, two ceiling slopes (0 degrees and 14 degrees), and two beam configurations on a single enclosure size. In order to judge the effectiveness of sprinklers in controlling fires, two baseline tests, in which the ceiling was smooth and horizontal, were conducted with the pendent sprinklers installed and with a total water supply of 26 gpm (98 L/min) as required by this standard. The results of the baseline tests were compared with tests in which the ceiling was beamed or sloped, or both, and two pendent sprinklers were installed with the same water supply. Under the limited conditions used for testing, the comparison indicates that sloped or beamed ceilings, or a combination of both, represent a serious challenge to the fire protection afforded by fast-response residential sprinklers. However, further tests with beamed ceilings indicated that fire control equivalent to that obtained in the baseline tests can be obtained where one sprinkler is centered in each bay formed by the beams and a total water supply of 36 gpm (136 L/min) is available. Fire control equivalent to that obtained in the baseline tests was obtained for the smooth, sloped ceiling tests where three sprinklers were installed with a total water supply of 54 gpm (200 L/min). In a single smoldering-started fire test, the fire was suppressed.

Small areas created by architectural features such as planter box windows, bay windows, and similar features can be evaluated as follows:

1. Where no additional floor area is created by the architectural feature, no additional sprinkler protection is required.
2. Where additional floor area is created by an architectural feature, no additional sprinkler protection is required, provided all of the following conditions are met:
   3. The floor area does not exceed 18 ft² (1.7 m²).
   4. The floor area is not greater than 2 ft (0.65 m) in depth at the deepest point of the architectural feature to the plane of the primary wall where measured along the finished floor.
   5. The floor area is not greater than 9 ft (2.9 m) in length where measured along the plane of the primary wall.

Measurement from the deepest point of the architectural feature to the sprinkler should not exceed the maximum listed spacing of the sprinkler. The hydraulic design is not
required to consider the area created by the architectural feature.

Where the obstruction criteria established by this standard are followed, sprinkler spray patterns will not necessarily get water to every square foot of space within a room. As such, a sprinkler in a room with acceptable obstructions as outlined in this standard might not be capable of passing the fire test (specified by ANSI/UL 1626, *Residential Sprinklers for Fire-Protection Service*, and other similar laboratory standards) if the fire is started in one of these dry areas. This occurrence is not to be interpreted as a failure of the sprinkler. The laboratory fire tests are sufficiently challenging to the sprinkler without additional obstructions as a safety factor to account for the variables that actually occur in dwellings, including acceptable obstructions to spray patterns.

The rules on 8.2.5.2 and 8.2.5.3 were developed from a testing series conducted by the National Fire Sprinkler Association and The Viking Corporation that included fire modeling, sprinkler response tests, sprinkler distribution tests, and full-scale fire tests (Valentine and Isman, *Interaction of Residential Sprinklers, Ceiling Fans and Similar Obstructions*, National Fire Sprinkler Association, November 2005). This test series, along with additional industry experience, shows that a difference exists between obstructions that are tight to the ceiling and obstructions that hang down from the ceiling, allowing spray over the top. Residential sprinklers require high wall wetting, which means that they tend to spray over obstructions that hang down from the ceiling. The test series showed that the fan blades were not significant obstructions and that as long as the sprinkler was far enough from the fan motor housing (measured from the center of the housing), the sprinkler could control a fire on the other side of the fan in a small room. In larger rooms, the sprinkler will need to be augmented by additional sprinklers on the other side of the fan. The test series showed that the fan on low or medium speed did not make a significant difference in sprinkler performance. On high speed (pushing air down), the fan did impact sprinkler performance, but fire control was still achieved in small rooms. In larger rooms, it is expected that additional sprinklers would be installed. The test series also showed that the fan blowing down was more significant than the fan pulling air up.

The rules in 8.2.5.6 were developed from years of experience with obstruction rules and an additional test series conducted by the National Fire Sprinkler Association with the help of Tyco International (Valentine and Isman, *Kitchen Cabinets and Residential Sprinklers*, National Fire Sprinkler Association, November 2005), which included fire modeling, distribution tests, and full-scale fire tests. The test series showed that pendent sprinklers definitely provide protection for kitchens, even for fires that start under the cabinets. The information in the series was less than definitive for sidewall sprinklers, but distribution data show that sprinklers in the positions in this standard provide adequate water distribution in front of the cabinets and that sidewall sprinklers should be able to control a fire that starts under the cabinets. When protecting kitchens or similar rooms with cabinets, the pendent sprinkler should be the first option. If pendent sprinklers cannot be installed, the next best option is a sidewall sprinkler on the opposite wall from the cabinets, spraying in the direction of the cabinets. The third best option is the sidewall sprinkler on the same wall as the cabinets on a soffit flush with the face of the cabinet. The last option should be putting sprinklers on the wall back behind the face of the cabinet because this location is subject to being blocked by items placed on top of the cabinets. It is not the intent of the committee to require sprinklers to be installed under kitchen cabinets.

Statement of Problem and Substantiation for Public Input

This annex material was removed by the "Accept in Principle" committee action during the last revision cycle. Unfortunately, the committee action also significantly revised the original proposal that would have placed this language in the standard. This has created a situation where these types of architectural features are no longer referenced in the standard or the annex material, thereby causing local interpretations and confusion. In essence, this proposal reverses part 3 of the committee action on Proposal 13D-70 Log #93 for the 2010 Edition.
Submittor Information Verification

Submitter Full Name: Eric Skare
Organization: Uponor, Inc.
Submittal Date: Wed May 29 16:09:44 EDT 2013

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Public Input No. 42-NFPA 13D-2013 [ Section No. A.8.2.5.7 ]
Corridors being protected with sidewall sprinklers will frequently have small areas behind the sprinklers that are inset for a doorway. Even though these areas are slightly behind the sprinklers, it is not the intent of NFPA 13D to require additional sprinkler protection in these doorways.

Examples of shadow areas are provided in Figure A.8.2.5.7(a) and Figure A.8.2.5.7(b). The obstruction shown in Figure A.8.2.5.7(a) is a vertical obstruction in a room similar to a column. Sprinkler response and water distribution tests have been conducted on such obstructions and the data shows that the size of the obstruction as well as the size of the compartment are critical variables to sprinkler response. A larger shadow area can be acceptable in a smaller compartment. The obstruction shown in Figure A.8.2.5.7(b) is a bump out of a wall. Sprinkler response and water distribution tests have shown that this type of obstruction is not a problem.

Figure A.8.2.5.7(a) Example of Shadow Areas (SSU/SSP).

Figure A.8.2.5.7(b) Example of Shadow Areas (HSW).

**Additional Proposed Changes**

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<td>This is the second of the data reports referred to in the</td>
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Statement of Problem and Substantiation for Public Input

Sprinkler response and water distribution tests have been done on a variety of shadow area situations. The column issue is the most difficult to deal with. Various size columns and compartments produce differing results. With a large (24 inch) column and a large compartment, the sprinkler may not open in time to control a fire behind the column. With the bump out situation, there was good sprinkler response and coverage.

Submitter Information Verification

Submitter Full Name: Roland Asp
Organization: National Fire Sprinkler Association
Affiliation: NFSA E&S Committee
Submittal Date: Fri May 24 14:32:10 EDT 2013

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Public Input No. 23-NFPA 13D-2013 [ Sections A.9.2.1, A.9.2.2, A.9.2.2.2, A.9.2.2.2.1, A.9.2.2.4 ]

Antifreeze solutions can be used for maintaining automatic sprinkler protection in small, unheated areas. Antifreeze solutions are recommended only for systems not exceeding 40 gal (151 L).

Because of the cost of refilling the system or replenishing small leaks, small, dry valves should be used where more than 40 gal (151 L) are to be supplied.

Propylene glycol or other suitable material can be used as a substitute for priming water to prevent evaporation of the priming fluid and thus reduce ice formation within the system.
A.9.2.2
Listed nonmetallic sprinkler pipe and fittings should be protected from freezing with an antifreeze solution that is compatible with the nonmetallic material. Laboratory testing shows that glycol-based antifreeze solutions present a chemical environment detrimental to nonmetallic pipe.

A.9.2.2.2
Examples of specific areas might include piping installed in an exterior wall or an unheated concealed space above a cathedral ceiling that cannot be protected with insulation or heat tracing. Premixed solutions of glycerine and propylene glycol should be used only where other freeze protection options are not practical. The specific areas protected by premixed glycerine and propylene glycol shall be limited to the greatest extent possible.

Propylene glycol and glycerine antifreeze solutions discharged from sprinklers have the potential to ignite under certain conditions. Research testing has indicated that several variables can influence the potential for large-scale ignition of the antifreeze solution discharged from a sprinkler. These variables include, but are not limited to, the concentration of antifreeze solution, sprinkler discharge characteristics, the inlet pressure at the sprinkler, the location of the fire relative to the sprinkler, and the size of the fire at the time of sprinkler discharge. Research testing also indicates that propylene glycol or glycerine solutions can be used successfully with certain other combinations of these same variables. Given the need for additional testing to further define acceptable versus unacceptable scenarios, the use of propylene glycol and glycerine antifreeze solutions should be considered only when other sprinkler system design alternatives are not practical. If these solutions are used, all relevant data and information should be carefully reviewed and considered in the sprinkler system. The following is a list of research reports that have been issued by the Fire Protection Research Foundation related to the use of antifreeze in sprinkler systems:

(1) Antifreeze Systems in Home Fire Sprinkler Systems — Literature Review and Research Plan
(2) Antifreeze Systems in Home Fire Sprinkler Systems — Phase II Final Report
(3) Antifreeze Solutions Supplied through Spray Sprinklers — Interim Report

Table A.9.2.2.2 provides an overview of the testing.

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<td>Scope of sprinklers tested</td>
<td>The following sprinklers were used during the residential sprinkler research program described in Antifreeze Systems in Home Fire Sprinkler Systems — Phase II Final Report:</td>
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<td>(1) Residential pendent style having nominal K-factors of 3.1, 4.9, and 7.4 gpm/psi$^{1/2}$</td>
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<td>(2) Residential concealed pendent style having a nominal K-factor of 4.9 gpm/psi$^{1/2}$</td>
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<td>(3) Residential sidewall style having nominal K-factors of 4.2 and 5.5 gpm/psi$^{1/2}$</td>
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<td>The following sprinklers were used during the spray sprinkler research program described in Antifreeze Solutions Supplied through Spray Sprinklers — Interim Report:</td>
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<tr>
<td></td>
<td>(2) Standard spray pendent style having nominal K-factors of 2.8, 4.2, 5.6, and 8.0 gpm/psi$^{1/2}$</td>
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<td>(3) Standard spray concealed pendent style having a nominal K-factor of 5.6 gpm/psi$^{1/2}$</td>
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(4) Standard spray upright style having a nominal K-factor of 5.6 gpm/psi\(^{1/2}\)

(5) Standard spray extended coverage pendent style having a nominal K-factor of 5.6 gpm/psi\(^{1/2}\)

**Antifreeze solution**

<50% glycerine and <40% propylene glycol antifreeze solutions: Solutions were not tested.

- **50% glycerine and 40% propylene glycol antifreeze solutions:** Large-scale ignition of the sprinkler spray did not occur in tests with sprinkler discharge onto a fire having a nominal heat release rate (HRR) of 1.4 MW. Large-scale ignition of the sprinkler spray occurred in multiple tests with sprinkler discharge onto a fire having a nominal HRR of 3.0 MW.

- **55% glycerine and 45% propylene glycol antifreeze solutions:** Large-scale ignition of the sprinkler spray occurred in tests with sprinkler discharge onto a fire having a nominal HRR of 1.4 MW.

- **>55% glycerine and >45% propylene glycol antifreeze solutions:** Large-scale ignition of the sprinkler spray occurred in tests with sprinkler discharge onto a fire having an HRR <500 kW.

- **70% glycerine and 60% propylene glycol antifreeze solutions:** Maximum antifreeze solution concentrations were tested.

**Sprinkler inlet pressure**

Large-scale ignition of the sprinkler discharge spray was not observed when the sprinkler inlet pressure was ≤50 psi for tests using 50% glycerine or 40% propylene glycol.

**Ceiling height**

When 50% glycerine and 40% propylene glycol antifreeze solutions were discharged onto fires having an HRR of 1.4 MW, no large-scale ignition of the sprinkler spray was observed with ceiling heights up to 20 ft.

When 50% glycerine and 40% propylene glycol antifreeze solutions were discharged onto fires having an HRR of 3.0 MW, large-scale ignition of the sprinkler spray was observed at a ceiling height of 20 ft.

**Fire control**

The test results described in *Antifreeze Systems in Home Fire Sprinkler Systems — Phase II Final Report* and *Antifreeze Solutions Supplied through Spray Sprinklers — Interim Report* indicated that discharging glycerine and propylene glycol antifreeze solutions onto a fire can temporarily increase the fire size until water is discharged.

As a part of the residential sprinkler research described in *Antifreeze Systems in Home Fire Sprinkler Systems — Phase II Final Report*, tests were conducted to evaluate the effectiveness of residential sprinklers to control fires involving furniture and simulated furniture. The results of those tests indicated that 50% glycerine and 40% propylene glycol antifreeze solutions demonstrated the ability to control the furniture-type fires in a manner similar to water.

For standard spray-type sprinklers, no tests were conducted to investigate the ability of those sprinklers to control the types and sizes of fires they are intended to protect.

__A.9.2.2.2.1__

The documentation should substantiate that the proposed use of premixed glycerine and propylene glycol antifreeze solutions is consistent with the FPRF testing for the specific installation parameters.

__A.9.2.2.4__

The specific gravity for any liquid can be found by taking the density of the liquid at a specific temperature and dividing it by the density of water at that same temperature. The densities of propylene glycol and glycerine can be found for a wide range of temperatures in Figure A.9.2.3.2(a) and Figure A.9.2.3.2(b).

See uploaded file.
Statement of Problem and Substantiation for Public Input

Note: This Proposal originates from Tentative Interim Amendment 13D-13-1 (TIA 1067) issued by the Standards Council on August 9, 2012.

The Technical Committee on Residential Sprinkler Systems is taking a different path in dealing with antifreeze in NFPA 13D than it has in NFPA 13R or than the Sprinkler System Installation Criteria Committee is taking with NFPA 13. This different path is fundamentally based on the fact that one- and two-family dwellings are treated differently in building codes and fire codes than other types of occupancies and in recognition of the fact that NFPA 13D has a different objective than NFPA 13R and NFPA 13.

From its inception in 1975, NFPA 13D has been less stringent than NFPA 13 in order to present a document that balances the issues of reasonable fire protection with the realistic concerns of cost and redundancy. NFPA 13D has always recognized that if fire sprinkler systems are too much like NFPA 13, they will not be installed in one-and two-family dwellings and they will not be able to help change the fact that thousands of people continue to die each year due to fires in unsprinklered one-and two-family dwellings. As such, the Technical Committee on Residential Sprinkler Systems, concerned with the overall effort to get sprinkler systems into more one- and two-family dwellings is consciously choosing to be less restrictive than NFPA 13, while still maintaining a reasonable level of fire safety for the occupants of sprinklered one- and two-family dwellings.

The information provided in the report, Antifreeze Systems in Home Fire Sprinkler Systems – Phase II Report (Fire Protection Research Foundation, December 2010) was the basis for TIA 10-2 to NFPA 13D that was issued by the NFPA on March 1, 2011. That research report is still valid and demonstrates how residential sprinklers perform in typical dwelling units of typical one- and two-family dwellings with a variety of antifreeze solutions tested through a variety of pendent and sidewall residential sprinklers.

Subsequent testing has been performed as a part of a project sponsored by the Fire Protection Research Foundation (FPRF), who released an interim report in February of 2012 titled, Antifreeze Solutions Supplied through Spray Sprinklers. This report followed up on the Phase II tests and looked at antifreeze solutions and their performance with a variety of standard spray sprinklers. Given that NFPA 13D calls for the use of residential sprinklers in all locations except mechanical closets and unheated areas not intended for living purposes (see section 7.5.3 and 7.5.4 of NFPA 13D), the results of this latest FPRF research is less important to NFPA 13D. Still, in reviewing the results of the tests, the committee has chosen to tighten up the rules with respect to new installations by proposing this TIA so that designers can make better decisions regarding the potential use of antifreeze systems.

Based on input from Authorities Having Jurisdiction, a total ban on antifreeze systems is not realistic and would be detrimental to the effort to pass legislation for mandatory sprinkler requirements in one- and two-family dwellings. Since there are currently no listed antifreeze solutions, a requirement to only use listed antifreeze would be tantamount to a ban on the use of antifreeze. While the use of listed antifreeze systems is probably the best long-term solution, some recognition of glycerine or propylene glycol is necessary in the short term, even for new systems. NFPA 13D systems are intended to be cost effective. Completely eliminating the use of antifreeze in specific, isolated areas, may significantly drive up the cost of residential sprinkler systems.

Based on input from Authorities Having Jurisdiction, a total ban on antifreeze systems is not realistic and would be detrimental to the effort to pass legislation for mandatory sprinkler requirements in one- and two-family dwellings. Since there are currently no listed antifreeze solutions, a requirement to only use listed antifreeze would be tantamount to a ban on the use of antifreeze. While the use of listed antifreeze systems is probably the best long-term solution, some recognition of glycerine or propylene glycol is necessary in the short term, even for new systems. NFPA 13D systems are intended to be cost effective. Completely eliminating the use of antifreeze in specific, isolated areas, may significantly drive up the cost of residential sprinkler systems.

This TIA starts out expressing a preference for the use of listed antifreeze systems in section 9.2.2.1, but then goes on to allow the use of unlisted 48% glycerine or 38% propylene glycol where two conditions are met. The first condition is that the system has to be acceptable to the Authority Having Jurisdiction (AHJ). It is anticipated that the AHJ will understand the gravity of the decision and only
approve situations where other options have been explored and rejected as impossible or impractical. The second condition is that the antifreeze has to be limited to a “specific area”. The committees intent is to limit the antifreeze as much as possible to the portion of the system that will experience the cold temperatures. This language is the best that the committee could agree on that allowed the flexibility necessary to handle the wide range of design situations that currently exist. It is anticipated that the AHJ would be able to consider each situation on a case-by-case basis and determine if the system was sufficiently isolated.

The use of 48% glycerine and 38% propylene glycol is supported by the Phase II test report discussed above when limited to residential sprinklers in typical dwelling units. This position is strengthened by the existing requirement in section 9.2.2.2 (which becomes 9.2.2.3 in this TIA), which requires the antifreeze to be limited to what is needed for the environment. If the pipe is only going to be subjected to temperatures of 20°F, then a solution of 48% glycerine would not be permitted and a premixed solution of 25% glycerine should be used instead since this is all that is needed to protect down to 20°F.

In order to provide the designer with as much information as possible, so that informed decisions can be made, this TIA proposes an expanded annex section that discusses the findings of the various tests that have been performed, including the latest tests just released. This should help designers understand the risks involved and the consequences of their decisions and help guide them to keep antifreeze solutions to the lowest possible concentrations if they decide they want to use antifreeze at all.

This TIA does not propose changes to the rules for existing systems (allowing them to stay as they were in TIA 10-2 with up to 50% glycerine and 40% propylene glycol). This decision was made after a review of the testing programs to date and a first order risk analysis that looked at the potential problems that would arise if we forced people to retroactively change out their existing systems. This risk analysis shows that the risk of changing the antifreeze requirements for existing building and forcing building owners to make a change is higher (6 to 6.3 deaths per year) than leaving the 50% glycerine or 40% propylene glycol in systems (3.0 to 3.6 deaths/year). The following is a summary of this analysis:

Risk Analysis for Antifreeze Systems

Assumptions

- There are approximately 100 million homes (1 and 2 family) in America
- There are approximately 300,000 fires in the homes each year (0.003 fires/home/year)
- There are approximately 3000 fire deaths per year in homes (0.01 deaths/fire)
  - Of these fire deaths, 10% occur in fires that started in spaces that NFPA 13D does not require to be sprinklered, so these deaths will be assumed in this analysis to occur, even in sprinklered homes, even though actual fire experience has shown that sprinklers in adjacent rooms sometimes activate to control these fires and significant losses are not being experienced.
  - In an effort to be conservative, this analysis will also assume that sprinklers are only 90% effective, even though significant work has shown them to be much more effective
  - There are approximately 2 million sprinklered homes in America (2% of all homes)
  - There are approximately 500,000 systems (25% of all sprinklered homes) with antifreeze that is required right now by NFPA 13D to be a maximum of 50% glycerin or 40% propylene glycol
  - There are approximately 1500 fires/yr in the homes with these antifreeze systems
  - There have been no deaths associated with fires in homes having antifreeze systems with 50% or less glycerine or 40% or less propylene glycol
  - There have been two incidents of flash fires in the last 5 years causing 1 death and 2 serious injuries in apartments. In both cases, the system concentration is believed to have been greater than 50% with one of these being believed to be 70% glycerene and the other 60% glycerene. For the purposes of this conservative analysis, the 2 serious injuries will be considered as deaths.
  - Using these last two bullet points, the risk of death due to flash fire caused by the antifreeze is between 0 and 0.0004 deaths per year depending on what mix of concentrations is assumed for the population of sprinklered homes with antifreeze in the systems.

If the Situation is Left “As Is” with 50% Glycerine or 40% Propylene Glycol Allowed to Remain
There will be 1500 fires each year in the systems with antifreeze (500,000 sprinklered homes with antifreeze and 0.003 fires/home/year)

- There will be 3 deaths per year assuming that sprinklers are 90% effective and in 90% of the locations where deadly fires start (1500 fires times 0.01 deaths per fire is a potential for 15 deaths, 1.5 might occur from fires starting in unsprinklered spaces, 1.5 might occur due to some failure of the system, the other 12 will be saved)

- There will be between 0 and 0.6 deaths due to flash fires depending on the population of antifreeze solutions in homes (1500 fires times 0.0004 is 0.6, which is extremely conservative considering this statistic is gathered from high concentrations systems that were not in homes)

- Total of between 3.0 and 3.6 possible deaths per year from this decision

If We Call for Replacement/Reduction of Solutions

- Assumption that 125,000 systems (25% of existing antifreeze systems) will get turned off

- Assumption that 125,000 people (25% of existing antifreeze systems) will comply and spend the money to do something else (lower system concentration, heat tracing or conversion to dry-pipe or preaction system)

- Assumption that 250,000 systems (50% of existing systems) will be left “as is” with whatever antifreeze they have

- The homeowners who shut off their systems will experience 375 fires and 3.75 fire deaths that can’t be prevented by a sprinkler system shut off

- The homeowners that complied will experience 375 fires and 0.75 fire deaths assuming the sprinkler systems are 90% effective and that sprinklers are installed in 90% of locations where deadly fires start

- The homeowners that left their systems “as is” will experience 750 fires and between 1.5 and 1.8 fire deaths (1.5 of the fire deaths are from the system being 90% effective and 90% of the fires starting in sprinklered spaces and up to 0.3 of the fire deaths are from the potential for a flash fire depending on the antifreeze concentrations that are assumed)

- Total of between 6.0 and 6.3 potential deaths per year from this decision

Of course, any risk analysis like this is dependent on the assumptions used to formulate the conclusions. A sensitivity analysis was performed on the assumption above that if some change was required by NFPA 13D that 25% of the systems would be shut off and only 25% of the systems would be changed to comply. If the assumption was changed to 10% of the systems being shut off and 80% of the systems being changed to comply (with the remaining 10% of the systems left “as is”) then the decision to force the change still comes out worse (with a risk between 4.2 and 4.26) than the decision to leave all of the systems alone (with a risk between 3 and 3.6).

Emergency Nature: This TIA has been prompted by the recently released interim research report, Antifreeze Solutions Supplied through Spray Sprinklers, issued by the Fire Protection Research Foundation in February of 2012. It is part of a package of TIA’s being submitted by each of the fire sprinkler installation and maintenance documents in order to address the issues raised by that research. It meets the definition of part 5.2(c) in the Regulations Governing Committee Projects as an emergency since the issues raised by the research where not known at the time the standard was being developed.

The use of propylene glycol and glycerin antifreeze solutions should only be considered when other sprinkler system design alternatives are not available or practical. If these solutions are used, all relevant data and information should be carefully reviewed and considered in design and installation of the sprinkler system.

Submitter Information Verification

Submitter Full Name: Terry Victor
Organization: Tyco/SimplexGrinnell
Submittal Date: Fri Jan 25 11:08:01 EST 2013
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Public Input No. 16-NFPA 13D-2012 [Section No. A.10.2]

A.10.2

All residential sprinklers have been investigated under a flat, smooth, 8 ft (2.4 m) high horizontal ceiling. Some residential sprinklers have been investigated and listed for use under specific ceiling configurations such as a horizontal beamed ceiling. The performance of residential sprinklers under flat, smooth, horizontal ceilings has been well documented throughout the life of NFPA 13D. Prior to 2010, several manufacturers of residential sprinklers had performed testing and received listings for residential sprinklers under certain slopes and in certain beam conditions. In 2010, the Fire Protection Research Foundation (FPRF) conducted a research project consisting of 76 FDS simulations and 12 full-scale fire tests. The results have been used to develop system design criteria in a generic manner in order to simplify the use of residential sprinklers. Some residential sprinkler listings still exist for situations beyond the scope of the generic design. See the FPRF report, “Analysis of the Performance of Residential Sprinkler Systems with Sloped or Sloped and Beamed Ceilings” dated July 2010 for more information.

Questions are frequently asked regarding the minimum two sprinkler design when certain sprinkler performance statistics have indicated that in a majority of the cases (with residential sprinklers) the fire is controlled or suppressed with a single sprinkler. While these statistics might or might not be accurate, the water supplies for the fire sprinkler systems under which these statistics were generated were designed for two or more sprinklers in the first place. When the fires occurred, the first sprinkler operated in excess of its individual design flow and pressure because the sprinkler system’s water supply was strong enough to handle multiple sprinklers and only a single sprinkler opened. At these higher flows and pressures, the discharge from a single sprinkler was sufficient to limit or suppress the heat generated from the fire. This concept is called “hydraulic increase.” Hydraulic increase can also occur when a water supply’s capabilities during the fire event exceeded that required by the minimum design requirements of the standard. Since none of the data used to generate the previously mentioned statistics captured the capabilities of the water supply in relation to the design requirements, the impact of the hydraulic increase on the number of single sprinkler activations cannot be determined.

But if the minimum water supply requirement of the standard is reduced to only be capable of handling a single sprinkler, then there could be no hydraulic increase safety factor. When the first sprinkler opens, it will only get the flow and pressure that were originally designed for it, and the potential is significant for that to be insufficient to control the fire, given any obstructions and the layout of the space where the fire starts.

The National Institute for Standards and Technology (NIST), under a grant from the United
States Fire Administration, studied this concept several years ago in the hopes of being able to propose a single-sprinkler flow for the 2007 edition of NFPA 13D (see NIST Report NIST GCR 05-875 prepared by Underwriters Laboratories with a publication date of February 2004). Unfortunately, the research did not support the design of a sprinkler system with only the flow for a single sprinkler, even under conditions of small rooms with flat, smooth ceilings. Without the hydraulic increase associated with the two-sprinkler design, the fire scenarios were too many where the first sprinkler to open would have insufficient flow to control the fire and then multiple sprinklers would open, causing the room to reach untenable conditions and the water supply to be overrun. These same fire scenarios were easily controlled by a sprinkler system designed for a two-sprinkler water supply from the start.

In addition to the NIST tests, the National Fire Sprinkler Association conducted a series of full-scale fire tests in simulated bedrooms that were 14 ft × 14 ft (4.3 m × 4.3 m) with an adjoining hallway, each with flat, smooth, 8 ft (2.4 m) high ceilings. The tests were performed to determine better rules for keeping sprinklers clear of obstructions like ceiling fans, but baseline tests were also performed without any obstructions at the ceiling. In nine out of the twelve tests, including the two baseline tests without obstructions at the ceiling, a sprinkler in the hall outside the room of fire origin opened first, followed by the sprinkler in the room of origin. Even though the room of origin met all of the rules of NFPA 13D as a compartment, a sprinkler outside of this room was opening first. All of these fires were controlled by the sprinklers, but if the water supply had only been sufficient for a single sprinkler, the sprinklers would never have been able to provide fire control.

For examples of selecting a compartment for consideration, see Figure A.10.2(a) and Figure A.10.2(b), which show examples of design configurations for compartments based on the presence of lintels to stop the flow of heat.

Figure A.10.2(a) Sprinkler Design Areas for Typical Residential Occupancy — Without Lintel.

Figure A.10.2(b) Sprinkler Design Areas for Typical Residential Occupancy — With Lintel.

Statement of Problem and Substantiation for Public Input

While in this particular test it may be true that a sprinkler outside the compartment opened first, this contradicts the body of the standard as written. If we have a dwelling that is comprised of compartments that have only one sprinkler in each of them, we would only calculate a single sprinkler. We have encountered several AHJ’s that will not allow a single compartment sprinkler calculation because of the language in this annex note. A common practice in the industry is to calculate two sprinklers at a smaller spacing (16’x16’) in the larger compartments and calculate a single sprinkler at
the maximum spacing (20’x20’) in compartments with only one sprinkler. If this is a concern, then maybe a FPRF project needs to be initiated and we need to look at eliminating the compartment approach to NFPA 13D.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 10:35:12 EST 2012

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Public Input No. 41-NFPA 13D-2013 [ Section No. A.10.2 ]

A.10.2

All residential sprinklers have been investigated under a flat, smooth, 8 ft (2.4 m) high horizontal ceiling. Some residential sprinklers have been investigated and listed for use under specific ceiling configurations such as a horizontal beamed ceiling. The performance of residential sprinklers under flat, smooth, horizontal ceilings has been well documented throughout the life of NFPA 13D. Prior to 2010, several manufacturers of residential sprinklers had performed testing and received listings for residential sprinklers under certain slopes and in certain beam conditions. In 2010, the Fire Protection Research Foundation (FPRF) conducted a research project consisting of 76 FDS simulations and 12 full-scale fire tests. The results have been used to develop system design criteria in a generic manner in order to simplify the use of residential sprinklers. Some residential sprinkler listings still exist for situations beyond the scope of the generic design. See the FPRF report, “Analysis of the Performance of Residential Sprinkler Systems with Sloped or Sloped and Beamed Ceilings” dated July 2010 for more information.

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“hydraulic increase.” Hydraulic increase can also occur when a water supply’s capabilities during the fire event exceeded that required by the minimum design requirements of the standard. Since none of the data used to generate the previously mentioned statistics captured the capabilities of the water supply in relation to the design requirements, the impact of the hydraulic increase on the number of single sprinkler activations cannot be determined.

But if the minimum water supply requirement of the standard is reduced to only be capable of handling a single sprinkler, then there could be no hydraulic increase safety factor. When the first sprinkler opens, it will only get the flow and pressure that were originally designed for it, and the potential is significant for that to be insufficient to control the fire, given any obstructions and the layout of the space where the fire starts.

The National Institute for Standards and Technology (NIST), under a grant from the United States Fire Administration, studied this concept several years ago in the hopes of being able to propose a single-sprinkler flow for the 2007 edition of NFPA 13D (see NIST Report NIST GCR 05-875 prepared by Underwriters Laboratories with a publication date of February 2004). Unfortunately, the research did not support the design of a sprinkler system with only the flow for a single sprinkler, even under conditions of small rooms with flat, smooth ceilings. Without the hydraulic increase associated with the two-sprinkler design, the fire scenarios were too many where the first sprinkler to open would have insufficient flow to control the fire and then multiple sprinklers would open, causing the room to reach untenable conditions and the water supply to be overrun. These same fire scenarios were easily controlled by a sprinkler system designed for a two-sprinkler water supply from the start.

In addition to the NIST tests, the National Fire Sprinkler Association conducted a series of full-scale fire tests in simulated bedrooms that were 14 ft × 14 ft (4.3 m × 4.3 m) with an adjoining hallway, each with flat, smooth, 8 ft (2.4 m) high ceilings. The tests were performed to determine better rules for keeping sprinklers clear of obstructions like ceiling fans, but baseline tests were also performed without any obstructions at the ceiling. In nine out of the twelve tests, including the two baseline tests without obstructions at the ceiling, a sprinkler in the hall outside the room of fire origin opened first, followed by the sprinkler in the room of origin. Even though the room of origin met all of the rules of NFPA 13D as a compartment, a sprinkler outside of this room was opening first. All of these fires were controlled by the sprinklers, but if the water supply had only been sufficient for a single sprinkler, the sprinklers would never have been able to provide fire control.

For examples of selecting a compartment for consideration, see Figure A.10.2(a) and Figure A.10.2(b), which show examples of design configurations for compartments based on the presence of lintels to stop the flow of heat.

Figure A.10.2(a) Sprinkler Design Areas for Typical Residential Occupancy — Without Lintel.

![Figure A.10.2(a) Sprinkler Design Areas for Typical Residential Occupancy — Without Lintel.](image)

Figure A.10.2(b) Sprinkler Design Areas for Typical Residential Occupancy — With Lintel.
Statement of Problem and Substantiation for Public Input

We just are requesting that the words "would never" be changed to "might not" in the last line. This has to do with a judgement regarding the results of fire tests we conducted and the way our phase is being interpreted. Rather than making the definitive statement that something "never" would happen, we are more comfortable saying that it "might" not happen.

Submitter Information Verification

Submitter Full Name: Roland Asp
Organization: National Fire Sprinkler Association
Affiliation: NFSA E&S Committee
Submittal Date: Fri May 24 14:23:36 EDT 2013

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Sensitivity Testing of a Residential Horizontal Sidewall Sprinkler with Shadow Areas

Testing was conducted at The Viking Corporation test facility to determine the effects on sensitivity of a shadow area on the currently listed Viking Model VK486 residential horizontal sidewall sprinkler. Testing was conducted in a 16 x 20 ft. coverage area and with a shadow area consisting of 4” “bumped out wall section”. The testing was conducted using an 8 ft. ceiling, with the sprinkler installed both 4” and 12” from the ceiling, with doorways and openings closed, and using a natural gas sand burner (described in UL1626) flowing at 500 scfm. Tests were conducted in the same coverage area without bumped out wall sections for comparison purposes and a total of 6 samples were tested in each configuration.

The test room layout using the 4’ x 14’ bumped out wall creating a shadow area is shown in Fig. 1.

![Fig. 1](image)

The data for the room response test is shown below.
### Viking VK486 155°F

Gas flow rate - 500 scfm

Numbers shown are sprinkler response time in seconds

#### 20'x16' Room with 14'x4' bumpout

<table>
<thead>
<tr>
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<th>4&quot; Down</th>
<th>12&quot; Down</th>
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<td>49.8</td>
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<td><strong>Average</strong></td>
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</table>

#### 20'x16' Room without bumpout

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<td>1</td>
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<td>65.3</td>
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<td><strong>Average</strong></td>
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x Sprinkler location
Distribution Testing of Various Residential and Commercial Horizontal Sidewall Sprinklers with Shadow Areas

Testing was conducted at The Viking Corporation test facility to determine the effects on water distribution of various shadow areas on listed/approved residential and commercial horizontal sidewall sprinklers. Distribution tests were conducted on various sprinklers listed/approved for use in 16 x 20 ft. coverage areas and with shadow areas consisting of 2' and 4' "bumped out wall sections". Testing was conducted with an 8 ft ceiling and with doorways and openings closed. The Viking Models VK486 (4.0k residential sidewall sprinkler), VK460 (5.8k residential sidewall sprinkler), VK605 (5.6k EC/QREC sidewall sprinkler), and VK630 (8.0k QREC sidewall sprinkler), were used for this testing. The listed/approved flow rate(s) were used for each sprinkler.

The distribution test layout using the 4’ x 14’ bumped out wall creating a shadow area is shown in Fig. 1.

Other shadow area configurations that were tested include bumped out wall dimensions of, 4’ x 12’, 4’ x 10’, 4’ x 8’, 4’ x 6’, 4’ x 4’, 2’ x 12’, 2’ x 10’, 2’ x 8’, 2’ x 6’, and 2’ x 4’.
Distribution tests were conducted using 1’ x 1’ x 1’ collection pans. Tests were run for 20 minutes. All shadow area distribution tests utilized collection pans located in the actual shadow area only. For example, in Fig. 1, the 4’ x 6’ area at the end of the bumped out wall is where the collection pans were located. For comparison purposes distribution tests without any bumped out wall section were conducted with the water collected in one half of the coverage area of the sprinkler.

The results of the floor collections for all configurations are shown on the following pages.
Open room VK486

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<thead>
<tr>
<th></th>
<th>4'</th>
<th>6'</th>
<th>7'</th>
<th>8'</th>
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Sprinkler location
## Open room VK460

**VK460**  
26 GPM  
Sprinkler location

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Open room VK605

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Open room VK630

VK630  32 GPM  Sprinkler location

X  4'  6'  7'  8'

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3  4  3  10
5  5  3  11
13  8  3  11
28  11  3  12
28  11  3  14
28  10  4  17
21  8  5  21
5  5  5  25
3  3  5  28
3  3  5  28
4  4  6  24
4  4  5  19
5  5  6  15
5  5  5  11
6  6  5  8
7  6  5  6
X  X  X  X
4' wall 6' gap VK486

VK486  22 GPM

Sprinkler location

X

4' 6' 7' 8'

2'

4'

6'

8'

10'

12'

14'

16'

18'

20'

3 T T T T

2 T T T

16'

3 T T T

3 T T T

18'

4 1.5 T T

x x x x

x
4' wall 8' gap VK486

VK486 22 GPM Sprinkler location

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Sprinkler location

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Sprinkler location
4'wall 8'gap VK605

VK605  32 GPM (12" down)  Sprinkler location

X

4'  6'  7'  8'

2'

4'

6'

8'

10'

12'

14'

16'

18'

20'

5  T  T  T

2  T  T  T

2  T  T  T

2  T  T  T

2  T  T  T

2  T  T  T

3  2  T  T

3  2  T  T

X  X  X  X
2' wall 8' gap VK605

VK605 32 GPM (12" down)

Sprinkler location

X

4' 6' 7' 8'

2'

4'

6'

8'

10'

12'

14'

16'

18'

20'

3 T

4 T

4 1

4 2

3 3

2 3

X X
### Sprinkler Location

**Sprinkler Location:**

<table>
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**Sprinkler Details:**

- **2' Wall 8' Gap VK630**
- **VK630**
- **32 GPM**

**Sprinkler Locations:**

- 2 T
- 3 T
- 4 1
- 5 3
- 5 5
- 6 5
- 6 6
- X X

**Dimensions:**

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<th>12'</th>
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<th>16'</th>
<th>18'</th>
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**Legend:**

- X: Sprinkler Location
- T: Wall Location
- 2: Wall Height
- 4: Wall Height
- 6: Wall Height
- 8: Wall Height
4'wall 10'gap VK486

VK486  22 GPM

Sprinkler location

X

4'  6'  7'  8'

2'

4'

6'

8'

10'

12'

14'

16'

18'

20'

4  T  T  T

1  T  T  T

2  T  T  T

3  T  T  T

3  1.5  T  T

4  2  T  T

4  3  1.5  T

4  3  2  T

5  4  4  3

X  X  X  X
4' wall 10' gap VK460

VK460  26 GPM

Sprinkler location
4' wall 10' gap VK605

VK605 32 GPM (12" down) Sprinkler location

X 4' 6' 7' 8'

2'

4'

6'

8'

10'

12'

14'

16'

18'

20'

8 T T T

3 T T T

2 T T T

3 T T T

3 1.5 T T

3 2 T T

3 2 1.5 T

3 2 2 T

3 3 3 1

X X X X
4' wall 10' gap VK630

VK630 32 GPM

Sprinkler location

X

4' 6' 7' 8'

7 T T T

2 T T T

4 T T T

5 T T T

5 3 T T

5 5 1 T

6 5 3 T

6 6 5 T

7 7 7 3

X X X X
2' wall 10' gap VK486

VK486 22 GPM

Sprinkler location

X

4' 6' 7' 8'

2'

4'

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8'

10'

12'

14'

16'

18'

20'

1.5 T

3 T

5 2

6 4

6 5

6 5

4 6

4 6

4 6

X X
### Sprinkler Location

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*Notes:*
- Wall 10' gap
- VK605 location
- 32 GPM flow rate (12" diameter)

### Grid Layout

#### Sprinkler Locations

- **X** indicates sprinkler location

#### Dimensions

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#### Measurements

- Vertical: 20', 18', 16', 14', 12'
- Horizontal: 4', 6', 8', 10'

#### Key Points

- Sprinkler ID: VK605
- Flow Rate: 32 GPM (12" diameter)
- Wall Gap: 10'

---

*For detailed placement and coverage, refer to the above diagram.*
2' wall 10' gap VK630

VK630 32 GPM

Sprinkler location

X 4' 6' 7' 8'

1.5 T

3 T

4 2

4 3

4 5

5 6

5 6

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6 6

X X
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4' wall 12' gap VK605

VK605 32 GPM (12" down) Sprinkler location

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14'

16'

18'

20'

4' T T T

6' T T T

7' T T T

8' T T T

5' 1.5 T T

7 T T T

4 T T T

5 T T T

10' T T T

12' 2 T T

14' 3 T T

16' 2 T T

18' 2 T T

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</table>
2' wall 12' gap VK460

VK460  26 GPM  Sprinkler location

x

Sprinkler location

X X
2' wall 12' gap VK605

VK605 32 GPM (12" down) Sprinkler location

Sprinkler location

X

2' 4'

4'

6'

5

10 T

14 7

16 8

10 8

4 6

3 5

2 4

2 3 2 3

X X

20'
4' wall 14' gap VK486

VK486 22 GPM

Sprinkler location

X 4' 6' 7' 8' 2' 4' 6' 8'

6 T T T

8 1.5 T T

8 2 T T

7 3 1 T

6 T 2 T

5 3 2 1.5

4 3 3 4

4 3 3 5

3 3 4 5

3 3 3 5

3 3 4 5

3 4 4 6

X X X X

Sprinkler location
# Sprinkler Location Diagram

**4' Wall 14' Gap VK460**

**VK460 26 GPM**

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<td>8 11 11 12</td>
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</tbody>
</table>
Sprinkler location

X

4' 6' 7' 8'

2'

4'

6'

8'

10'

12'

14'

16'

18'

20'

5 T T T

5 T T T

8 3 T T

8 6 2 T

7 6 5 1.5

6 5 5 3

5 4 4 3

3 3 3 3

2 3 3 3

2 2 3 3

2 3 3 3

2 3 3 3

2 2 3 3

X X X X
4' wall 14' gap VK630

VK630 32 GPM

Sprinkler location

X

4' 6' 7' 8'

2'

4'

6'

19 T T T

28 2 T T

28 5 T T

25 5 T 1 T

19 4 2 T

8 4 4 4

4 4 4 4

4 4 5 6

5 5 5 7

5 5 5 6

10'

6 6 6 6

6 6 6 6

8 8 7 7

20'

X X X X
2' wall 14' gap VK460

VK460 26 GPM Sprinkler location

X

2' 4'

6' 7'

8'
<table>
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<tr>
<th>Sprinkler location</th>
<th>X</th>
<th>4'</th>
<th>6'</th>
<th>7'</th>
<th>8'</th>
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</thead>
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<tr>
<td>VK605</td>
<td></td>
<td>32 GPM (12&quot; down)</td>
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</table>

- **2' wall 14' gap VK605**: Sprinkler location

- **X X**: Sprinkler location

- **Sprinkler location**: 9
  
- **Sprinkler location**: 18
  
- **Sprinkler location**: 19
  
- **Sprinkler location**: 12
  
- **Sprinkler location**: 6
  
- **Sprinkler location**: 4
  
- **Sprinkler location**: 3
  
- **Sprinkler location**: 2
  
- **Sprinkler location**: X

**Note**: The diagram shows the sprinkler locations with specific measurements for spacing and positioning.
2' wall 14' gap VK630

VK630 32 GPM

Sprinkler location
4' wall 16' gap VK486

Sprinkler location

X

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VK486 22 GPM
4' wall 16' gap VK460

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<th>7'</th>
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Sprinkler location
4'wall 16'gap VK605

VK605  32 GPM (12" down)  Sprinkler location

Sprinkler location

x
2' wall 16' gap VK486

VK486 22 GPM

Sprinkler location
2' wall 16' gap VK460

VK460 26 GPM

Sprinkler location

X

4' 6' 7' 8'

2'

4'

2 5

4 4

4 2

3 T

X X

20'
2' wall 16' gap VK605

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<th>Sprinkler location</th>
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### Sprinkler Location

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2' wall 16' gap VK630

VK630 32 GPM

Sprinkler location

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NFPA 13 Column Testing

Testing was conducted at the Viking Corporation burn building to determine the effects of various size columns on sprinkler performance. Floor collection, wall wetting and a sprinkler response test were conducted with a 9” column, a 24” column and no column, in a 20’ x 40’ room, with an 8” ceiling. For this testing, the following sprinklers were used; VK468 (4.9k residential pendent), VK472 (5.8k residential pendant), VK600 (5.6k ECLH pendent), VK602 (8.0k ECLH pendent), and VK608 (11.2k ECLH pendent). All the sprinklers are currently UL Listed.

The floor collection layout is shown in fig. 1, 1’ x 1’ x 1’ collection buckets were used.

The wall wetting and the room response tests were conducted in the same room. For the wall wetting tests, Kraft paper was attached to the walls. For the residential sprinklers, the UL criteria is the paper must be wet 28” down from the ceiling. For the commercial ECLH sprinklers, the UL criteria is the paper must be wet 30” when measured from the floor up. For the column testing, a 9” x 9” column was positioned 36” away from the sprinkler (when measured diagonally from the sprinkler to the corner of the room) and a 24” column was also positioned 36” away from the sprinkler. The position of the column is shown in the layout for the room response test. For the floor collections with the columns, the necessary pans were removed. This is shown on the floor collection data sheets. The room response testing was conducted using a natural gas sand burner, outlined in UL 199 Figure 31.3, flowing 400 scfm. An example of the room layout is shown in Fig. 2. The results of the room response tests are shown in Table 1.
Room Response Test

Testing was conducted using a recessed pendent sprinkler with a 155°F 3mm glass bulb

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<td>9&quot; column</td>
<td>4:49</td>
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<tr>
<td>24&quot; column</td>
<td>test was stopped at 10 minutes and sprinkler had not operated</td>
</tr>
</tbody>
</table>

Table 1
Summary

The 9” and 24” column had a significant impact on the floor collection and wall wetting results on all the sprinklers tested with the 24” column having a bigger impact on the results. Every test with the columns produced a large amount of buckets without any water as well as areas of paper in the wall wetting test that were completely dry.

For the wall wetting tests conducted on the ECLH sprinklers, paper was hung on the wall with the top of the paper at 30”. Water hit higher on the wall in many areas, but was only measured 30” up from the floor to confirm compliance with applicable UL listing requirements. The wall wetting tests on the ECLH sprinklers with the 9” column are somewhat misleading. During the test, the paper was getting wet and gradually filled in over the course of the 10 minutes with the column present. However it should be noted that the wetting was the result of indirect mist/overspray and not direct impingement. Without the column, large drops were produced and wet the paper immediately.

The most noticeable impact was during the room response test. With the 24” column, the sprinkler failed to operate.
U.L.1626.24 RESIDENTIAL FLOOR COLLECTION DATA

Coverage Area 20' X 20'

Model: VK468  K = 4.9  Type: Recessed Pendent Residential

Flow: 20 GPM  Test Duration: 20 Min.  Date: 11/16/2012

Frame Arms: Parallel  Perpendicular

N

Sprinkler

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</table>

Floor Dist.

Average: 3.490  Low: 2.000  High:

Notes: No column

Tested By: ____________________________

Form RD-1033B
U.L.1626.24 RESIDENTIAL WALL WETTING DATA
Coverage Area 20' X 20'

Model: VK468  K = 4.9  Type: Recessed Pendent Residential  No column
Flow: 20 GPM  Test Duration: 10 Min.  Date: 11/16/2012

[Diagram showing coverage area with dimensions and flow rate]
### U.L.1626.24 RESIDENTIAL FLOOR COLLECTION DATA

**Coverage Area**: 20' X 20'

**Model**: VK468  
**K**: 4.9  
**Type**: Recessed Pendent Residential

**Flow**: 20 GPM  
**Test Duration**: 20 Min.  
**Date**: 11/14/2012

**Frame Arms**: Parallel  
**Perpendicular**

---

#### Sprinkler Grid

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#### Floor Dist.

- **Average**: 3.390
- **Low**: 0.000
- **High**:

---

#### Notes:

- 9" column

---

**Tested By**: ____________________________

---

**Form**: RD-1033B
U.L.1626.24 RESIDENTIAL WALL WETTING DATA
Coverage Area 20' X 20'

Model: VK468  K = 4.9  Type: Recessed Pendent Residential  9" column
Flow: 20 GPM  Test Duration: 10 Min.  Date: 11/14/2012
**U.L.1626.24 RESIDENTIAL FLOOR COLLECTION DATA**

Coverage Area  20’ X 20’

Model: VK468  
K = 4.9  
Type: Recessed Pendent Residential

Flow: 20 GPM  
Test Duration: 20 Min.  
Date: 11/13/2012

Frame Arms:  
- Parallel  
- Perpendicular

**Sprinkler**

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**Floor Dist.**  
Average: 2.990  
Low: 0.000  
High: 

**Notes:**  
- 24" column

**Tested By:**
Model: VK468  
K = 4.9  
Type: Recessed Pendent Residential  
24” column

Flow: 20 GPM  
Test Duration: 10 Min.  
Date: 11/13/2012

U.L.1626.24 RESIDENTIAL WALL WETTING DATA
Coverage Area 20’ X 20’
U.L.1626.24 RESIDENTIAL FLOOR COLLECTION DATA
Coverage Area 20' X 20'

Model: VK472  K = 5.8  Type: Recessed Pendent Residential

Flow: 21 GPM  Test Duration: 20 Min.  Date: 11/16/2012

Frame Arms: Parallel  x  Perpendicular

Sprinkler X

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Floor Dist. Notes: No column

Average: 3.450  Low: 2.000  High: ______

Tested By: ________________________________

Form RD-1033B
U.L.1626.24 RESIDENTIAL WALL WETTING DATA
Coverage Area 20' X 20'
Model: VK472   K = 5.8   Type: Recessed Pendent Residential   No column
Flow: 21 GPM   Test Duration: 10 Min.   Date: 11/16/2012
### U.L.1626.24 RESIDENTIAL FLOOR COLLECTION DATA

**Coverage Area:** 20' X 20'

**Model:** VK472  
**K:** 5.8  
**Type:** Recessed Pendent Residential

**Flow:** 21 GPM  
**Test Duration:** 20 Min.  
**Date:** 11/14/2012

**Frame Arms:** x Parallel Perpendicular

---

**Floor Dist. Notes:**

9" column: 3.190
Low: 0.000  
High: ----

**Tested By:**

---

**Notes:**

9" column:  

---

**Form:** RD-1033B
U.L.1626.24 RESIDENTIAL WALL WETTING DATA

Coverage Area  20' X 20'

Model: VK472  K = 5.8  Type: Recessed Pendent Residential  9" column

Flow: 21 GPM  Test Duration: 10 Min.  Date: 11/14/2012
U.L.1626.24 RESIDENTIAL FLOOR COLLECTION DATA

Coverage Area  20' X 20'

Model: VK472  K =  5.8  Type: Recessed Pendent Residential

Flow: 21 GPM  Test Duration: 20 Min.  Date: 11/13/2012

Frame Arms:  Parallel  X  Perpendicular

Floor Dist. Notes:  24" column

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Notes: 24" column

Floor Dist.
Average: 2.940
Low: 0.000
High:

Tested By: ____________________________

Form  RD-1033B
U.L.1626.24 RESIDENTIAL WALL WETTING DATA
Coverage Area  20' X 20'

Model: VK472  K = 5.8  Type: Recessed Pendent Residential
Flow: 21 GPM  Test Duration: 10 Min.  Date: 11/13/2012

24" column
**U.L.1626.24 RESIDENTIAL FLOOR COLLECTION DATA**

Coverage Area  20' X 20'

- **Model:** VK600
- **K:** 5.6
- **Type:** Recessed Pendent ECLH

- **Flow:** 40 GPM
- **Test Duration:** 20 Min.
- **Date:** 11/16/2012

**Frame Arms:**
- Parallel
- Perpendicular

**Sprinkler Distribution:**

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**Floor Dist.**

- **Average:** 5.920
- **Low:** 1.000
- **High:**

**Notes:** No column

**Tested By:**

---

Form RD-1033B
**U.L.1626.24 RESIDENTIAL WALL WETTING DATA**

Coverage Area: 20' X 20'

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Flow: 40 GPM  
Test Duration: 10 Min.  
Date: 11/16/2012
U.L.1626.24 RESIDENTIAL FLOOR COLLECTION DATA
Coverage Area  20’ X 20’

Model: VK600  
K = 5.6  
Type: Recessed Pendent ECLH

Flow: 40 GPM  
Test Duration: 20 Min.  
Date: 11/14/2012

Frame Arms: Parallel  
Perpendicular

Sprinkler

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**Floor Dist.**
Average: 5.320
Low: 0.000
High: ______

**Notes:** 9" column

**Tested By:**

Form RD-1033B
Model: VK600  
K = 5.6  
Type: Recessed Pendent ECLH  
9" column

Flow: 40 GPM  
Test Duration: 10 Min.  
Date: 11/14/2012

U.L.1626.24 RESIDENTIAL WALL WETTING DATA
Coverage Area 20' X 20'
### U.L.1626.24 RESIDENTIAL FLOOR COLLECTION DATA

**Coverage Area**: 20' X 20'

- **Model**: VK600
- **K**: 5.6
- **Type**: Recessed Pendent ECLH
- **Flow**: 40 GPM
- **Test Duration**: 20 Min.
- **Date**: 11/13/2012
- **Frame Arms**: Parallel

#### Sprinkler分布

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#### Floor Dist.

- **Average**: 4.560
- **Low**: 0.000
- **High**: ______

- **Notes**: 24" column

- ** Tested By**: ________________________________

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U.L.1626.24 RESIDENTIAL FLOOR COLLECTION DATA
Coverage Area: 20' X 20'

Model: VK602  K = 8.0  Type: Recessed Pendent ECLH
Flow: 40 GPM  Test Duration: 20 Min.  Date: 11/15/2012
Frame Arms: Parallel  X  Perpendicular

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Floor Dist. Notes: No column

Average: 6.020  Low: 3.000  High: 

Tested By: 

Form RD-1033B
U.L.1626.24 RESIDENTIAL WALL WETTING DATA
Coverage Area 20’ X 20’

Model: VK602          K = 8.0          Type: Recessed Pendent ECLH          No column
Flow: 40 GPM          Test Duration: 10 Min.          Date: 11/15/2012
### U.L.1626.24 RESIDENTIAL FLOOR COLLECTION DATA

Coverage Area: 20' X 20'

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Frame Arms: [ ] Parallel  [x] Perpendicular

**Sprinkler Layout**

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5 8 10 8 8 8 6 8
6 8 2 2 4 5 6 10
7 12 19 4 0 0 2 3 4 10
6 12 17 8 2 0 0 1 3 10
5 11 11 6 4 0 0 0 1 8
4 8 6 4 4 2 0 0 0 6
4 6 6 4 4 3 1 0 0 2
11 13 15 11 7 8 6 3 1 0
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**Floor Dist. Notes:**

- 9" column

**Average:** 5.580
**Low:** 0.000
**High:**

**Tested By:** ___________________________

**Form:** RD-1033B
Model: VK602  K = 8.0  Type: Recessed Pendent ECLH
Flow: 40 GPM  Test Duration: 10 Min.  Date: 11/15/2012
**U.L.1626.24 RESIDENTIAL FLOOR COLLECTION DATA**

**Coverage Area** 20' X 20'

- **Model:** VK602  
- **K =** 8.0  
- **Type:** Recessed Pendent ECLH

- **Flow:** 40 GPM  
- **Test Duration:** 20 Min.  
- **Date:** 11/13/2012

- **Frame Arms:** _____ Parallel  **x** Perpendicular

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**Sprinkler Grid**

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**Floor Dist.**

- **Average:** 4.940
- **Low:** 0.000
- **High:**

**Notes:** 24" column

---

**Tested By:** ____________________________

---

**Form** RD-1033B
U.L.1626.24 RESIDENTIAL FLOOR COLLECTION DATA
Coverage Area 20' X 20'

Model: VK608  K = 11.2  Type: Recessed Pendent ECLH
Flow: 40 GPM  Test Duration: 20 Min.  Date: 11/15/2012

Frame Arms: Parallel  Perpendicular

Sprinkler

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Floor Dist.
Average: 5.500
Low: 2.000
High: ______

Notes: No column

Tested By: ____________________________

Form RD-1033B
Model: VK608  
K = 11.2  
Type: Recessed Pendent ECLH  
No column

Flow: 40 GPM  
Test Duration: 10 Min.  
Date: 11/15/2012

U.L.1626.24 RESIDENTIAL WALL WETTING DATA  
Coverage Area 20' X 20'

20"

40"

60"

80"

100"

30"
### U.L.1626.24 RESIDENTIAL FLOOR COLLECTION DATA

Coverage Area 20’ X 20’

**Model:** VK608  
**K =** 11.2  
**Type:** Recessed Pendent ECLH

**Flow:** 40 GPM  
**Test Duration:** 20 Min.  
**Date:** 11/15/2012

**Frame Arms:**  
- Parallel
- Perpendicular

**Sprinkler**

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**Floor Dist. Notes:**
- 9” column
  - Average: 5.430
  - Low: 0.000
  - High: _____

**Tested By:** __________________________

**Form:** RD-1033B
U.L.1626.24 RESIDENTIAL WALL WETTING DATA
Coverage Area 20' X 20'

Model: VK608  K = 11.2  Type: Recessed Pendent ECLH  9" column
Flow: 40 GPM  Test Duration: 10 Min.  Date: 11/15/2012
### U.L.1626.24 RESIDENTIAL FLOOR COLLECTION DATA

**Coverage Area**: 20' X 20'

**Model**: VK608  
**K**: 11.2  
**Type**: Recessed Pendent ECLH

**Flow**: 40 GPM  
**Test Duration**: 20 Min.  
**Date**: 11/14/2012

**Frame Arms**: Parallel [ ] Perpendicular [X]

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### Floor Dist.

- **Average**: 5.270
- **Low**: 0.000
- **High**: [ ]

**Notes**: 24" column

---

**Tested By**: ____________________________

---

**Form**: RD-1033B

---

32
## U.L.1626.24 RESIDENTIAL WALL WETTING DATA

Coverage Area: 20' X 20'

<table>
<thead>
<tr>
<th>Model</th>
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<tr>
<td>K</td>
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<tr>
<td>Type</td>
<td>Recessed Pendent ECLH</td>
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<tr>
<td>Flow</td>
<td>40 GPM</td>
</tr>
<tr>
<td>Test Duration</td>
<td>10 Min.</td>
</tr>
<tr>
<td>Date</td>
<td>11/14/2012</td>
</tr>
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</table>

Diagram showing wetting area with dimensions and flow rates.
15' x 15' Room
500 cfm
VK466 - 155F

<table>
<thead>
<tr>
<th>24&quot; Column</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>#1 - 42.1 sec</td>
<td></td>
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<td>#2 - 41.3 sec</td>
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<td>#3 - 42.1 sec</td>
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</table>

<table>
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<th>9&quot; Column</th>
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<tbody>
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<tr>
<td>#2 - 36.4 sec</td>
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<td>#3 - 38.1 sec</td>
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</tr>
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<td>#2 - 20.2 sec</td>
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<td>#3 - 19.7 sec</td>
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</tbody>
</table>

BURNER

x TC

-- SPK
15' x 15' Room
500 cfm
VK466 - 155F

**24" Column**
- #1 - 42.1 sec
- #2 - 41.3 sec
- #3 - 42.1 sec

41.8 Average in seconds

**9" Column**
- #1 - 37.3 sec
- #2 - 36.4 sec
- #3 - 38.1 sec

37.3 Average in seconds
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</tr>
<tr>
<td>#2 - 20.2 sec</td>
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<tr>
<td>#3 - 19.7 sec</td>
</tr>
</tbody>
</table>

19.9 Average in seconds
15' x 15' Room
160 cfm
VK466 - 155F

---

24" Column
300.1 sec
214.0 sec
283.6 sec
299.6 sec
295.0 sec
347.0 sec

Average in seconds: 289.9

9" Column
213.6 sec
232 sec
208 sec

Average in seconds: 217.9
89.6  Average in seconds
PART 6 –

NFPA 13R PUBLIC INPUT
For fire protection purposes, a system that consists of an integrated system network of underground and overhead piping designed in accordance with fire protection engineering standards. The installation includes one or more automatic water supplies that includes a water supply source, a water control valve, a waterflow alarm, and a drain and is commonly activated by heat from a fire, discharging water over the fire area. 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 valve controlling each system riser is located in the system riser or its supply piping. Each sprinkler system riser includes a device for actuating an alarm when the system is in operation. The system is usually activated by heat from a fire and discharges water over the fire area. [13 3.3.22]

Statement of Problem and Substantiation for Public Input

Correlate the definition of sprinkler system with NFPA 13 by extracting.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 10:47:18 EST 2012

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For fire protection purposes,

A system that consists of an integrated system

network of underground and overhead piping designed in accordance with fire protection engineering standards

The installation includes one or more automatic water supplies that includes a water supply source, a water control valve, a waterflow alarm, and a drain. The portion of the sprinkler system aboveground

above ground 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 valve controlling each system riser is located in the system riser or its supply piping. Each sprinkler system riser includes a device for actuating an alarm when the system is in operation. The system is usually

is commonly activated by heat from a fire and discharges water over the fire area.

Statement of Problem and Substantiation for Public Input

The definition of a sprinkler system is currently different between NFPA 13 & 13R. The changes proposed for NFPA 13R will make the definition consistent with NFPA 13.

Submitter Information Verification

Submitter Full Name: Terry Victor
Organization: Tyco/SimplexGrinnell
Submittal Date: Thu May 30 07:12:26 EDT 2013
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3.3.14 Thermal Barrier.
A material that limits the average temperature rise of an unexposed surface to not more than 250°F (121°C) for a specified fire exposure complying with the standard time–temperature curve of NFPA 251.

Delete this section. The term thermal barrier was in the standard to define what was required behind fixtures in bathrooms. This requirement was removed in the 2007 edition.

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 10:39:44 EST 2012

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Public Input No. 3-NFPA 13R-2012 [ Section No. 4.2 ]

4.2 Compartments—
See 3.3.2.

Statement of Problem and Substantiation for Public Input

Delete this section. I do not understand the need for this section. Is it common in any standard to have a section simply referring back to a definition?

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 10:55:15 EST 2012

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4.6 System Arrangement.

In townhouse-style buildings protected in accordance with this standard, each dwelling unit shall have its own dedicated sprinkler system or the control valves for the sprinkler system shall be located outside the dwelling units or in a common area.

Statement of Problem and Substantiation for Public Input

The use of the plural valves may cause some confusion. Since it says valves then it is implying that there are multiple valves per building. As long as the building meets the 52,000 square foot limitation, a single valve could control the system as long as it is located outside of the dwelling units.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submital Date: Tue Dec 11 10:56:12 EST 2012

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Public Input No. 5-NFPA 13R-2012 [New Section after 5.1.1.1]

5.1.1.1
When a sprinkler has been removed for any reason, it shall not be reinstalled.

Statement of Problem and Substantiation for Public Input
Add this new section to correlate with NFPA 13 and NFPA 25.

Submitter Information Verification
Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 10:59:07 EST 2012

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Public Input No. 6-NFPA 13R-2012 [ New Section after 5.1.1.1 ]

5.1.1.2

When replacing sprinklers that were installed when density requirements were less than the minimum 0.05 gpm/ft² (204 mm/min), a sprinkler with an equivalent K-factor (±.3) shall be permitted to be used without regards to the current listed flow and pressure requirements.

Statement of Problem and Substantiation for Public Input

Many times a building will have painted sprinklers or many of the sprinklers will need to be replaced based on NFPA 25 testing requirements. Many AHJ’s have been requiring that the building be re-calculated with the current day listings. Current day minimum pendent listings are 56% greater than the lowest listed density from the late 1990’s. Also, many times the plans or calculations are not available (even though required by NFPA 25). The wall wetting patterns have remained fairly consistent with residential sprinklers over time. Allowing replacement with a similar K-factor is reasonable in these situations.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 11:01:36 EST 2012

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/TerraView/Content/13R-2013.ditamap/2/C1355241696228.xml
5.1.1.4.3

Special sprinklers shall maintain the following characteristics:

1. Orifice size shall be in accordance with 5.1.1.3.
2. Temperature ratings shall be in accordance with Table 5.1.1.5.1.
3. The protection area of coverage shall not exceed 400 ft² (37 m²) for light hazard and ordinary hazard occupancies.

Statement of Problem and Substantiation for Public Input

The 400 ft² line in the sand has been in the standard for some time. The arguments against and for many proposals in NFPA 13D and 13R are many times based on cost (IE: attics). If a manufacturer can produce a product that effectively meets all the requirements as put forth by the listing laboratory, why should this standard restrict it? The laboratories will not test above this limitation until the requirement is removed from this standard and NFPA 13D. There is no need for this restriction.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 11:04:07 EST 2012

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Public Input No. 8-NFPA 13R-2012 [ Section No. 5.1.2.1 ]

5.1.2.1
Water meters and pressure-reducing valves that are combined with the domestic water installed in a combined domestic water and fire protection supply to the building shall not be required to be listed for fire protection.

Statement of Problem and Substantiation for Public Input

This change further clarifies that the devices are those installed in the combined piping supply line.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 11:06:43 EST 2012

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Public Input No. 49-NFPA 13R-2013 [ Section No. 5.2 ]

5.2 Aboveground Piping and Equipment.
5.2.1
Pipe or tube used in sprinkler systems shall be of the materials specified in Table 5.2.1 or in accordance with 5.2.2.

Table 5.2.1 Pipe or Tube Materials and Dimensions

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<thead>
<tr>
<th>Materials and Dimensions</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Specification for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use</td>
<td>ASTM A 795</td>
</tr>
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<td>Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless</td>
<td>ASTM A 53</td>
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<tr>
<td>Welded and Seamless Wrought Steel Pipe</td>
<td>ANSI B36.10M</td>
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<tr>
<td>Standard Specification for Seamless Copper Water Tube (Copper Tube [Drawn, Seamless])</td>
<td>ASTM B 88</td>
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<tr>
<td>Standard Specification for General Requirements for Wrought Seamless Copper and Copper-Alloy Tube</td>
<td>ASTM B 251</td>
</tr>
<tr>
<td>Standard Specification for Liquid and Paste Fluxes for Soldering Applications of Copper and Copper-Alloy Tube</td>
<td>ASTM B 813</td>
</tr>
<tr>
<td>Specification for Filler Metals for Brazing and Braze Welding (Classification BCuP-3 or BCuP-4)</td>
<td>AWS A5.8</td>
</tr>
<tr>
<td>Standard Specification for Solder Metal Section 1: Solder Alloys Containing Less than 0.2 percent lead (Pb) as identified in ASTM B 32, Table 5, Section 1, and having a solidus temperature that exceeds 400°F (204°C)</td>
<td>ASTM B 32, Table 5, Section 1, and having a solidus temperature that exceeds 400°F (204°C)</td>
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<td>Cast Bronze Threaded Fittings</td>
<td>ASME B16.15</td>
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<tr>
<td>Nonmetallic Piping</td>
<td></td>
</tr>
</tbody>
</table>

5.2.1.1
The chemical properties, physical properties, and dimensions of pipe materials shall be at least equivalent to the standards cited in Table 5.2.1.

5.2.1.2
Pipe shall be designed to withstand a working pressure of not less than 175 psi (12.1 bar).

5.2.1.3
When nonmetallic pipe is used, the pipe shall be designed to withstand a working pressure of not less than 175 psi (12.1 bar) at 120°F (49°C).

5.2.1.4
Nonmetallic pipe and fittings included in Table 5.2.1 and Table 5.2.9 shall be listed.

5.2.2
Types of pipe other than those specified in Table 5.2.1 shall be permitted to be used where listed for sprinkler system use.

5.2.2.1
Pipe differing from those specified in Table 5.2.1 shall be installed in accordance with their listings and the manufacturer's installation instructions.
5.2.2.2
Pipe or tube listed for light hazard occupancies shall be permitted to be installed in ordinary hazard rooms of otherwise light hazard occupancies where the room does not exceed 400 ft\(^2\) (37 m\(^2\)).

5.2.3*
Chlorinated polyvinyl chloride (CPVC) pipe shall comply with the portions of the American Society for Testing and Materials (ASTM) standards specified in Table 5.2.1 that apply to fire protection service

5.2.3.1
Nonmetallic pipe in accordance with Table 5.2.1 shall be investigated for suitability in automatic sprinkler installations and listed for this service.

5.2.3.1.1
Listed nonmetallic pipe shall be installed in accordance with its listing limitations, including installation instructions.

5.2.3.1.2
Manufacturer's installation instructions shall include its listing limitations.

5.2.3.2*
When nonmetallic pipe is used in combination systems utilizing steel piping internally coated with corrosion inhibitors and nonmetallic piping, the steel pipe coating shall be investigated for compatibility with the nonmetallic piping by a testing laboratory.

5.2.3.3
When nonmetallic pipe is used in combination systems utilizing steel pipe that is not internally coated with chemical corrosion inhibitors, no additional evaluations are required.

5.2.3.4
When nonmetallic pipe is used in combination systems utilizing steel pipe, cutting oils and lubricants used for fabrication of the steel piping shall be compatible with the nonmetallic pipe materials.

5.2.3.5
Fire-stopping materials intended for use on nonmetallic piping penetrations shall be investigated for compatibility with the nonmetallic pipe materials.

5.2.3.6
Nonmetallic pipe listed for light hazard occupancies shall be permitted to be installed in ordinary hazard rooms of otherwise light hazard occupancies where the room does not exceed 400 ft\(^2\) (37 m\(^2\)).

5.2.3.7
Nonmetallic pipe shall not be listed for portions of an occupancy classification.

5.2.4
Brass pipe specified in Table 5.2.1 shall be permitted in the standard weight in sizes up to 6 in. for gauge pressures up to 175 psi (12.1 bar) and in the extra strong weight in sizes up to 8 in. for gauge pressures up to 300 psi (20.7 bar).

5.2.5
Pipe with a wall thickness less than that of Schedule 30 pipe shall not be joined by fittings utilizing cut grooves where the pipe is 8 in. (203 mm) nominal or larger in size.

5.2.6
Pipe having a wall thickness less than that of Schedule 40 pipe shall not be joined by fittings utilizing cut grooves where the pipe is less than 8 in. (203 mm) nominal in size.
5.2.7
Pipe joined with mechanical fittings using cut or rolled grooves shall be joined by a listed combination of fittings, gaskets, and grooves.

5.2.8
Grooves cut or rolled on pipe shall be dimensionally compatible with the fittings.

5.2.9
Fittings used in sprinkler systems shall be of the materials listed in Table 5.2.9 or in accordance with 5.2.12.

Table 5.2.9 Fittings Materials and Dimensions

<table>
<thead>
<tr>
<th>Materials and Dimensions</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cast Iron</td>
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<tr>
<td>Gray Iron Threaded Fittings (Class 125 and 250)</td>
<td>ASME B16.4</td>
</tr>
<tr>
<td>Gray Iron Pipe Flanges and Flanged Fittings</td>
<td>ASME B16.1</td>
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<tr>
<td>Malleable Iron</td>
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<td>Malleable Iron Threaded Fittings</td>
<td>ASME B16.3</td>
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<td>Steel</td>
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<tr>
<td>Factory-Made Wrought Buttwelding Fittings</td>
<td>ASME B16.9</td>
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<tr>
<td>Buttwelding Ends</td>
<td>ASME B16.25</td>
</tr>
<tr>
<td>Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperatures</td>
<td>ASTM A 234</td>
</tr>
<tr>
<td>Pipe Flanges and Flanged Fittings (Nickel Alloy and Other Special Alloys)</td>
<td>ASME B16.5</td>
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<td>Forged Fittings, Socket-Welding and Threaded</td>
<td>ASME B16.11</td>
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<td>Copper</td>
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<td>Wrought Copper and Copper Alloy Solder Joint Pressure Fittings</td>
<td>ASME B16.22</td>
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<td>ASME B16.18</td>
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<td>CPVC</td>
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</tr>
</tbody>
</table>

5.2.9.1
The chemical properties, physical properties, and dimensions of fitting materials shall be at least equivalent to the standards cited in Table 5.2.9.

5.2.9.2
Fittings used in sprinkler systems shall be designed to withstand a working pressure of not less than 175 psi (12.1 bar).
5.2.9.3
When nonmetallic fittings are used, the fittings shall be designed to withstand a working pressure of not less than 175 psi (12.1 bar) at 120°F (49°C).

5.2.10
Joints for the connection of copper pipe shall be brazed on dry pipe and preaction systems.

5.2.11
Joints for the connection of copper pipe for wet systems shall use solder joints with 95-5 solder metal or be brazed.

5.2.12
Types of fittings other than those specified in Table 5.2.9 shall be permitted to be used where listed for sprinkler system use.

5.2.12.1
Fittings differing from those specified in Table 5.2.9 shall be installed in accordance with their listings and the manufacturer's installation instructions.

5.2.12.2
Nonmetallic fittings shall comply with the portions of the ASTM standards specified in Table 5.2.9 that apply to fire protection service.

5.2.12.2.1
Nonmetallic fittings in accordance with Table 5.2.9 shall be investigated for suitability in automatic sprinkler installations and listed for this service. Listed nonmetallic fittings shall be installed in accordance with their listing limitations, including installation instructions.

5.2.12.2.1.1
When nonmetallic fittings are used in combination systems utilizing internally coated steel piping and nonmetallic fittings, the steel pipe shall be investigated for compatibility with the nonmetallic fittings by a testing laboratory. Cutting oils and lubricants used for fabrication of the steel piping shall be compatible with the nonmetallic fitting materials.

5.2.12.2.1.2
When nonmetallic fittings are used in combination systems utilizing non–internally coated steel piping and nonmetallic fittings, no additional evaluations shall be required. Cutting oils and lubricants used for fabrication of the steel piping shall be compatible with the nonmetallic fitting materials.

5.2.12.2.1.3
Fire-stopping materials intended for use on nonmetallic fitting penetrations shall be investigated for compatibility with the nonmetallic fitting materials.

5.2.13
Welded pipe and fittings shall be permitted to be used in accordance with the rules of NFPA 13.

5.2.14 Valves.

5.2.14.1 General.

5.2.14.1.1 Valve Pressure Requirements.
When water pressures exceed 175 psi (12.1 bar), valves shall be used in accordance with their pressure ratings.

5.2.14.1.2 Valve Closure Time.
Unless the requirements of 6.8.5 apply, listed indicating valves shall not close in less than 5 seconds when operated at maximum possible speed from the fully open position.

5.2.14.1.3 Listed Indicating Valves.
Unless the requirements of 5.2.14.1.3.1, 5.2.14.1.3.2, or 5.2.14.1.3.3 are met, all valves controlling connections to water supplies and to supply pipes to sprinklers shall be listed indicating valves.

5.2.14.1.3.1
A listed underground gate valve equipped with a listed indicator post shall be permitted.

5.2.14.1.3.2
A listed water control valve assembly with a reliable position indication connected to a remote supervisory station shall be permitted.

5.2.14.1.3.3
A nonindicating valve, such as an underground gate valve with approved roadway box, complete with T-wrench, and where accepted by the authority having jurisdiction, shall be permitted.

5.2.14.2 Wafer-Type Valves.
Wafer-type valves with components that extend beyond the valve body shall be installed in a manner that does not interfere with the operation of any system components.

5.2.14.3 Drain Valves and Test Valves.
Drain valves and test valves shall be approved.

5.2.14.4* Identification of Valves.

5.2.14.4.1
All control, drain, and test connection valves shall be provided with permanently marked weatherproof metal or rigid plastic identification signs.

5.2.14.4.2
The identification sign shall be secured with corrosion-resistant wire, chain, or other approved means.

5.2.14.4.3
The control valve sign shall identify the portion of the building served.

5.2.14.4.4*
Systems that have more than one control valve that must be closed to work on a system or space shall have a sign referring to the existence and location of other valves.

5.2.14.5 Backflow Preventers.

5.2.14.5.1*
Backflow preventers shall be listed for fire protection service.

5.2.14.5.2
Backflow devices 2 in. (50 mm) in size or smaller shall be permitted in accordance with 6.8.5.

5.2.15 Gauges.

5.2.15.1
A pressure gauge with a connection not smaller than ¼ in. (6.4 mm) shall be installed at the system main drain, at each main drain associated with a floor control valve, and on the inlet and outlet side of each pressure-reducing valve.

5.2.15.2
Each gauge connection shall be equipped with a shutoff valve and provisions for draining.

5.2.15.3
The required pressure gauges shall be listed and shall have a maximum limit not less than twice the normal system working pressure at the point where installed.
5.2.15.4
Gauges shall be installed to permit removal and shall be located where they will not be subject to freezing.

See uploaded file.

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

Note: This Proposal originates from Tentative Interim Amendment 13R-13-1 (TIA 1055) issued by the Standards Council on August 9, 2012.

Revise Chapter 5 of NFPA 13R by changing the references to “CPVC” pipe and fittings to “nonmetallic” pipe and fittings. The exact words that need to be changed will depend on the section in order to be grammatically correct. The following is a list of the proposed changes, which will be followed by a draft of the affected sections:

1. 5.2.3.1, change “CPVC” to “nonmetallic”.
2. 5.2.3.1.1, change “CPVC” to “nonmetallic pipe”.
3. 5.2.3.2, change “CPVC” to “nonmetallic” the first two times in the section and then change “CPVC” to “the nonmetallic piping” the third time it appears in the section.
4. 5.2.3.3, change “CPVC” to “nonmetallic”.
5. 5.2.3.4, change “CPVC” to “nonmetallic” the first time it appears in the section and change “CPVC” to “the nonmetallic pipe” the second time it appears.
6. 5.2.3.5, change “CPVC” to “nonmetallic” the first time it appears in the section and change “CPVC” to “the nonmetallic pipe” the second time it appears.
7. 5.2.3.6, change “CPVC” to “Nonmetallic pipe” and change “CPVC” to “the nonmetallic pipe” the second time it appears.
8. 5.2.3.7, change “CPVC” to “Nonmetallic pipe”.
9. 5.2.3.8, change “CPVC” to “Nonmetallic pipe”.
10. 5.2.12.2.1, change “CPVC” to “Nonmetallic” the first time it appears in the section and “CPVC” to “nonmetallic fittings” the second time it appears.
11. 5.2.12.2.1.1, change “CPVC” to “nonmetallic” the first two times that it is used in the section, change “CPVC” to “the nonmetallic fittings” the third time it is used and change CPVC to “the nonmetallic fitting” the fourth time it is used.
12. 5.2.12.2.1.2, change “CPVC” to “nonmetallic” the first two times it appears in the section and change “CPVC” to “the nonmetallic fitting” the third time it appears.
13. 5.2.12.1.3, change “CPVC” to “nonmetallic fitting” the first time it appears in the section and change “CPVC” to “the nonmetallic fitting” the second time it appears.
14. 5.2.12.1.45.2.12.1.3, change “CPVC” to “nonmetallic fitting materials” the first time it appears in the section and change “CPVC” to “the nonmetallic fitting” the second time it appears.

The language, as inserted by the TCC after the ROC meetings has the potential to create an adverse impact on the manufacturers of a single nonmetallic pipe and fitting product when the situation intended to be addressed by the changes (compatibility of the product with other items in the system) needs to be addressed for all nonmetallic materials.

The compatibility of nonmetallic pipe with elements that could reasonably be expected to be in the water as well as external elements that the pipe could reasonably be expected to come into contact with needs to be evaluated for all nonmetallic pipe and fitting products that get used in fire sprinkler systems, not just a single material.
Unfortunately, due to the grammar of the sections, the acronym “CPVC” could not easily be substituted with the single word “nonmetallic” in all cases. But in each case where a substitution was made, the broader term of “nonmetallic pipe” or “nonmetallic fitting” was used in singular or plural form in order to make the section grammatically correct.

In sections Table 5.2.1 and Table 5.2.9 as well as sections 5.2.3, 5.2.12.2, “CPVC” has been intentionally left in the standard because it is a specific example of a type of pipe that is allowed under this section. In the annex sections, “CPVC” has been intentionally left in the text because these are statements of fact about a specific product.

Emergency Nature: Due to the potential adverse impact on a particular product, we believe that this TIA meets the definition of an “Emergency” under section 5.2(f) of the Regulations Governing Committee Projects.

Submitter Information Verification

Submitter Full Name: Kenneth Isman
Organization: National Fire Sprinkler Associ
Submittal Date: Fri Jan 25 11:19:16 EST 2013

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Public Input No. 57-NFPA 13R-2013 [ New Section after 5.2.2.2 ]

5.2.2.2.1 Non metallic pipe shall be permitted to be be used in garages greater than 400 ft² (37 m²) when the garage is sprinklered in accordance with 7.3.3.1.

Statement of Problem and Substantiation for Public Input

Since 7.3.3.1 allows residential sprinklers to protect these garages, it should be reasonable that listed non-metallic piping be allowed to be used.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Mar 26 13:41:14 EDT 2013

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5.2.3.2* When nonmetallic pipe is used in combination systems utilizing steel piping internally coated with corrosion inhibitors and nonmetallic piping, the steel pipe coating shall be investigated for compatibility with that particular steel piping as part of the nonmetallic piping by a testing laboratory listing.

Statement of Problem and Substantiation for Public Input

The sprinkler industry was hoodwinked in the 2013 cycle. There have been many failures of nonmetallic systems due to these corrosion inhibitors. There was an argument made that a very popular program by one of the CPVC resin manufacturers which published compatible pipe coatings, met the requirements of this section since they used a 3rd party testing laboratory. A TIA was pushed through and CAM’s were also guided through the floor process. Once this was accomplished, this manufacturer announced they would discontinue evaluating steel pipe coatings. Since this program is no longer available, it is up to the user or contractor to have the piping tested to determine compatibility. This language puts the onus on the nonmetallic piping manufacturer. It will be an incentive for them to produce a product that can be used with particular steel piping as a selling feature for their product.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 11:11:09 EST 2012

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/TerraView/Content/13R-2013.ditamap/2/C1355242269081.xml
Public Input No. 10-NFPA 13R-2012 [Section No. 5.2.3.4]

5.2.3.4
When nonmetallic pipe is used in combination systems utilizing steel pipe, cutting oils and lubricants used for fabrication of the steel piping shall be compatible with listed for compatibility with the nonmetallic pipe materials as part of the nonmetallic piping listing.

Statement of Problem and Substantiation for Public Input

The sprinkler industry was hoodwinked in the 2013 cycle. There have been many failures of nonmetallic systems due to these corrosion inhibitors. There was an argument made that a very popular program by one of the CPVC resin manufacturers which published compatible pipe coatings as well as compatible cutting oils, met the requirements of this section since they used a 3rd party testing laboratory. A TIA was pushed through and CAM’s were also guided through the floor process. Once this was accomplished, this manufacturer announced they would discontinue evaluating cutting oils. Since this program is no longer available, it is up to the user or contractor to have the cutting oil tested to determine compatibility. This language puts the onus on the nonmetallic piping manufacturer. It will be an incentive for them to produce a product that can be used with particular cutting oil or even develop their own as a selling feature for their product.

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Related Input

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Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 14:19:38 EST 2012

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Public Input No. 11-NFPA 13R-2012 [Section No. 5.2.3.7]

5.2.3.7
Nonmetallic pipe shall not be listed for portions of an occupancy classification.

Statement of Problem and Substantiation for Public Input

Currently there are specific listings for CPVC piping in garages which is a portion of the residential occupancy.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 14:23:13 EST 2012

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Public Input No. 13-NFPA 13R-2012 [New Section after 5.2.12.2.1]

5.2.12.2.1.3
When nonmetallic fittings are used in combination systems utilizing steel pipe, cutting oils and lubricants used for fabrication of the steel piping shall be listed for compatibility with the nonmetallic fittings as part of the nonmetallic fitting listing.

Statement of Problem and Substantiation for Public Input

The sprinkler industry was hoodwinked in the 2013 cycle. There have been many failures of nonmetallic systems due to these corrosion inhibitors. There was an argument made that a very
A popular program by one of the CPVC resin manufacturers which published compatible pipe coatings, met the requirements of this section since they used a 3rd party testing laboratory. A TIA was pushed through and CAM’s were also guided through the floor process. Once this was accomplished, this manufacturer announced they would discontinue evaluating steel pipe coatings. Since this program is no longer available, it is up to the user or contractor to have the piping tested to determine compatibility. This language puts the onus on the nonmetallic fitting manufacturer. It will be an incentive for them to produce a product that can be used with particular fluids as a selling feature for their product.

The Cutting oil and lubricant section was deleted and added in a separate section to mirror the format of the piping requirements and changes proposed to that section.

### Related Public Inputs for This Document

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### Submitter Information Verification

**Submitter Full Name:** Peter Schwab  
**Organization:** Wayne Automatic Fire Sprinkler  
**Submittal Date:** Tue Dec 11 14:34:51 EST 2012

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5.2.12.2.1.1
When nonmetallic fittings are used in combination systems utilizing steel piping, internally coated steel piping and with corrosion inhibitors and nonmetallic fittings, the steel pipe, the nonmetallic fittings, shall be investigated listed for compatibility with the nonmetallic fittings by a testing laboratory. Cutting oils and lubricants used for fabrication of the steel piping shall be compatible with steel piping as part of the nonmetallic fitting material listing.

Statement of Problem and Substantiation for Public Input

The sprinkler industry was hoodwinked in the 2013 cycle. There have been many failures of nonmetallic systems due to these corrosion inhibitors. There was an argument made that a very popular program by one of the CPVC resin manufacturers which published compatible pipe coatings, met the requirements of this section since they used a 3rd party testing laboratory. A TIA was pushed through and CAM’s were also guided through the floor process. Once this was accomplished, this manufacturer announced they would discontinue evaluating steel pipe coatings. Since this program is no longer available, it is up to the user or contractor to have the piping tested to determine compatibility. This language puts the onus on the nonmetallic fitting manufacturer. It will be an incentive for them to produce a product that can be used with particular steel piping as a selling feature for their product.

The wording was rearranged to match the piping section.

The Cutting oil and lubricant section was deleted and added in a separate section to mirror the format of the piping requirements and changes proposed to that section.

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Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 14:31:05 EST 2012

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5.2.12.2.1.2

When nonmetallic fittings are used in combination systems utilizing non–internally coated steel piping and nonmetallic fittings, no additional evaluations shall be required.

Cutting oils and lubricants used for fabrication of the steel piping shall be compatible with the nonmetallic fitting materials.

Statement of Problem and Substantiation for Public Input

The Cutting oil and lubricant section was deleted and added in a separate section to mirror the format of the piping requirements and changes proposed to that section.

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Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 14:40:13 EST 2012

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Public Input No. 15-NFPA 13R-2012 [New Section after 5.2.14]

5.2.14.6 Relief Valves

Wet pipe systems shall be provided with a listed relief valve not less than ½ in. (12 mm) in size set to operate at 175 psi (12.1 bar) or 10 psi (0.7 bar) in excess of the maximum system pressure, whichever is greater.

Statement of Problem and Substantiation for Public Input

Correlate the requirements for relief valves with NFPA 13.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 14:42:15 EST 2012

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Public Input No. 59-NFPA 13R-2013 [ Section No. 5.2.14.5.2 ]

5.2.14.5.2 –
Backflow devices 2 in. (50 mm) in size or smaller shall be permitted in accordance with 6.8.6.

Statement of Problem and Substantiation for Public Input

Listed backflow preventers with slow close control valves are currently available.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Fri Mar 29 08:51:25 EDT 2013

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Public Input No. 16-NFPA 13R-2012 [Section No. 5.2.15.3]

5.2.15.3
The required pressure gauges shall be listed, be approved, and shall have a maximum limit not less than twice the normal system working pressure at the point where installed.

Statement of Problem and Substantiation for Public Input

NFPA 13 no longer requires listed gauges. There is no reason that NFPA 13R should.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 14:44:17 EST 2012

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Public Input No. 17-NFPA 13R-2012 [ New Section after 5.4.1 ]

5.4.1.1

Listed dry pipe or preaction systems shall be permitted to be used where piping is installed in areas that can be maintained reliably above 40°F (4°C).

Statement of Problem and Substantiation for Public Input

There are occasions where an owner may be concerned about accidental activations and decide to go with a dry or preaction system. As currently written, NFPA 13R would not allow this if the temperatures are maintained above 40°F.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 14:46:01 EST 2012

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Public Input No. 47-NFPA 13R-2013 [ Section No. 5.4.2 ]
5.4.2*

Piping in areas that cannot be maintained reliably above 40°F (4°C) shall be protected by use of one of the following methods:

(1) * Antifreeze system using a listed antifreeze solution in accordance with NFPA 13

(2) Dry pipe system

(3) Preaction system

(4) Listed dry pendent, dry upright, or dry sidewall sprinklers extended from pipe in heated areas

(5) Heat tracing in accordance with 6.7.2.2

See uploaded file.

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

Note: This Proposal originates from Tentative Interim Amendment 13R-13-2 (TIA 1065) issued by the Standards Council on August 9, 2012.

The information provided in the Fire Protection Research Foundation report “Antifreeze Solutions Supplied through Spray Sprinklers: Interim Report” illustrates that under certain conditions (pressure, fire size, k-factor, ceiling height, deflector design…etc) a 50% glycerine solution is capable of igniting and causing a dramatic increase in heat release rate. As noted in the FPRF report, these results highlight the “complicated interaction between sprinkler spray and the ignition source.” As a result of this additional testing, there are more questions that need to be answered, and the testing shows that concentrations of anti-freeze that previous testing indicated were acceptable and would not support combustion actually do with a stronger ignition source. In addition, sprinklers with larger orifices that require lower pressure than typical residential sprinklers and potentially a larger droplet distribution also ignited. It is clear that further testing is need to fully understand under what conditions an anti-freeze solutions are safe, anti-freeze solutions can not be allowed in sprinkler systems.

Emergency Nature: The latest testing shows that anti-freeze concentrations currently allowed in sprinkler systems will support combustion and increase the size of the fire. This is a safety issue that requires changes in the standard.

Submitter Information Verification

Submitter Full Name: Terry Victor
Organization: Tyco/SimplexGrinnell
Submittal Date: Fri Jan 25 11:10:44 EST 2013

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5.4.2*

Piping in areas that Where any portion of a system is subject to freezing and the temperatures cannot be reliably maintained at or above 40°F (4°C), the system shall be protected by use of one of the following methods:

1. Antifreeze system using a listed antifreeze solution in accordance with NFPA 13
2. Dry pipe system
3. Preaction system
4. Listed dry pendent, dry upright, or dry sidewall sprinklers extended from pipe in heated areas
5. Heat tracing in accordance with 6.7.2.2

Statement of Problem and Substantiation for Public Input

There is a lack of consistency within NFPA 13R (see section 6.2.4.1 and 6.7.2.1) and NFPA 13 (see section 8.16.4.1.1) in stating when freeze protection is required. One should only require protection when the system has a freeze threat. Adequate precautions are provided by the requirement for heat loss calculations by a PE verifying the system will not freeze (as required by 13.8.16.4.1.5) and submitted separately. Text is from NFPA 13 8.16.4.1.1

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Submitter Information Verification

Submitter Full Name: Roland Huggins
Organization: American Fire Sprinkler Associ
Submittal Date: Tue Feb 26 15:00:04 EST 2013
Public Input No. 54-NFPA 13R-2013 [ New Section after 5.4.3 ]

TITLE OF NEW CONTENT

5.4.4 Water-filled piping shall be permitted to be installed in areas where the temperature is less than 40°F (4°C) when heat loss calculations performed by a professional engineer verify that the system will not freeze.

Statement of Problem and Substantiation for Public Input

This correlates with the criteria in NFPA 13 regarding providing freeze protection when an actual freeze threat exists. This text comes from NFPA 13:8.16.4.1.5

Submitter Information Verification

Submitter Full Name: Roland Huggins
Organization: American Fire Sprinkler Associ
Submittal Date: Tue Feb 26 15:42:44 EST 2013

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Public Input No. 18-NFPA 13R-2012 [ Section No. 6.2.1.1 ]

6.2.1.1
Listed residential sprinklers shall be used unless another type is permitted except as allowed by 6.2.1.3 or 6.2.1.4.

Statement of Problem and Substantiation for Public Input

When the NFPA 13R standard was created, there were concerns that in hotels and motels, residential sprinklers were not available in adequate patterns to reach the extents of some large rooms. Through research and development, there are now residential sprinklers that can spray as far as 26'-0". The wall wetting pattern of a residential sprinkler is far superior to that of a standard spray extended coverage sprinkler. It is time to retire this allowance.

Renumber 6.2.1.4 as 6.2.1.1.1
Delete sections 6.2.1.3, 6.2.1.3.1, 6.2.1.3.2
Section 7.1.2 is to be deleted as it only refers back to section 6.2.1.3.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 15:17:43 EST 2012

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/TerraView/Content/13R-2013.ditamap/2/C1355257063681.xml

Public Input No. 20-NFPA 13R-2012 [ Section No. 6.2.1.3 ]
Listed quick response sprinklers shall be permitted to be installed in dwelling units meeting the definition of a compartment, as defined in Section 3.3, where no more than four sprinklers are located in the dwelling unit.

6.2.1.3.1

Where quick response sprinklers, including extended coverage quick response sprinklers, are used, the density/area requirement shall be a minimum of 0.1 gpm/ft² (4.1 mm/min) over the entire dwelling unit.

6.2.1.3.2

Where extended coverage quick response sprinklers are used, the flow shall be sufficient to meet the listing of the sprinklers at the spacing for which they are being used.

Statement of Problem and Substantiation for Public Input

When the NFPA 13R standard was created, there were concerns that in hotels and motels, residential sprinklers were not available in adequate patterns to reach the extents of some large rooms. Through research and development, there are now residential sprinklers that can spray as far as 26'-0". The wall wetting pattern of a residential sprinkler is far superior to that of a standard spray extended coverage sprinkler. It is time to retire this allowance.

Renumber 6.2.1.4 as 6.2.1.1.1
Delete sections 6.2.1.3, 6.2.1.3.1, 6.2.1.3.2
Section 7.1.2 is to be deleted as it only refers back to section 6.2.1.3.

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Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 15:22:33 EST 2012

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Public Input No. 19-NFPA 13R-2012 [Section No. 6.2.1.4]

6.2.1.4—1.1
Quick-response sprinklers discharging a minimum of 0.1 gpm/ft² (4.1 mm/min) shall be permitted to be used in mechanical closets.

Statement of Problem and Substantiation for Public Input

When the NFPA 13R standard was created, there were concerns that in hotels and motels, residential sprinklers were not available in adequate patterns to reach the extents of some large rooms. Through research and development, there are now residential sprinklers that can spray as far as 26'-0". The wall wetting pattern of a residential sprinkler is far superior to that of a standard spray extended coverage sprinkler. It is time to retire this allowance.

Renumber 6.2.1.4 as 6.2.1.1.1
Delete sections 6.2.1.3, 6.2.1.3.1, 6.2.1.3.2
Section 7.1.2 is to be deleted as it only refers back to section 6.2.1.3.

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Submitter Information Verification

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<td>Wayne Automatic Fire Sprinkler</td>
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Public Input No. 23-NFPA 13R-2012 [ New Section after 6.2.2 ]

6.2.2.5

Residential sprinklers shall be permitted to be used in all light hazard areas where the ceiling height does not exceed 10'-0" (3.1 m).

6.2.2.5.1

The density for sprinklers installed in accordance with 6.2.2.5 shall be in accordance with 7.1.1.

Statement of Problem and Substantiation for Public Input

This language was deleted on the floor by CAM 13R-6 in the 2012 annual convention. The major concern expressed by the proponent of the CAM was the possibility of high ceilings that could exist in these light hazard areas. The discussion for this motion began in the NFSA E&S committee and the manufacturers in that meeting were very comfortable with residential sprinklers in light hazard areas provided the ceiling height was 10'-0" or less.

In regards to compartment size, the current 6.4.7 does not provide any guidance in regards to compartment size. For instance, 6.4.7 (1) and (5) are areas that can very easily exceed 600 square feet. The study that was cited in the argument was performed with sloped and beam sloped ceilings up to 24'-0" high.

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Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 15:37:32 EST 2012

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Public Input No. 22-NFPA 13R-2012 [ Section No. 6.2.2.2 ]

6.2.2.2
Sprinklers outside the dwelling units shall be quick-response, except as allowed by 6.2.2.3, and 6.2.2.4 and 6.2.2.5.

Statement of Problem and Substantiation for Public Input

This language was deleted on the floor by CAM 13R-6 in the 2012 annual convention. The major concern expressed by the proponent of the CAM was the possibility of high ceilings that could exist in these light hazard areas. The discussion for this motion began in the NFSA E&S committee and the manufacturers in that meeting were very comfortable with residential sprinklers in light hazard areas provided the ceiling height was 10'-0" or less. In regards to compartment size, the current 6.4.7 does not provide any guidance in regards to compartment size. For instance, 6.4.7 (1) and (5) are areas that can very easily exceed 600 square feet. The study that was cited in the argument was performed with sloped and beam sloped ceilings up to 24'-0" high.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 15:35:07 EST 2012

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Public Input No. 25-NFPA 13R-2012 [Section No. 6.4.6.1.3]

6.4.6.1.3

Except as permitted by 6.4.6.3.2 pendent and upright sprinklers shall be located a minimum of 4 in. (102 mm) from a wall.

Statement of Problem and Substantiation for Public Input

Removes a conflict from the standard.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 16:31:04 EST 2012

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6.4.6.3.2 *  Within Closets.
In all closets and compartments, including those closets housing mechanical equipment, that are not larger than 400 ft$^3$ (11.33 m$^3$) in size, a single sprinkler at the highest ceiling space, ceiling level, shall be sufficient without regard to obstructions or minimum distance to the wall.

Statement of Problem and Substantiation for Public Input

Level is a more appropriate term.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Mar 26 10:35:58 EDT 2013

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Public Input No. 45-NFPA 13R-2013 [ New Section after 6.4.6.3.4.1 ]

6.4.6.3.4.1.1
Pendent sprinklers shall be spaced in accordance with 6.4.6.3.6 when installed adjacent to ceiling mounted fluorescent light fixtures.

Statement of Problem and Substantiation for Public Input

The original testing for obstructions to residential sprinklers was performed with ceiling fans. Generally a ceiling fan will have a rosette or circular ceiling flange. When a fluorescent light is present they are usually 4" deep and are rectangular in nature. Common dimensions are 12" x 48" or 24" x 48". If you measure from the center out, there can still be an obstruction that is only 12" from the sprinkler if it is spaced 36" from the center of the light. In this case the beam rule is more appropriate.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Jan 15 13:21:40 EST 2013

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Public Input No. 65-NFPA 13R-2013 [ New Section after 6.4.6.3.4.4 ]

6.4.6.3.4.5

Fans installed with the blades and the motor greater than 18 in (0.46 m) below the sprinkler deflector shall not be considered obstructions.

Statement of Problem and Substantiation for Public Input

When a ceiling fan is installed on a rod and hangs down from the ceiling, it will not create an obstruction to the development of the spray pattern.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Thu May 02 09:59:53 EDT 2013

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Public Input No. 58-NFPA 13R-2013 [ Section No. 6.4.6.3.6.3 ]
6.4.6.3.6.3
Sprinklers shall be positioned with respect to an obstruction against a wall in accordance with Figure 6.4.6.3.6.3 (a) or Figure 6.4.6.3.6.3 (b).

**Figure 6.4.6.3.6.3 Positioning** (a) Positioning of Sprinkler to Avoid Obstruction Against Wall (Residential Upright and Pendent Spray Sprinklers).

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

Guidance is needed for soffits against walls when there is a sloped ceiling.

Submitter Information Verification

**Submitter Full Name:** Peter Schwab  
**Organization:** Wayne Automatic Fire Sprinkler  
**Submittal Date:** Tue Mar 26 15:19:24 EDT 2013

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FIGURE 6.4.6.3.6.3(b) Positioning of Sprinkler to Avoid Obstructions Against \(^1\) (Residential Upright and Pendent Spray Sprinklers)

\[ A \geq (D-8\text{ in.}) + B \]
\[ [A \geq (D-0.2\text{ m}) + B] \]
where \(D<30\text{ in.} \text{ (0.8 m)}\)
6.4.7 Use of Residential Sprinklers Outside of Dwelling Units.
The following types of spaces shall be permitted to be protected by residential sprinklers in accordance with Section 7.4:

1. Lobbies not in hotels and motels
2. Foyers
3. Corridors
4. Halls
5. Lounges
6. Other areas with fire loads similar to residential fire loads

Statement of Problem and Substantiation for Public Input

This language was deleted on the floor by CAM 13R-6 in the 2012 annual convention. The major concern expressed by the proponent of the CAM was the possibility of high ceilings that could exist in these light hazard areas. The discussion for this motion began in the NFSA E&S committee and the manufacturers in that meeting were very comfortable with residential sprinklers in light hazard areas provided the ceiling height was 10'-0" or less.

In regards to compartment size, the current 6.4.7 does not provide any guidance in regards to compartment size. For instance, 6.4.7 (1) and (5) are areas that can very easily exceed 600 square feet. The study that was cited in the argument was performed with sloped and beam sloped ceilings up to 24'-0" high.

Also, this section is out of place and should be addressed in 6.2.2.

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Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 15:42:02 EST 2012
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Public Input No. 74-NFPA 13R-2013 [ New Section after 6.5.3 ]

6.5.4 Sprinkler Protected Glazing.

6.5.4.1 Where sprinklers are used in combination with glazing as an alternative to a fire-rated wall or window assembly, the sprinkler protected assembly shall comply with the following:

1. Sprinklers shall be listed as specific application window sprinklers.
2. Sprinklers shall be supplied by a wet-pipe system.
3. Glazing shall be heat-strengthened or tempered and shall be fixed.
4. The sprinkler protected assembly shall pass a fire test that demonstrates protection for a duration equivalent to the required fire rating. The sprinkler protected assembly test shall be based on the natural gas flow rate curve required to generate a time-temperature relationship as specified in ASTM E119 and UL 263.
5. Where the rated wall or window assembly is required to be rated for a fire exposure from both sides, sprinklers shall be installed on both sides of the glazing.
6. The use of sprinkler protected glazing as an alternative to a fire-rated wall assembly shall be limited to non-load bearing walls.

The glazed wall assembly shall not have any horizontal members that would interfere with uniform distribution of water over the surface of the glazing, and there shall be no obstructions between sprinklers and glazing that would obstruct water distribution.

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input
Sprinkler protected glazing has been permitted in atriums, exterior walls and other applications approved by code officials for more than 20 years. Recent actions in building codes have attempted to diminish the permissible use of these assemblies, and by providing specific provisions in NFPA 13 or NFPA 13R (proposals have been submitted to both standards), questions regarding the lack of appropriate installation requirements would be resolved. The proposed provisions are consistent with limitations currently in place in building codes and established by UL and ICC-ES.

Submitter Information Verification

Submitter Full Name: Jeffrey Shapiro
Organization: International Code Consultants
Affiliation: Tyco Fire Protection Products
Submittal Date: Tue Jun 04 09:29:19 EDT 2013

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Public Input No. 42-NFPA 13R-2012 [New Section after 6.6.3]

6.6.3.1

For closets with angled or irregularly shaped walls, the least dimension shall be measured based on an implied rectangular shape.

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

There are some closets found in apartment buildings that are comprised of angled walls. The way the standard is written, one would take the least dimension. The assumption in my opinion is that this is meant for a closet with (2) dimensions. (Length times width). The attached picture is an example of just such a situation that I believe is not addressed by the standard. The least dimension in this closet would be 1'-3" thus excluding it from needing sprinklers.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 18 15:56:40 EST 2012

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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 elevator shafts surfaced with a noncombustible or limited combustible finish 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 not intended for living purposes or storage and do not contain fuel-fired equipment.

Statement of Problem and Substantiation for Public Input

Many 13R buildings are constructed of wood. The requirements for ratings sometimes allow wood construction of an elevator shaft with a noncombustible or limited combustible finish. This should be sufficient to meet the scope of the standard (life safety). The other change is to delete the term used. This is an installation standard and is utilized up to the point of occupancy. The user of the standard can only design and install a system for what is intended.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 16:32:48 EST 2012

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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 elevators, elevator shafts where the elevator cars comply installation complies 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.

Statement of Problem and Substantiation for Public Input

If an elevator installation is in compliance with the elevator code, that should be enough for us to allow the sprinkler to be omitted in an NFPA 13R situation. The elevator code will allow wood frame construction covered by several layers of gypsum board for certain types of construction in low rise occupancies. While this construction is not "noncombustible", it will achieve a one-hour or two-hour rating and should be sufficient for omission of sprinklers.

Submitter Information Verification

Submitter Full Name: Roland Asp
Organization: National Fire Sprinkler Association
Affiliation: NFSA E&S Committee
Submit Date: Fri May 24 15:12:09 EDT 2013

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6.6.7
Sprinklers shall not be required in closets (regardless of size) on exterior balconies and exterior breezeways/corridors, regardless of size, as long as the closet does not have doors or unprotected penetrations directly into the dwelling unit.

Statement of Problem and Substantiation for Public Input

The term open should be used versus exterior as the annex clarifies what open is. “Regardless of size” is repeated and should be deleted.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 16:35:12 EST 2012

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/TerraView/Content/13R-2013.ditamap/2/C1355261712945.xml
6.6.7
Sprinklers shall not be required in closets (regardless of size) on exterior balconies and exterior breezeways/corridors, and garages, regardless of size, as long as the closet does not have doors or unprotected penetrations directly into the dwelling unit.

Statement of Problem and Substantiation for Public Input

The garages are typically not conditioned. If a closet is provided in a garage, the piping may be subject to freezing. The closets cannot contain fuel-fired equipment otherwise sprinklers would be required. A fire that would occur inside the closet(s) will be contained by sprinkler(s) protecting the garages.

Submitter Information Verification

Submitter Full Name: Thomas Wellen
Organization: American Fire Sprinkler Association
Submittal Date: Fri May 31 15:36:58 EDT 2013

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Public Input No. 44-NFPA 13R-2013 [ New Section after 6.7.2.2 ]

A.6.7.2.2.2

The standards for the listing of heat tracing should include the supervision of the following items:

(1) Ground Fault
(2) Low System Temperature
(3) High System Temperature
(4) Temperature Sensor failure
(5) Primary Controller Failure
(6) Electrical Continuity
(7) Loss of Incoming Supply Voltage
(8) Engagement of Secondary Controller

Statement of Problem and Substantiation for Public Input

This language correlates with NFPA 14. Similar PI will be submitted to NFPA 13. If heat tracing is to be used, this is very good guidance as to what the listing should encompass.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Fri Jan 11 15:51:45 EST 2013

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Where listed heat tracing systems are used, they shall be supervised by one of the following methods:

1. Central station, proprietary or remote station signaling service.
2. Local signaling service that will cause a signal at a constantly attended location.

Statement of Problem and Substantiation for Public Input

This will coordinate with NFPA 14. Similar PI will be sent to NFPA 13.

Submitter Information Verification

Submitter Full Name: Peter Schwab  
Organization: Wayne Automatic Fire Sprinkler  
Submittal Date: Fri Jan 11 15:46:08 EST 2013

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Public Input No. 71-NFPA 13R-2013 [ New Section after 6.8 ]

Floor Control Valve Assemblies

x.x.1. Multistory buildings exceeding two stories in height shall be provided with a floor control valve, check valve, main drain valve, and flow switch for isolation, control, and announcement of water flow on each floor level.

x.x.2. The floor control valve, check valve, main drain valve, and flow switch required by x.x.1 shall not be required where sprinklers on the top level of a multistory building are supplied by piping on the floor below.

x.x.3 The floor control valve, check valve, main drain valve, and flow switch required by x.x.1 shall not be required where the total area of all floors combined does not exceed the system protection area limitations of x.x.x.

Statement of Problem and Substantiation for Public Input

This language requiring floor control assemblies in multistory building was added in the 2013 edition of NFPA 13 and should be included in NFPA 13R. The installation of floor control assemblies allows for better announcement in the event of a fire, and for better maintenance, allowing single floors to be shut down without affecting others.

Submitter Information Verification

Submitter Full Name: Terry Victor
Organization: Tyco/SimplexGrinnell
Submittal Date: Thu May 30 07:35:59 EDT 2013

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6/26/13

Public Input No. 61-NFPA 13R-2013 [Section No. 6.8.4]

Statement of Problem and Substantiation for Public Input

Currently there are listed backflow preventers with slow close control valves available.

Related Public Inputs for This Document

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Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Fri Mar 29 09:02:14 EDT 2013

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/TerraView/Content/13R-2013.ditamap/2/C1364562134418.xml
Public Input No. 60-NFPA 13R-2013 [Section No. 6.8.5]

6.8.5 –

System control or shutoff valves on backflow prevention devices that are 2 in. (50 mm) or less in nominal size shall not be required to comply with: 6.8.4.

Statement of Problem and Substantiation for Public Input

Currently listed backflow preventers are available on the market with slow close control valves.

Related Public Inputs for This Document

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Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Fri Mar 29 09:00:31 EDT 2013

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Public Input No. 29-NFPA 13R-2012 [ New Section after 6.9 ]

6.9.5

Auxiliary drains shall not be required on wet systems.

Statement of Problem and Substantiation for Public Input

The handbook commentary has stated for several cycles that it is not the intent of NFPA 13R to require auxiliary drains. With birdcage systems and vertical supplies to sidewalls up and down, requiring auxiliary drains would be costly.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 16:38:29 EST 2012

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Public Input No. 28-NFPA 13R-2012 [ Section No. 6.9.2 ]

6.9.2
The drain pipe shall be at least 1 in. (25 mm) nominal diameter and shall be arranged so that it can drain all portions of the system.

Statement of Problem and Substantiation for Public Input

The term open should be used verses exterior as the annex clarifies what open is. “Regardless of size” is repeated and should be deleted.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 16:37:09 EST 2012

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/TerraView/Content/13R-2013.ditamap/2/C1355261829427.xml
Public Input No. 30-NFPA 13R-2012 [ New Section after 6.11 ]

6.11.5

Fire department connections shall be permitted to connect to the underground piping dedicated to the sprinkler system.

Figure A.6.11.5

Add Figure A.8.17.2.4.4(a) from NFPA 13

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

Many AHJ’s require remote fire department connections on 13R systems. AHJ’s sometimes require that this connection be on the system side of the control valve and will not permit and valves downstream of the FDC in the system piping. This illustration from NFPA 13 makes it clear that this arrangement is permissible.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 16:48:09 EST 2012

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/TerraView/Content/13R-2013.ditamap/2/C1355262489789.xml
FIGURE A.8.17.2.4.4(a)  Fire Department Connection Connected to Underground Piping (Sample 1).
6.11.5 Fire department connections shall have an approved method to deter unauthorized removal of the FDC.

Statement of Problem and Substantiation for Public Input

There is a serious problem with theft of fire department connections for scrap metal. A missing FDC is a system impairment.

Submitter Information Verification

Submitter Full Name: Bill Galloway
Organization: Southern Regional Fire Code De
Submittal Date: Tue Mar 12 13:11:15 EDT 2013

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Public Input No. 66-NFPA 13R-2013 [ New Section after 6.16.4 ]

6.17

**Backflow Prevention Valves.** Means shall be provided downstream of all backflow prevention valves for flow tests at system design flow rate.

**Statement of Problem and Substantiation for Public Input**

Backflow valves need to be exercised, even when they are on NFPA 13R systems. This is one of the rules from NFPA 13 that needs to be moved into NFPA 13R.

**Submitter Information Verification**

**Submitter Full Name:** Roland Asp  
**Organization:** National Fire Sprinkler Association  
**Affiliation:** NFSA E&S Committee  
**Submittal Date:** Fri May 24 14:52:12 EDT 2013

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/TerraView/Content/13R-2013.ditamap/2/C1369421532885.xml
Public Input No. 31-NFPA 13R-2012 [ Section No. 6.16.4 ]

6.16.4
Where a building fire alarm system is or a dedicated function fire alarm system is provided, the building fire sprinkler system shall not be required to be zoned by floor.

Statement of Problem and Substantiation for Public Input

There are many times when an NFPA 13R occupancy will not be required to have a fire alarm system. Some building codes do require however that the sprinkler system be monitored so the definition for a monitoring system as taken from NFPA 72 has been added.

Submitter Information Verification

Submitter Full Name: Peter Schwab  
Organization: Wayne Automatic Fire Sprinkler  
Submittal Date: Tue Dec 11 16:55:27 EST 2012

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Public Input No. 32-NFPA 13R-2012 [ New Section after 7.1.1.3 ]

7.1.1.3.2

Listed flows associated with testing under a smooth, flat, horizontal 8 ft (2.44 m) high ceiling shall be permitted to be used for the ceiling configurations referenced in 7.1.1.3.1.

Statement of Problem and Substantiation for Public Input

Add this language to be consistent with NFPA 13D and make it clear that the smooth ceiling, flat 8'-0" high ceiling criteria applies.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 16:57:26 EST 2012

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7.1.2 Quick-Response Sprinklers.

Where quick-response sprinklers are used in accordance with Section 6.2.1.3, the discharge and design area requirements of NFPA 13 shall apply.

Statement of Problem and Substantiation for Public Input

When the NFPA 13R standard was created, there were concerns that in hotels and motels, residential sprinklers were not available in adequate patterns to reach the extents of some large rooms. Through research and development, there are now residential sprinklers that can spray as far as 26'-0". The wall wetting pattern of a residential sprinkler is far superior to that of a standard spray extended coverage sprinkler. It is time to retire this allowance.

Renumber 6.2.1.4 as 6.2.1.1.1
Delete sections 6.2.1.3, 6.2.1.3.1, 6.2.1.3.2
Section 7.1.2 is to be deleted as it is specific to section 6.2.1.3 which is proposed to be deleted.

Related Public Inputs for This Document

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Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 15:31:22 EST 2012

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/TerraView/Content/13R-2013.ditamap/2/C1355257882252.xml
Garages that are accessible only from a single dwelling unit, or considered private garages under the applicable building code, shall be considered as part of that dwelling unit.

Statement of Problem and Substantiation for Public Input

Addition to the code text will clarify and correlate NFPA 13R requirements for private garages used by only a tenant of a dwelling unit with the model building codes that have special requirements for "private garages" that serve the same purpose as intended under Section 7.3.3's requirement. The definition and requirements for private garages under the NFPA 5000 and IBC Codes permit small private garages for individual tenants (up to 1000 sq. ft per private garage). Under the existing wording of Section 7.33 the text states the the garage shall only accessible from a single dwelling unit. However, many modern designs of some of the apartment buildings have some of their single/double car private garages on the ground level of the building that are only accessible to the tenant that rents that individual, separated private garage space but are not directly connected to the tenant's dwelling unit which may be located on an upper floor of the apartment building. The private garage may not be "accessible only from a single dwelling unit", but for all intended purposes it is identical in its use by the tenant of a dwelling unit in the apartment building who has the only access (i.e. by way of a key locked door from the common exit access corridor) to that private garage space.

Submitter Information Verification

Submitter Full Name: Marshall Klein
Affiliation: National Multi-Housing Council (NMHC)
Submittal Date: Fri Feb 01 10:40:04 EST 2013

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/TerraView/Content/13R-2013.ditamap/2/C1359733204170.xml
Public Input No. 33-NFPA 13R-2012 [ Section No. 8.1.2 ]

8.1.2
Deviations from approved plans shall require permission of the authority having jurisdiction.

Statement of Problem and Substantiation for Public Input

The way this section is currently worded, the user cannot make any modifications until the AHJ has given their permission. There are many times in the field where modifications occur and as builts are created and resubmitted to the AHJ. This language allows approval of these changes after the fact which is real world.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 16:59:19 EST 2012

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Public Input No. 64-NFPA 13R-2013 [ Section No. 8.1.7 ]

8.1.7
Sprinkler plans shall indicate the following:

(1) Name of owner and occupant
(2) Location, including street address
(3) Point of compass

(4) Ceiling construction

(5) Full height cross-section or schematic diagram, including structural member information if required for clarity and including ceiling construction and method of protection for nonmetallic piping

(6) Ceiling/roof heights and slopes not shown in the full height cross section.

(7) Location of fire walls

(8) **Location of partitions**  
Occupancy of each area or room

(9) *Lintels, and doorways. Lintel openings require a cross section view to indicate the area of the opening.*

(10) Occupancy, label, and name of all area or rooms

(11) Location and size of concealed spaces, attics, closets, and bathrooms

(12) Any small enclosures in which no sprinklers are to be installed

(13) Size of the city main in the street; pressure; whether dead-end or circulating and, if dead-end, the direction and distance to the nearest circulating main; and the city main test results including elevation of the test hydrant

(14) **Make, manufacturer, type, heat-response element, temperature rating, sprinkler identification number, and nominal K-factor, number of sprinklers installed, and nominal orifice size of the sprinkler**

(15) **Temperature rating**

(16) Number of sprinklers on each riser, per floor

(17) Kind and location of alarm bells

(18) **horns/strobes**

(19) **Type of pipe and fittings**

(20) **Pipe type and schedule of wall thickness.**

(21) **Type of protection for nonmetallic pipe**

(22)* Nominal pipe size with lengths shown to scale

(23) Location and size of riser nipples

(24) Types of fittings and joints and the locations of all welds and bends

(25) **Types and locations of hangers, sleeves, and braces, and methods of securing sprinklers, where applicable**

(26) **All control valves, check valves, drain pipes, and test connections**

(27) **Underground pipe size, length, location, weight, material, and point of connection to the city main; type of valves, meters, and valve pits; and depth at which the top of the pipe is laid below grade**

(28) **In the case of hydraulically designed systems, the material to be included on the hydraulic data nameplate**

(29) **Name and address of the contractor sprinkler contractor**

(30) Where required by the AHJ, documentation of the designer credentials.
General notes as required by the AHJ.

Approximate capacity in gallons of each dry pipe system.

Make, type, model, and size of alarm or dry pipe valve.

Piping provisions for flushing

Where the equipment is to be installed as an addition to an existing system, enough of the existing system indicated on the plans to make all conditions clear.

A graphic representation of the scale used on all plans.

Hydraulic reference points shown on the plan that correspond with comparable reference points on the hydraulic calculation sheets.

The minimum rate of water application (density or flow or discharge pressure), the design area of water application, and the domestic demand.

The total quantity of water and the pressure required noted at a common reference point for each system.

Relative elevations of sprinklers, junction points, and supply or reference points.

Information about backflow preventers (manufacturer, size, type).

Information about antifreeze solution used (type and amount).

Size and location of hydrants, showing size and number of outlets. Static and residual hydrants that were used in flow tests shall be shown.

Size, location, and piping arrangement of fire department connections.

Location of fuel-fired equipment and heating and air-conditioning equipment.

Location of closets on exterior balconies, and a note indicating whether there is any type of door or penetration between the closet and the dwelling unit.

Edition year of NFPA 13R to which the sprinkler system is designed. Utility plans and/or plumbing plans necessary to show connection from water supply to fire sprinkler system.

Statement of Problem and Substantiation for Public Input

There is little difference in the basic details of information expected to be shown on sprinkler plans submitted to the AHJ, regardless of whether the system is 13D, 13R, or 13 design. However, these three codes have drastically different lists of required information. The intent of this amendment is to update the list of items required on plans so that submittals for 13-R systems are similar to submittals for 13 systems. During design review we need to ask these questions and adding them to the list reduces the number of times we need to go back and forth between plan review and installer. Adding them to the list will reduce plan review times and assist the user and installer.

Submitter Information Verification

Submitter Full Name: Kelly Nicolello
Organization: Western Regional Fire Code Dev
Submittal Date: Tue Apr 16 16:44:06 EDT 2013
Public Input No. 34-NFPA 13R-2012 [ Section No. 9.7 ]

9.7 Non-Fire Protection Connections.
Sprinkler systems with non-fire protection connections shall comply with Section 7.7 of NFPA 13: shall not be permitted.

Statement of Problem and Substantiation for Public Input

NFPA 13R systems are life safety systems and should not be connected with other types of systems that may contain devices that are not reliable. The types of occupancies where these systems are installed are generally not residential in nature. Since these are such rare situations, this practice in NFPA 13R occupancies should be prohibited.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 17:00:30 EST 2012

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11.1.3.1
Where all sprinklers installed on the system are intermediate temperature or higher, the cabinet shall be located where the temperature to which they are subjected will at no time exceed 150°F (66°C).

Statement of Problem and Substantiation for Public Input
NFPA 13R allows intermediate temperature sprinklers to be installed throughout residential occupancies. If the project only contains intermediate temperature sprinklers, the cabinet should not be forced to be kept in a 100° maximum space.

Submitter Information Verification
Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 17:01:42 EST 2012

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Public Input No. 36-NFPA 13R-2012 [ Section No. A.1.1 ]
A.1.1
NFPA 13R is appropriate for use as an option to NFPA 13 only in those residential occupancies, as defined in this standard, up to and including four aboveground stories in height, and limited to buildings that are 60 ft (18 m) or less in height above grade plane, which is consistent with limits established by model building codes for buildings of Type V construction. The height of a building above grade plane is determined by model building codes, which base the height on the average
height of the highest roof surface above grade plane. For further information on the building height story limits, see model building codes.

It is the intent of this standard that if NFPA 13R is appropriate for use, it be used throughout the entire building. It is recognized that an accessory or incidental occupancy to the operations of the residential occupancy might exist within that residential occupancy.

Such accessory or 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 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. Examples of accessory occupancies found in NFPA 13R installations can include parking garages/areas, community laundry rooms, clubhouses, exercise facilities, tenant storage, and spaces, maintenance rooms, storage rooms, leasing offices, lobbies, community gathering spaces, small conference rooms, small gift shops, and so forth.

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 expected to prevent flashover within the compartment of origin where sprinklers are installed in the compartment. A sprinkler system designed and installed according to this standard cannot, however, be expected to completely control a fire involving fuel loads that are significantly higher than average for dwelling units (10 lb/ft² (49 kg/m²)), configurations of fuels other than those with typical residential occupancies, or conditions where the interior finish has an unusually high flame spread index (greater than 225).

To be effective, sprinkler systems installed in accordance with this standard need to open the sprinklers closest to the fire before the fire exceeds the ability of the sprinkler discharge to extinguish or control the fire. Conditions that allow the fire to grow beyond that point before sprinkler activation or that interfere with the quality of water distribution can produce conditions beyond the capabilities of the sprinkler system described in this standard. Unusually high ceilings or ceiling configurations that tend to divert the rising hot gases from sprinkler locations or change the sprinkler discharge pattern from its standard pattern can produce fire conditions that cannot be extinguished or controlled by the systems described in this standard.

NFPA 13R references NFPA 13 in many aspects (hanging and bracing, design densities and spacing outside of dwelling unit, painting and finish of sprinklers, welding, etc.). If this standard does not specifically address a situation, NFPA 13 is a good resource that can be utilized by the installer and the authority having jurisdiction for a solution. It is not the intent of this standard to require compliance with NFPA 13 when NFPA 13R is silent on a subject. Only AHJ approval should be
required.

**Figure A.1.1(a) Bedroom.**

**Figure A.1.1(b) Manufactured Home Bedroom.**

**Figure A.1.1(c) Living Room.**

Statement of Problem and Substantiation for Public Input

Proposed language adds more examples to the list.

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submittals.nfpa.org/TerraViewWeb/ViewerPage.jsp
Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 17:03:12 EST 2012

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Public Input No. 46-NFPA 13R-2013 [ Section No. A.1.1 ]

A.1.1

NFPA 13R is appropriate for use as an option to NFPA 13 only in those residential occupancies, as defined in this standard, up to and including four aboveground stories in height, and limited to buildings that are 60 ft (18 m) or less in height above grade plane, which is consistent with limits established by model building codes for buildings of Type V construction. The height of a building above grade plane is determined by model building codes, which base the height on the average height of the highest roof surface above grade plane. For further information on the building height story limits, see model building codes.

It is the intent of this standard that if NFPA 13R is appropriate for use, it be used throughout the entire building. It is recognized that an accessory or incidental occupancy might exist within that residential occupancy (See 2012 NFPA 5000 Sections 6.2.1.3 & 6.2.1.5, or 2012 IBC Sections 508.2 & 509).

Such accessory or incidental occupancies 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 and similar provisions in many local building and fire model building codes. Use of NFPA 13R throughout the entire building in this case is allowed. Examples of accessory occupancies found in NFPA 13R installations can include parking garages/areas, community laundry rooms, clubhouses, exercise facilities, tenant storage, and so forth.

Where residential buildings are greater than four stories in height above grade plane, or where buildings are of mixed use where residential is not the predominant occupancy, NFPA 13R installations can include parking garages/areas, community laundry rooms, clubhouses, exercise facilities, tenant storage, and so forth.
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, Buildings over 60' in height above grade plane are not under the scope of NFPA 13R.

Where mixed occupancies buildings are no more than 4 stories in height, are not exceeding 60' in height above grade plane, and the residential occupancies are separated from the other occupancies in accordance with the separated occupancy provisions under the applicable local code/model building code (See 2012 NFPA 5000 Sections 6.2.4 & 7.4.1.2.2, or 2012 IBC Section 508.4), NFPA 13R can be used in the residential portion, while NFPA 13 is used in the other occupancies in the building.

Examples of accessory occupancies found in NFPA 13R installations can include parking garages/areas, community laundry rooms, clubhouses, exercise facilities, tenant storage, and so forth.

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 expected to prevent flashover within the compartment of origin where sprinklers are installed in the compartment. A sprinkler system designed and installed according to this standard cannot, however, be expected to completely control a fire involving fuel loads that are significantly higher than average for dwelling units [10 lb/ft² (49 kg/m²)], configurations of fuels other than those with typical residential occupancies, or conditions where the interior finish has an unusually high flame spread index (greater than 225).

To be effective, sprinkler systems installed in accordance with this standard need to open the sprinklers closest to the fire before the fire exceeds the ability of the sprinkler discharge to extinguish or control the fire. Conditions that allow the fire to grow beyond that point before sprinkler activation or that interfere with the quality of water distribution can produce conditions beyond the capabilities of the sprinkler system described in this standard. Unusually high ceilings or ceiling configurations that tend to divert the rising hot gases from sprinkler locations or change the sprinkler discharge pattern from its standard pattern can produce fire conditions that cannot be extinguished or controlled by the systems described in this standard.

NFPA 13R references NFPA 13 in many aspects (hanging and bracing, design densities and spacing outside of dwelling unit, painting and finish of sprinklers, welding, etc.). If this standard does not specifically address a situation, NFPA 13 is a good resource that can be utilized by the installer and the authority having jurisdiction for a solution. It is not the intent of this standard to require compliance with NFPA 13 when NFPA 13R is silent on a subject. Only AHJ approval should be
Statement of Problem and Substantiation for Public Input

The revisions to this appendix note are clarifications to the application of NFPA 13R when used in mixed occupancy buildings and structures under the Model Building Codes. It provides the appropriate code references in the Model Building Codes and explanations to help the code user apply with the sprinkler design requirements for residential occupancies in mixed occupancy buildings.

Submitter Information Verification
Submitter Full Name: Marshall Klein  
Affiliation: National Multi-Housing Council (NMHC)  
Submittal Date: Wed Jan 16 11:08:30 EST 2013

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Public Input No. 72-NFPA 13R-2013 [ Section No. A.1.1 ]

A.1.1

NFPA 13R is appropriate for use as an option to NFPA 13 only in those residential occupancies, as defined in this standard, up to and including four aboveground stories in height, and limited to buildings that are 60 ft (18 m) or less in height above grade plane, which is consistent with limits established by model building codes for buildings of Type V construction. This standard does not define how to measure the number of stories. This is a function of the model building codes. The height of a building above grade plane is determined by model building codes, which base the height on the average height of the highest roof surface above grade plane. For further information on the building height story limits, see model building codes.

It is the intent of this standard that if NFPA 13R is appropriate for use, it be used throughout the entire building. It is recognized that an accessory or incidental occupancy to the operations of the residential occupancy might exist within that residential occupancy.

Such accessory or 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 and similar provisions in many local building and fire codes. Use of NFPA 13R throughout the entire building in this case is allowed. Examples of accessory occupancies found in NFPA 13R installations can include parking garages/areas, community laundry rooms, clubhouses, exercise facilities, tenant storage, and so forth.

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. The entire building shall be protected throughout with a
sprinkler system installed 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. Examples of accessory occupancies found in NFPA 13R installations can include parking garages/areas, community laundry rooms, clubhouses, exercise facilities, tenant storage, and so forth.

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 expected to prevent flashover within the compartment of origin where sprinklers are installed in the compartment. A sprinkler system designed and installed according to this standard cannot, however, be expected to completely control a fire involving fuel loads that are significantly higher than average for dwelling units [10 lb/ft$^2$ (49 kg/m$^2$)], configurations of fuels other than those with typical residential occupancies, or conditions where the interior finish has an unusually high flame spread index (greater than 225).

To be effective, sprinkler systems installed in accordance with this standard need to open the sprinklers closest to the fire before the fire exceeds the ability of the sprinkler discharge to extinguish or control the fire. Conditions that allow the fire to grow beyond that point before sprinkler activation or that interfere with the quality of water distribution can produce conditions beyond the capabilities of the sprinkler system described in this standard. Unusually high ceilings or ceiling configurations that tend to divert the rising hot gases from sprinkler locations or change the sprinkler discharge pattern from its standard pattern can produce fire conditions that cannot be extinguished or controlled by the systems described in this standard.

NFPA 13R references NFPA 13 in many aspects (hanging and bracing, design densities and spacing outside of dwelling unit, painting and finish of sprinklers, welding, etc.). If this standard does not specifically address a situation, NFPA 13 is a good resource that can be utilized by the installer and the authority having jurisdiction for a solution. It is not the intent of this standard to require compliance with NFPA 13 when NFPA 13R is silent on a subject. Only AHJ approval should be required.

**Figure A.1.1(a) Bedroom.**
Figure A.1.1(b) Manufactured Home Bedroom.

Figure A.1.1(c) Living Room.

Statement of Problem and Substantiation for Public Input

Reworded to note that number of stories is determined by building codes. Moved the examples of accessory occupancies to the proper paragraph.

Submitter Information Verification

Submitter Full Name: Peter Schwab  
Organization: Wayne Automatic Fire Sprinkler  
Submittal Date: Thu May 30 13:45:46 EDT 2013

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Public Input No. 37-NFPA 13R-2012 [ New Section after A.1.2 ]

Update Table A.1.2 with more currently available fire loss data

Statement of Problem and Substantiation for Public Input

This table needs to be updated. I thought this was supposed to happen last cycle.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 17:05:50 EST 2012

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Public Input No. 38-NFPA 13R-2012 [ New Section after A.5.2.3 ]

A.5.2.3.1

All nonmetallic pipe and fitting materials can be damaged by contact with chemicals found in some construction products, such as thread sealants, leak detectors, firestops, insulation, spray foams, cutting oils, termiticides, insecticides, antifreeze, coupling lubes, communication cables, wires, flux, solder, mastic, PVC coated floor clamps, pipe tapes, grease and cooking oils, rubber and plasticizers, antimicrobial coatings, and so forth. The chemical compatibility of such products with the particular pipe or fitting material must be
verified prior to use. Otherwise, contact between the construction product and the pipe or fitting must be avoided.

Statement of Problem and Substantiation for Public Input

This language was removed by the TIA on compatibility. This is good guidance language that should remain in the standard.

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Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 17:07:23 EST 2012

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A.5.4.2

Piping covered by insulation, as shown in Figure A.5.4.2(a) through Figure A.5.4.2(e), is considered part of the area below the ceiling and not part of the unheated attic area.

Figure A.5.4.2(a) Insulation Recommendations — Arrangement 1.

Figure A.5.4.2(b) Insulation Recommendations — Arrangement 2.

Figure A.5.4.2(c) Insulation Recommendations — Arrangement 3.

Figure A.5.4.2(d) Insulation Recommendations — Arrangement 4.
Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

This annex addition is a common method of insulation tenting.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Fri Mar 29 10:18:13 EDT 2013

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FIGURE A.5.4.2 (f) Insulation Recommendations - Arrangement 6
Public Input No. 48-NFPA 13R-2013 [ Section No. A.5.4.2(1) ]

A.5.4.2(1)

The use of antifreeze solutions in all new sprinkler systems should be restricted to listed antifreeze solutions only.

See uploaded file.

Additional Proposed Changes

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Statement of Problem and Substantiation for Public Input

Note: This Proposal originates from Tentative Interim Amendment 13R-13-2 (TIA 1065) issued by the Standards Council on August 9, 2012.

The information provided in the Fire Protection Research Foundation report “Antifreeze Solutions Supplied through Spray Sprinklers: Interim Report” illustrates that under certain conditions (pressure, fire size, k-factor, ceiling height, deflector design...etc) a 50% glycerine solution is capable of igniting and causing a dramatic increase in heat release rate. As noted in the FPRF report, these results highlight the "complicated interaction between sprinkler spray and the ignition source." As a result of this additional testing, there are more questions that need to be answered, and the testing shows that concentrations of anti-freeze that previous testing indicated were acceptable and would not support combustion actually do with a stronger ignition source. In addition, sprinklers with larger orifices that require lower pressure than typical residential sprinklers and potentially a lager droplet distribution also ignited. It is clear that further testing is need to fully understand under what conditions an anti-freeze solutions are safe, anti-freeze solutions can not be allowed in sprinkler systems.

Emergency Nature: The latest testing shows that anti-freeze concentrations currently allowed in sprinkler systems will support combustion and increase the size of the fire. This is a safety issue that requires changes in the standard.

Submitter Information Verification

Submitter Full Name: Terry Victor
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Submittal Date: Fri Jan 25 11:13:34 EST 2013
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A.6.2.3.3

Care should be taken in positioning sprinklers in bathrooms near exhaust fan units. Some exhaust fan units have heaters built in to warm up the bathroom, and these units have the potential to activate sprinklers. Combination exhaust fan and heater units should be treated as wall-mounted diffusers for the purposes of using Table 6.2.3.3.3. Another area that should be avoided is directly in front of a vanity sink in a bathroom or dressing area with a low ceiling and over a kitchen sink. The use of hair dryers in vanity and bathroom areas can accidentally direct hot temperatures towards the sprinklers when installed above. In kitchens, sometimes steaming hot water is dumped into the sink which could affect a sprinkler installed directly overhead.

Statement of Problem and Substantiation for Public Input

There have been reported cases of sprinkler activation due to hair dryers. These are good practices and are best located in the annex as guidance.

Submitter Information Verification

Submitter Full Name: Peter Schwab  
Organization: Wayne Automatic Fire Sprinkler  
Submittal Date: Tue Dec 11 17:10:57 EST 2012

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**A.6.4.6.3.1**

Modern multiple-family building floor plans incorporate certain architectural characteristics or features that can initially seem to make absolute coverage of every single square foot of floor area a challenge. These features include angled walls, wing walls, slightly indented walls, and various soffit configurations.

The “problem” arises when one erroneously considers water discharging from a residential sprinkler to travel only in an absolute straight line, as if it were beams of light. When this approach is taken, small [1 ft² to 3 ft² (0.09 m² to 0.28 m²)] typically triangular “shadowed areas” can in theory be formed on the floor adjacent to their referenced architectural features. The shadowed areas are purely on paper and do not take into account the dynamic variables affecting sprinkler discharge and distribution. It is hardly conceivable that anything located within one of these areas could remain dry during adjacent sprinkler discharge. The committee recognizes that such small theoretically shadowed floor areas are not an issue. Residential sprinkler distribution patterns are specifically intended to provide superior wall-wetting capability. Survivability of the occupants is more dependent on such wall-wetting than on absolute floor coverage.

Though not specifically referenced as such, in fact, NFPA 13 already permits an appreciable amount of “shadowing” by way of the basic obstruction figures and tables for various sprinkler applications. Take, for example, Figure 8.10.6.2.1.3 of NFPA 13, Minimum Distance from Obstruction (residential upright and pendent spray sprinklers). Consider a residential sprinkler spaced 10 ft (3.05 m) off of wall. A 12 in. (305 mm) round column located in the direction of the wall and 4 ft (1.22 m) away from the sprinkler would create an allowable “shadowed” area of approximately 8.6 ft² (0.8 m²), using the line-of-sight approach.

The intent of NFPA 13R is to provide economically viable, flashover-preventing, survivability enhancing residential sprinkler layouts. It is not the intent of NFPA 13R to require additional sprinklers for these 1 ft² to 3 ft² (0.09 m² to 0.28 m²) areas.

**Statement of Problem and Substantiation for Public Input**

This last paragraph seems to be one that should have been deleted. It is referring to 1 ft² to 3 ft² areas. The 3 ft² area limitation is a holdover from the 2010 edition.

**Submitter Information Verification**

Submitter Full Name: Peter Schwab  
Organization: Wayne Automatic Fire Sprinkler  
Submittal Date: Tue Dec 11 17:12:28 EST 2012

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A.6.4.6.3.3.1

See Figure A.6.4.6.3.3.1(a) and Figure A.6.4.6.3.3.1(b).

The obstruction shown in Figure A.6.4.6.3.3.1(a) is a vertical obstruction in a room similar to a column. Sprinkler response and water distribution tests have been conducted on such obstructions and the data shows that the size of the obstruction as well as the size of the compartment are critical variables to sprinkler response. A larger shadow area can be acceptable in a smaller compartment. The obstruction shown in Figure A.6.4.6.3.3.1(b) is a bump out of a wall. Sprinkler response and water distribution tests have shown that this type of obstruction is not a problem.

Figure A.6.4.6.3.3.1(a) Example of Shadow Areas (SSU/SSP).

Figure A.6.4.6.3.3.1(b) Example of Shadow Areas (HSU).
Statement of Problem and Substantiation for Public Input

The sprinkler response and water distribution tests mentioned here have been given to the committee with the same proposal on NFPA 13D. We have chosen not to attach the same files to this proposal to save paperwork. The issue trying to be addressed here is a greater awareness of shadow area concerns.

Submitter Information Verification

Submitter Full Name: Roland Asp
Organization: National Fire Sprinkler Association
Affiliation: NFSA E&S Committee
Submittal Date: Fri May 24 15:22:45 EDT 2013

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Public Input No. 41-NFPA 13R-2012 [Section No. A.6.9]

A.6.9
These connections should be installed so that the valve can be opened fully and for a sufficient time period to ensure a proper test, ensure proper drainage, without causing water damage. The test connection should be designed and sized to verify the sufficiency of the water supply and alarm mechanisms.

Statement of Problem and Substantiation for Public Input

This is the section for the main drain. Remove the language referring to a test connection. That is found in A.6.10.

Submitter Information Verification

Submitter Full Name: Peter Schwab
Organization: Wayne Automatic Fire Sprinkler
Submittal Date: Tue Dec 11 17:13:26 EST 2012

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/TerraView/Content/13R-2013.ditamap/2/C1355264006149.xml
A.6.17

The full flow test of the backflow prevention valve can be performed with a test header or other connection downstream of the valve. A bypass around the check valve in the fire department connector line with a control valve in the normally closed position can be an acceptable arrangement. When flow to a visible drain cannot be accomplished, closed loop flow can be acceptable if a flowmeter or site glass is incorporated into the system to ensure flow.

Statement of Problem and Substantiation for Public Input

This is a companion to our public input to create a means for testing the backflow device. This annex note is helpful material for methods that can be used to test the backflow preventer.

Related Public Inputs for This Document

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Submitter Information Verification

**Submitter Full Name:** Roland Asp  
**Organization:** National Fire Sprinkler Association  
**Affiliation:** NFSA E&S Committee  
**Submittal Date:** Fri May 24 14:56:49 EDT 2013

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