

***Technical Committee on  
Hanging and Bracing of Water-Based  
Fire Protection Systems***

**MEMORANDUM**

**DATE:** January 17, 2010

**TO:** Principal and Alternate Members of the Technical Committee on Hanging and Bracing of Water Based Fire Protection Systems

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

**SUBJECT:** **AUT-HBS AGENDA PACKAGE – A2012 ROP Meeting**

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Enclosed is the agenda for the Report on Proposals (ROP) meeting for NFPA 13, *Standard for the Installation of Sprinkler Systems*. NFPA 13 has entered the Annual 2012 revision cycle and will produce a 2013 Edition. It is imperative that you review the attached proposals in advance, with your ideas and substantiations for your views. Please note the previous actions and committee statements will appear with the attached proposals. 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 Joanne Goyette at (617) 984-7950. 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 [JGoyette@nfpa.org](mailto:JGoyette@nfpa.org) or [MKlaus@nfpa.org](mailto:MKlaus@nfpa.org). We look forward to meeting everyone in Savannah, GA at The Savannah Riverfront Marriott.

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## **PART 1 – MEETING AGENDA**

**REPORT ON PROPOSALS (ROP) MEETING**  
*NFPA Technical Committee on*  
*Hanging and Bracing of Water-Based*  
*Fire Protection Systems*

Savannah Riverfront Marriott  
Savannah, GA  
February 2-3, 2011

**AGENDA**

1. Call to Order at **8:00 AM**.
2. Self-Introductions of members and guests
3. Review of Distributed Meeting Materials
4. Approval of A09-ROC Meeting Minutes
5. Review of Meeting Procedures and Revision Process
6. Overview of Workload/Schedule/Agenda Additions
7. Address Public and Committee Proposals
8. Assignments for ROC Meeting
9. New Business
10. Next Meeting
11. Adjournment

## **PART 2 - TC ADDRESS LIST**

# Address List No Phone

1/19/2011  
Matthew J. Klaus  
AUT-HBS

## Hanging and Bracing of Water-Based Fire Protection Systems

### Automatic Sprinkler Systems

<b>Richard W. Bonds</b> <b>Principal</b> Ductile Iron Pipe Research Association 245 Riverchase Pkwy East, Suite O Birmingham, AL 35244	<b>M</b> 10/10/1997 <b>AUT-HBS</b>	<b>Antonio C. M. Braga</b> <b>Principal</b> FM Global 6320 Canoga Avenue, Suite 1100 Woodland Hills, CA 91367 <b>Alternate: Christopher I. Deneff</b>	<b>I</b> 10/10/1997 <b>AUT-HBS</b>
<b>Samuel S. Dannaway</b> <b>Principal</b> S. S. Dannaway Associates, Inc. 720 Iwilei Road, Suite 412 Honolulu, HI 96817-5316	<b>SE</b> 4/17/1998 <b>AUT-HBS</b>	<b>John Deutsch</b> <b>Principal</b> City of Brea Fire Department 1 Civic Center Drive Brea, CA 92821	<b>E</b> 7/26/2007 <b>AUT-HBS</b>
<b>Daniel C. Duggan</b> <b>Principal</b> Fire Sprinkler Design 1318 Colony Way Court Chesterfield, MO 63017	<b>M</b> 10/23/2003 <b>AUT-HBS</b>	<b>Thomas J. Forsythe</b> <b>Principal</b> Hughes Associates, Inc. 2551 San Ramon Valley Blvd., Suite 209 San Ramon, CA 94583 <b>Alternate: Michael J. Madden</b>	<b>SE</b> 1/16/1998 <b>AUT-HBS</b>
<b>John D. Gillengerten</b> <b>Principal</b> State of California Office of Health Planning & Development 1600 9th Street, Room 420 Sacramento, CA 95814 <b>Building Seismic Safety Council/Code Resource Support Committee</b>	<b>E</b> 7/14/2004 <b>AUT-HBS</b>	<b>Jeffrey E. Harper</b> <b>Principal</b> The RJA Group, Inc. Rolf Jensen & Associates, Inc. 600 West Fulton Street, 5th Floor Chicago, IL 60661 <b>Alternate: Matthew W. Donahue</b>	<b>SE</b> 11/2/2006 <b>AUT-HBS</b>
<b>Kraig Kirschner</b> <b>Principal</b> AFCON 9600 Klingerman Street PO Box 3365 El Monte, CA 91733	<b>M</b> 10/10/1997 <b>AUT-HBS</b>	<b>Alan R. Laguna</b> <b>Principal</b> Merit Sprinkler Company, Inc. 930 Kenner Avenue PO Box 1447 Kenner, LA 70062-1447	<b>IM</b> 10/3/2002 <b>AUT-HBS</b>
<b>George E. Laverick</b> <b>Principal</b> Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 <b>Alternate: Emil W. Misichko</b>	<b>RT</b> 4/15/2004 <b>AUT-HBS</b>	<b>Norman J. MacDonald, III</b> <b>Principal</b> FlexHead Industries, Inc. 56 Lowland Street Holliston, MA 01746 <b>Alternate: Robert E. Bachman</b>	<b>M</b> 7/29/2005 <b>AUT-HBS</b>
<b>Wayne M. Martin</b> <b>Principal</b> Wayne Martin & Associates Inc. 388 Highland Drive Oxnard, CA 93035	<b>SE</b> 10/10/1997 <b>AUT-HBS</b>	<b>David S. Mowrer</b> <b>Principal</b> Babcock & Wilcox Technical Services, LLC Y-12 National Security Complex PO Box 2009, MS-8107 Oak Ridge, TN 37831-8107 <b>Alternate: J. Scott Mitchell</b>	<b>U</b> 10/10/1997 <b>AUT-HBS</b>

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Matthew J. Klaus  
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## Hanging and Bracing of Water-Based Fire Protection Systems

### Automatic Sprinkler Systems

<b>Randy R. Nelson</b> <b>Principal</b> VFS Fire and Security Services 1011 East Lacy Avenue Anaheim, CA 92805 <b>American Fire Sprinkler Association</b> Installer/Maintainer <b>Alternate: Charles W. Bamford</b>	<b>IM</b> 10/10/1997 <b>AUT-HBS</b>	<b>Marco R. Nieraeth</b> <b>Principal</b> XL Global Asset Protection Services 5641 Pepperwood Avenue Lakewood, CA 90712 <b>Alternate: Todd A. Dillon</b>	<b>I</b> 3/2/2010 <b>AUT-HBS</b>
<b>Janak B. Patel</b> <b>Principal</b> Savannah River Nuclear Solutions 3704 Clark Crossing Martinez, GA 30907	<b>U</b> 10/10/1997 <b>AUT-HBS</b>	<b>Michael A. Rothmier</b> <b>Principal</b> UA Joint Apprenticeship Committee Local 669 9501 Elmhurst Lane "A" Highlands Ranch, CO 80129 <b>United Assn. of Journeymen &amp; Apprentices of the Plumbing &amp; Pipe Fitting Industry</b> <b>Alternate: Charles W. Ketner</b>	<b>L</b> 4/17/1998 <b>AUT-HBS</b>
<b>Peter T. Schwab</b> <b>Principal</b> Wayne Automatic Fire Sprinklers, Inc. 222 Capitol Court Ocoee, FL 34761-3033	<b>IM</b> 3/15/2007 <b>AUT-HBS</b>	<b>Zeljko Sucevic</b> <b>Principal</b> Vipond Fire Protection 6380 Vipond Drive Mississauga, ON L5T 1A1 Canada <b>Canadian Automatic Sprinkler Association</b>	<b>IM</b> 11/2/2006 <b>AUT-HBS</b>
<b>James Tauby</b> <b>Principal</b> Mason Industries, Inc. 350 Rabro Drive Hauppauge, NY 11788	<b>M</b> 10/10/1997 <b>AUT-HBS</b>	<b>Jack W. Thacker</b> <b>Principal</b> Allan Automatic Sprinkler Corp. of So. California 3233 Enterprise Street Brea, CA 92821 <b>National Fire Sprinkler Association</b> Contractor <b>Alternate: Ronald N. Webb</b>	<b>IM</b> 10/10/1997 <b>AUT-HBS</b>
<b>Glenn E. Thompson</b> <b>Principal</b> Liberty Mutual Property 2959 Bighorn Drive Corona, CA 92881-8770 <b>Property Casualty Insurers Association of America</b> <b>Alternate: Donald L. Dutra</b>	<b>I</b> 10/27/2005 <b>AUT-HBS</b>	<b>Victoria B. Valentine</b> <b>Principal</b> National Fire Sprinkler Association, Inc. 40 Jon Barrett Road Patterson, NY 12563 <b>National Fire Sprinkler Association</b> Design Technician <b>Alternate: Sheldon Dacus</b>	<b>M</b> 4/3/2003 <b>AUT-HBS</b>

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## Hanging and Bracing of Water-Based Fire Protection Systems

### Automatic Sprinkler Systems

<b>Thomas G. Wellen</b> <b>Principal</b> American Fire Sprinkler Association, Inc. 12750 Merit Drive, Suite 350 Dallas, TX 75251 <b>American Fire Sprinkler Association</b> Design Technician <b>Alternate: Kenneth W. Wagoner</b>	<b>IM 7/28/2006</b> <b>AUT-HBS</b>	<b>George Von Gnatensky</b> <b>Voting Alternate</b> Tolco 1375 Sampson Avenue Corona, CA 92879-1748 <b>National Fire Sprinkler Association</b> Manufacturer <b>Voting Alt. to NFSA Rep. (Mfr)</b>	<b>M 10/10/1997</b> <b>AUT-HBS</b>
<b>Robert E. Bachman</b> <b>Alternate</b> Robert E. Bachman, Consulting Structural Engineer 25152 La Estrada Drive Laguna Niguel, CA 92677 <b>FlexHead Industries, Inc.</b> <b>Principal: Norman J. MacDonald, III</b>	<b>M 11/2/2006</b> <b>AUT-HBS</b>	<b>Charles W. Bamford</b> <b>Alternate</b> Bamford Inc. 9615 NE 201st Street Bothell, WA 98011 <b>American Fire Sprinkler Association</b> Installer/Maintainer <b>Principal: Randy R. Nelson</b>	<b>IM 1/18/2001</b> <b>AUT-HBS</b>
<b>Sheldon Dacus</b> <b>Alternate</b> Security Fire Protection Company 4495 Mendenhall Road Memphis, TN 38141 <b>National Fire Sprinkler Association</b> Design Technician <b>Principal: Victoria B. Valentine</b>	<b>M 10/10/1997</b> <b>AUT-HBS</b>	<b>Christopher I. Deneff</b> <b>Alternate</b> FM Global 1301 Atwood Avenue PO Box 7500 Johnston, RI 02919 <b>Principal: Antonio C. M. Braga</b>	<b>I 9/30/2004</b> <b>AUT-HBS</b>
<b>Todd A. Dillon</b> <b>Alternate</b> XL Global Asset Protection Services 1620 Winton Avenue Lakewood, OH 44107 <b>Principal: Marco R. Nieraeth</b>	<b>I 10/23/2003</b> <b>AUT-HBS</b>	<b>Matthew W. Donahue</b> <b>Alternate</b> The RJA Group, Inc. Rolf Jensen & Associates, Inc. 2125 Oak Grove Road, Suite 300 Walnut Creek, CA 94598 <b>Principal: Jeffrey E. Harper</b>	<b>SE 3/4/2008</b> <b>AUT-HBS</b>
<b>Donald L. Dutra</b> <b>Alternate</b> Liberty Mutual Insurance 470 Cola Ballena, Unit A Alameda, CA 94501-3676 <b>Property Casualty Insurers Association of America</b> <b>Principal: Glenn E. Thompson</b>	<b>I 10/28/2008</b> <b>AUT-HBS</b>	<b>Charles W. Ketner</b> <b>Alternate</b> National Automatic Sprinkler Fitters LU 669 Joint Apprenticeship & Training Committee 7050 Oakland Mills Road Columbia, MD 20732 <b>United Assn. of Journeymen &amp; Apprentices of the Plumbing &amp; Pipe Fitting Industry</b> <b>Principal: Michael A. Rothmier</b>	<b>L 1/10/2008</b> <b>AUT-HBS</b>

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Matthew J. Klaus  
AUT-HBS

## Hanging and Bracing of Water-Based Fire Protection Systems Automatic Sprinkler Systems

<b>Michael J. Madden</b>	<b>SE 4/17/2002</b>	<b>Emil W. Misichko</b>	<b>RT 10/10/1997</b>
<b>Alternate</b> Hughes Associates, Inc. 6 Centerpointe Drive, Suite 760 La Palma, CA 90623 <b>Principal: Thomas J. Forsythe</b>	<b>AUT-HBS</b>	<b>Alternate</b> Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 <b>Principal: George E. Laverick</b>	<b>AUT-HBS</b>
<b>J. Scott Mitchell</b>	<b>U 7/12/2001</b>	<b>Kenneth W. Wagoner</b>	<b>IM 10/4/2007</b>
<b>Alternate</b> B & W Technical Services Pantex PO Box 1241 Panhandle, TX 79068 <b>Principal: David S. Mowrer</b>	<b>AUT-HBS</b>	<b>Alternate</b> Parsley Consulting Engineers 350 West 9th Avenue, Suite 206 Escondido, CA 92025-5053 <b>American Fire Sprinkler Association</b> Design Technician <b>Principal: Thomas G. Wellen</b>	<b>AUT-HBS</b>
<b>Ronald N. Webb</b>	<b>IM 1/14/2005</b>	<b>Matthew J. Klaus</b>	<b>12/16/2010</b>
<b>Alternate</b> S.A. Comunale Company, Inc. 2900 Newpark Drive Barberton, OH 44203 <b>National Fire Sprinkler Association</b> Contractor <b>Principal: Jack W. Thacker</b>	<b>AUT-HBS</b>	<b>Staff Liaison</b> National Fire Protection Association 1 Batterymarch Park Quincy, MA 02169-7471	<b>AUT-HBS</b>

## **PART 3 – NFPA STAFF LIAISON NOTICE**

## **Note from the Staff Liaison**

Dear Committee Members:

We are very pleased that you will be participating in the processing of the 2013 Edition of NFPA 13. Development of the Standard would not be possible without the participation of volunteers like you.

## **Materials You Will Need to Have for the Committee Meeting**

- Agenda with all attachments
- Committee Officers' Guide (Chairs)
- Roberts' Rules of Order (Chairs – abbreviated version may be found in the Committee Officer's Guide)

## **"Nice to Have" Materials**

- NFPA Annual Directory
- NFPA Manual of Style
- Prepared Committee Proposals (If applicable)

## **Preparation**

Prepared actions and statements will clarify your position and provide the committee with a starting point. Prepared actions and statements really help expedite the progress of the meeting.

## **Getting Things Done**

### ***Proposals***

Only one posting of proposals will be made; it will be arranged in section/order and will be pre-numbered. This will be posted to the NFPA e-committee website and also attached to this Agenda Package. If you have trouble accessing the website please contact Joanne Goyette at [jgoyette@nfpa.org](mailto:jgoyette@nfpa.org). Please bring the proposals to the committee meeting.

The processing schedule to be followed by the committee is outlined in the schedule in this package. As the schedule is very tight, no extensions of the deadline for receipt of completed ballots or extensions of the period to change vote will be possible.

It is therefore suggested that those of you who must consult with others regarding your ballot do so based on the material passed out at the meeting, and your meeting notes. Do not wait for receipt of the ballot materials from NFPA.

### ***Regulations and Operating Procedures***

All actions at, and following, the committee meetings will be governed in accordance with the NFPA Regulations Governing Committee Projects. The latest Regulations (as of this printing) appear on pages 10-28 of the 2010 NFPA Directory.

All committee actions will be in accordance with the NFPA Regulations Governing Committee Projects. The style of NFPA 13 will comply with the Manual of Style for NFPA Technical Committee Documents. Failure to comply with these rules could result in challenges to the standards-making process. A successful challenge on procedural grounds

could prevent or delay publication of NFPA 13. Consequently, committees must follow the regulations and procedures.

## **Processing Proposals**

### ***Proposals Requiring Committee Actions***

All public proposals must be acted upon. If a proposal does not comply with Section 4.3.3 of the NFPA Regulations Governing Committee Projects (an incomplete proposal), the committee may reject the proposal. However, any of the standard actions may be taken. Please make sure that the committee's action and the committee's statement result in a complete action that can be readily understood.

## **Committee Actions**

The following are the actions permitted by the Regulations Governing Committee Projects for disposition of proposals.

### ***Accept***

The committee accepts the proposal exactly as written. Only editorial changes such as paragraph and section numbering, and corrections to spelling, capitalization, and hyphenation may be made.

If a proposal is accepted without a change of any kind, except for editorial changes, the committee can simply indicate acceptance. The committee should add a committee statement explaining the action if, for example the committee does not agree with all of the substantiation or supporting data or has a number of different reasons for acceptance than those stated in the substantiation or supporting data. The absence of such a statement could mislead the reader by giving the impression that the committee agreed with all of the substantiation for the proposal.

### ***Reject***

The proposal is rejected by the committee. If the principle or intent of the proposal is acceptable in whole or in part, the proposal should not be rejected, it should be accepted in principle or accepted in principle in part. A complete reason for rejection of the proposal must be supplied in the committee statement.

### ***Accept in Principle***

Accept the proposal with a change in wording. The committee action must indicate specifically what action was taken to revise the proposed wording, and where the wording being revised is located (i.e., in the proposed wording or in the document). If the details are in the action on another proposal, the committee action may simply indicate "Accept in Principle" but reference should then be made in the committee statement to the specific proposal detailing the action.

### ***Accept in Part***

If part of a proposal is accepted without change and the remainder is rejected, the proposal should be "Accepted in Part." The committee action must indicate what part was accepted and what part was rejected and the committee statement must indicate its reasons for rejecting that portion.

## ***Accept in Principle in Part***

This is a combination of "Accept in Principle" and "Accept in Part" as shown above.

## **Committee Statements**

Any proposal that is "Accepted in Principle", "Accepted in Part", "Accepted in Principle in Part" or "Rejected" must include a committee statement, preferably technical in nature that provides the reasons for the action.

References to the requirements of other documents as a reason for rejection should be to the specific sections of the document including the requirements. If there is more than one such section, the reference should include a least one, identified as an example.

It is a violation of the regulations for a committee to reject a proposal simply because it accepted a different proposal on the same subject. Reference in the committee statement to another committee action is inappropriate unless the referenced proposal contains all of the applicable technical justification for the action.

If the rejection or change was for the same reason that another proposal was rejected or changed, the committee statement may refer to that proposal giving the same reason for rejection or change. Please verify that cross references to other proposals are correct.

The committee statement should not refer to another committee statement which, in turn, refers to some other committee statement. There may be a situation where the committee will want to refer to two, three, or more committee statements if they are all appropriate.

When the committee develops a committee action for a proposal that is accepted in principle, the rationale must indicate why the wording submitted was not accepted. This reason should be technical in nature, unless the committee has simply rewritten the submitter's text, in which case the committee can state that the proposed wording should meet the submitter's intent.

The committee statement on a proposal that is accepted in part should indicate specifically why that part of the proposal was not accepted.

## **Easy Procedures for Handling a Motion**

NFPA Committee Meetings are conducted in accordance with Roberts' Rules of Order. In order for a proposal to be discussed, a motion must be made. A simplified procedure for discussion of motions is as follows:

### ***Member***

- Member Addresses the Chair
- Receives Recognition from the Chair
- Introduces the Motion
- (Another Member) Seconds the Motion.

### ***Chair (Presiding Officer)***

- States the Motion
- Calls for Discussion

- Takes the vote
- Announces the Result of the Vote

It is imperative that you review the proposals before the meeting and develop proposed actions and statements. These prepared actions and statements will clarify your position and provide the committee with a starting point. Prepared actions and statements really help expedite the progress of the meeting.

## **Balloting Dos and Don'ts**

Either fax or mail your ballot - Please do not do both. Don't return the entire package; just return the appropriate ballot page(s) and explanation of votes.

## **Alternate Members**

At the end of each code cycle, the Standards Council reviews records of all members regarding their participation in the standards-making process. Therefore, it is important for alternate members to remember that return of ballots is expected, even though they know that their principal member will be attending meetings and returning their ballots.

## **General Procedures for Meetings**

- Use of tape recorders or other means capable of producing verbatim transcriptions of any NFPA Committee Meeting is not permitted.
- Attendance at all NFPA Committee Meetings is open.
- All guests must sign in and identify their affiliation.
- Participation in NFPA Committee Meetings is generally limited to committee members and NFPA staff. Participation by guests is limited to individuals, who have previously requested of the chair time to address the committee on a particular item, or individuals who wish to speak regarding public proposals or comments that they submitted.
- The chairman reserves the right to limit the amount of time available for any presentation.
- No interviews will be allowed in the meeting room at any time, including breaks.
- All attendees are reminded that formal votes of committee members will be secured by letter ballot. Voting at this meeting is used to establish a sense of agreement, but only the results of the formal letter ballot will determine the official position of the committee on any proposal.
- Note to Special Experts: Particular attention is called to Section 3.3(e) of the NFPA Guide for the Conduct of Participants in the NFPA Codes and Standards Development Process in the NFPA Directory that directs committee members to declare their interest representation if it is other than their official designation as shown on the committee roster, such as when a special expert is retained and represents another interest category on a particular subject. If such a situation exists on a specific issue or issues, the committee member shall declare those interests to the committee, and refrain from voting on any proposal, comment, or other matter relating to those issues.
- Smoking is not permitted at NFPA Committee Meetings

## **PART 4 – A2009 ROC MEETING MINUTES**

***Draft Meeting Minutes***  
***Report on Comments Meeting***  
**NFPA Technical Committee on**  
**Hanging and Bracing of Water-Based**  
**Fire Protection Systems**

**Savannah Marriott**  
**Savannah, GA**  
**September 11-12, 2008**

- 1. Call to Order.** Meeting was called to order at 8:00 AM by Chair Tony Braga.
- 2. Self-Introductions of members and guests.** Committee members, Alternates and Guests introduced themselves and reviewed the roster for edits. Attached is a list of attendees.
- 3. Approval of A09-ROP Meeting Minutes.** The minutes of the A09 ROP meeting were approved with minor edits.
- 4. Review of Meeting Procedures and Revision Process.** Jim Lake provided a presentation on the meeting procedures for ROC meetings and the A09 Revision Process schedule.
- 5. Overview of Workload/Schedule/Agenda Additions.** Chair Braga provided an overview of the materials and workload for the meeting. During this time the Chair also reviewed the agenda of the upcoming meeting of the FPRF Automatic Sprinkler Research Council meeting that will be held on September 22.

The chair also led a discussion regarding issues in California as raised in a letter from committee member Jack Thacker. No specific action was taken.

- 6. Development of Report on Comments.** The committee developed a Report on Comments for Chapter 9 of NFPA 13. See the Committee Ballot and Report on Comments for the actions of the committee.

During this portion of the meeting the following Task Groups were formed to handle specific logs and issues.

**Task Group on ASCE 7 Letter**

Victoria Valentine  
John Deutch  
Tony Braga

This group was tasked with working with the Chair to develop a letter to ASCE-7 regarding the ceiling requirements in the standard. No final action was taken at the committee meeting and this will be done in the near future.

**Log 75 Task Group**

George Laverick  
Norm MacDonald  
Sam Dannaway

This group was tasked with developing a Committee Comment as a result of the committee actions on Log 75. This TG work resulted in CC#2 and the TG was dismissed.

**Annex F Task Group**

The Annex F Task Group, formed at the ROP meeting, presented their report. This TG work resulted in CCs#5 and 6. The TG was dismissed with thanks of the committee.

7. **New Business.** No new business was conducted.
8. **Next Meeting.** The next scheduled meeting of this committee will be for the A12 Revision Cycle and will occur in the first quarter of 2011.
9. **Adjournment.** The meeting adjourned at 2:00pm on September 12.

## **AUT-HBS ROC Meeting Attendance**

### **Principal Members**

Antonio Braga (Chair)	FM Global
Sam Dannaway	S.S. Danaway Associates
John Deutch	City of Brea, CA
Dan Duggan	Fire Sprinkler Design
Tom Forsythe	Hughes Associates
John Gillengerten	Building Seismic Safety Council
Kraig Kirschner	AFCON
George Laverick	UL
Norm MacDonald	FlexHead Industries
Dave Mowrer	HSB Global Standards
Randy Nelson	AFSA
Janek Patel	Bechtel Savannah River Co.
Mike Posey	NFSA
Mike Rothmier	UA
Peter Schwab	Wayne Automatic Fire Sprinklers
Zeljko Sucevic	CASA
James Tauby	Mason Industries
Victoria Valentine	NFSA
Tom Wellen	AFSA

### **Alternates**

Bob Bachman	FlexHead Industries
Charles Bamford	AFSA
Sheldon Dacus	NFSA
Chris Deneff	FM Global
Glenn Thompson	Liberty Mutual Property
George Von Gnatensky	NFSA
Ken Wagoner	AFSA
Ron Webb	NFSA

James Lake (Secretary)	NFPA
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### **Guests**

Dave Ash	Lubrizol
Doug Weitzig	Lubrizol
Pete MacDonald	FlexHead Industries
Russ Fleming	NFSA

## **PART 5 – A2012 REVISION CYCLE DATES**

# 2012 Annual Revision Cycle

	<b>PROCESS STAGE</b>	<b>PROCESS STEP</b>	<b>DATES FOR TC</b>	<b>DATES FOR TCC</b>
1	PRELIMINARY	1.0 Notification of intent to enter cycle	7/9/10	7/9/10
2	REPORT ON PROPOSALS (ROP)	2.1 Proposal closing date	11/23/10*	11/23/10*
		2.2 Final date for ROP meeting	2/25/11	2/24/11
		2.3 Final date for mailing TC ballots	3/18/11	2/18/11
		2.4 Receipt of (TC) ballots by staff liaison	4/22/11	3/11/11
		2.5 Receipt of TC recirculation ballots	5/6/11	3/18/11
		2.6 Final date for TCC meeting		4/15/11
		2.7 Final date for mailing TCC ballots		4/22/11
		2.8 Receipt of TCC ballots		5/13/11
		2.9 Receipt of TCC recirculation ballots		5/20/11
		2.10 Final copy (w/ ballot statements) to Secretary, Standards Council	5/13/11	5/27/11
		2.11 Completion of Reports	5/20/11	6/3/11
		2.12 ROP Published and Posted	6/24/11	6/24/11
3	REPORT ON COMMENTS (ROC)	3.1 Comment closing date	8/30/11	8/30/11
		3.2 Final date for ROC meeting	11/4/11	10/7/11
		3.3 Final date for mailing TC ballots	11/18/11	10/21/11
		3.4 Receipt of (TC) ballots by staff liaison	12/2/11	11/11/11
		3.5 Receipt of TC recirculation ballots	12/9/11	11/18/11
		3.6 Final date for TCC meeting		12/16/11
		3.7 Final date for mailing TCC ballots		12/23/11
		3.8 Receipt of TCC ballots		1/13/12
		3.9 Receipt of TCC recirculation ballots		1/20/12
		3.10 Final copy (w/ ballot statements) to Secretary, Standards Council	12/23/11	1/27/12
		3.11 Completion of Reports	1/13/12	2/3/12
		3.12 ROC Published and Posted	2/24/12	2/24/12
4	TECH SESSION PREPARATION & ISSUANCE OF CONSENT DOCUMENTS	4.1 Notice of Intent to Make a Motion (NITMAM) Closing Date	4/6/12	4/6/12
		4.2 Posting of Filed NITMAM	5/4/12	5/4/12
		4.3 Council Issuance Date for Consent Documents	5/29/12	5/29/12
		4.4 Appeal Closing Date for Consent Documents	6/13/12	6/13/12
5	TECHNICAL SESSION	5.0 Association Meeting for Documents with Certified Amending Motions	6/3-7/12	6/3-7/12
6	APPEALS & ISSUANCE OF DOCUMENTS W/CAMS	6.1 Appeal closing date for Documents with Certified Amending Motions	6/27/12	6/27/12
		6.2 Council issuance for Documents with Certified Amending Motions	7/26/12	7/26/12

\* Proposal Closing Dates may vary according to documents and schedules for Revision Cycles may change. Please check the NFPA website ([www.nfpa.org](http://www.nfpa.org)) for the most up-to-date information on proposals closing dates and schedules.

**PART 6 – NFPA 13 ANNUAL 2012 MASTER  
SCHEDULE**

**Technical Committees on Automatic Sprinkler Systems**  
**Annual 2012 Revision Cycle Master Schedule**

1. **Proposal Closing Date** - October 1, 2010
2. **PreROP Meetings:** Quincy Marriott, Quincy, MA
  - a. December 1-2, 2010 – Sprinkler System Installation (SSI)
  - b. December 1-2, 2010 – Sprinkler System Discharge (SSD)
  - c. December 2-3, 2010 – Residential Sprinkler Systems (RSS)
3. **ROP Meetings:** Savannah Riverfront Marriott, Savannah, GA
  - a. February 2-3, 2011 - Hanging and Bracing (HBS)
  - b. February 4, 2011 - Private Water Supply (PRI)
  - c. February 7-9, 2011 - Sprinkler System Installation (SSI)
  - d. February 10-11, 2011 - Sprinkler System Discharge (SSD)
  - e. February 14-15, 2011 - Residential Sprinkler Systems (RSS)
4. **TCC-ROP Meeting:** Savannah Riverfront Marriott, Savannah, GA, March 29-30, 2011
5. **ROC Meeting:** Newport Beach Marriott, Newport Beach, CA
  - a. September 19-20, 2011- Sprinkler System Installation (SSI)
  - b. September 22-23, 2011 - Sprinkler System Discharge (SSD)
  - c. September 26-27, 2011 - Residential Sprinkler Systems (RSS)
  - d. September 28, 2011 - Hanging and Bracing (HBS)
  - e. September 29, 2011 - Private Water Supply (PRI)
6. **TCC-ROC Meeting:** Conference Call - TBD

**PART 7 – ANNUAL 2012 PUBLIC PROPOSALS  
AUT-HBS**

13- Log #CP3 AUT-HBS  
(Entire Document)

Final Action:

Submitter: Technical Committee on Hanging and Bracing of Water-Based Fire Protection Systems,  
 Recommendation: Review entire document to: 1) Update any extracted material by preparing separate proposals to do so, and 2) review and update references to other organizations documents, by preparing proposal(s) as required.  
 Substantiation: To conform to the NFPA Regulations Governing Committee Projects.

13- Log #104 AUT-HBS  
(9.1.1.2)

Final Action:

Submitter: Janak B. Patel, Bechtel National Inc.

Recommendation: Revise text to read as follows:

9.1.1.2 Hanger Performance Criteria:

Hangers certified by a registered professional engineer to include all of the following shall be an acceptable alternative to the requirements of Section 9.1:

(1) Hangers, components (e.g. pipe clamp, rod, beam clamp, u-bolt, pipe stand, etc.) shall be designed to support five times the weight of the water-filled pipe span plus 250 lb (114 kg) at each point of piping support. The stresses developed in hanger components due to this design load shall comply American Institute of Steel Construction (AISC) Manual, Allowable Stress Design (ASD), 9<sup>th</sup> Edition. Alternatively, hanger assembly comprised of Listed components in accordance with UL-203, except those exempted by 9.1.1.4, shall be acceptable.

~~(2) These points of support shall be adequate to support the system:~~

(3) The spacing between hangers shall not exceed the value given for the type of pipe as indicated in Table 9.2.2.1(a) or Table 9.2.2.1(b).

(4) Hanger components shall be ferrous.

(5) Detailed calculations shall be documented for record and available for ~~submitted, when required by the reviewing authority, showing stresses developed in hangers components, piping, and fittings and safety factors allowed.~~

Add E 1.2.15 American Institute of Steel Construction (AISC) Manual, Allowable Stress Design, 9<sup>th</sup> Edition.

Substantiation:

\*\*\*\*Insert Include 13\_Log 104\_Sub Here\*\*\*\*

13- Log #105 AUT-HBS  
(9.1.1.4.1)

Final Action:

Submitter: Janak B. Patel, Bechtel National Inc.

Recommendation: Revise text to read as follows:

9.1.1.4.1 Hanger Performance Criteria:

Unless permitted by 9.1.1.4.2 or 9.1.1.4.3, the components of hanger assemblies that directly attach to the pipe or to the building structure shall be listed or qualified to support the design load determined using the Hanger Performance Criteria specified in 9.1.1.2 (1).

Substantiation: This requirement will assure compliance with the Hanger Performance (design) criteria.

“Five times the weight of the water-filled pipe span plus 250 lb (114 kg) at each point of piping support” is a component **Listing (Testing) Criterion** (UL 203) and not a **Performance (Design) Criterion**. The performance (design) criteria for hanger component shall be **consistent**. For example, the trapeze members are designed to support “weight of the water-filled pipe span plus 250 lb (114 kg) at each point of piping support” (See 9.1.1.6.1(a), footnote 2). Therefore it is justifiable that the rest of the hanger components (pipe clamps, c-clamps, etc.) shall be designed using the same performance criteria. Allowable Stress levels in NFPA is not consistent, e.g. a trapeze member stress limit is 15ksi (See 9.1.1.6.1(a), footnote 2) whereas that for a rod is 25ksi (See the Footnote in Table 10.8.3.1.2.2). Linking the allowable stress limits to the American Institute of Steel Construction (AISC) Manual, Allowable Stress Design, 9<sup>th</sup> Edition will provide consistency.

**TABLE - 1**

Pipe Nominal Diameter Sch. 40, (Steel) (In.)	NFPA 13 Hanger Span 'P' (ft)	Weight of Water-Filled Pipe per ft. 'w' Lb./ft	NFPA 13 Bldg. Steel Design Load W <sub>2</sub> = (W <sub>1</sub> +250) (Lbs.)	NFPA 13 Hanger Design Load W <sub>3</sub> = (5W <sub>1</sub> +250) (Lbs.)	ASME B31 Hanger Design Load (MSS SP-58) (Lbs.)	UL 203 Testing Load 'P' (Lbs.)
1	12	2.05	275	373	150	750
1 ¼	12	2.93	285	426	150	750
1 ½	15	3.61	304	521	150	750
2	15	5.13	327	635	150	750
2 ½	15	7.89	368	842	150	850
3	15	10.82	412	1062	200	1050
3 ½	15	13.48	452	1261	210	1250
4	15	16.40	496	1480	250	1500
5	15	23.47	602	2011	360	2000
6	15	31.69	725	2627	480	2650

It can be seen that the UL 203 Test Loads are the highest loads and correspond to the NFPA 13 Hanger Design Loads W<sub>3</sub> (except the loads for the pipe sizes 1 through 2)

**1. Hanger Strength:**

Let us compare the stresses developed in a threaded rod (considering the rod as the weakest link in a typical hanger assembly i.e. pipe clamp, threaded rod, and C- clamp). The stresses are tabulated in TABLE 2.

Tensile Stress in Hanger Rod

TABLE 2												
Pipe Dia	Rod Size	Root Area	NFPA 13 Bldg. Steel Design Load	Tensile Stress (psi)	NFPA 13 Hanger Design Loads $W_3 = 5W_1 + 250$ (Lbs.)	Tensile Stress (psi)	ANSI B31.1 B31.3 Hanger Design Loads (Lbs.)	Tensile Stress (psi)	UL203 Loads (Lbs.)	Tensile Stress (psi)	Typical Rated Load Capacity 'P'	Tensile Stress (psi)
1-4	3/8	0.068	496	7295	1480	21765	250	3677	1500	22059	610	8971
5-6	1/2	0.126	725	5758	2627	20850	480	3810	2650	21032	1130	8969
8	5/8	0.202	965	4780	3828	18951	760	3763	4050	20050	1810	8961

Rod Material A36: Yield Strength = 36,000 psi, Ultimate Strength = 58,000 psi, Modulus of Elasticity  $E = 30 \times 10^6$  psi.

The highest stress is developed when the rod is tested under the UL Testing criteria. The stress level corresponds very much to the stresses that developed due to NFPA 13 Hanger Design Load (5W+250).

It should be noted that the trapeze members are designed based on 15000 psi developed when subjected to a 'Steel Design Load' (W+250) [NFPA 13 (2007), Table 9.1.1.6.1(a)]. The stresses developed due to the 'Steel' (Design) Loads are smaller than that are allowed by the AISC 'Allowable Stress Design' (ASD) (Error! Reference source not found. Error! Reference source not found.) criteria i.e.  $0.6 \times$  Yield Stress =  $0.6 \times 36000 = 21,600$  psi or  $0.6 \times 35000 = 21,000$  psi for ASTM A53, Gr. B or A106, Gr. B Pipe.

13- Log #547 AUT-HBS  
(9.1.1.6)

Final Action:

Submitter: E. Parks Moore, S & S Sprinkler Company, LLC

Recommendation: Additional text should be added to provide guidance for the sizing and restraint of trapeze hangers providing cantilevered support of the piping whereby the trapeze member is attached to two joists or other structural members but extends out beyond the last joist to support the piping.

Substantiation: No guidance is currently provided by NFPA 13 for the sizing or design of these types of supports which are, at times, required.

13- Log #549 AUT-HBS  
(9.1.1.6)

Final Action:

Submitter: E. Parks Moore, S & S Sprinkler Company, LLC

Recommendation: Design guidelines should be provided for the sizing and installation of wall-mounted hanger brackets frequently constructed of angle iron or other similar materials.

Substantiation: These brackets are commonly needed where overhead support is not available or adequate. They are typically constructed by means of a vertical and horizontal member and an angular cross support, creating a triangular-shaped support. There are currently no provisions or guidelines for this type of support in NFPA 13

13- Log #106 AUT-HBS  
(9.1.1.6.1)

Final Action:

Submitter: Janak B. Patel, Bechtel National Inc.

Recommendation: Revise text to read as follows:

9.1.1.6.1 Trapeze members shall be designed in accordance with 9.1.1.2 (1). For trapeze hangers...Table 9.1.1.6.1 (a).

\*\*\*\*Insert Table 9.1.1.6.1(a) Here\*\*\*\*

(1) Top values .....

(2) The Table is based on .....stress of 21 ksi and a midspan concentrated load from maximum spans permitted in Table 9.2.2.1 (a).

Substantiation: 1. This Table is for the American measurement system i.e. 'foot-pound-second (fps)' and shall not be mixed with Metric System. Or provide the Section Modulus data too, in mm<sup>3</sup>, here.

2. The criterion is already stated in the footnote of Table 9.1.1.6.1(a) and is consistent with Hanger Performance (design) Criteria proposed in 9.1.1.2 (1).

3. The allowable stress 21 ksi is based on 0.6 x Yield strength of ASTM A53, Gr B and ASTM A106, Gr. B (35 ksi) as permitted by the American Institute of Steel Construction (AISC) Manual, Allowable Stress Design, 9<sup>th</sup> Edition. ASTM A36 is inclusive as its Yield Strength is 36 ksi.

4. Maximum span for 1" and 1 ¼" pipe is 12' (not 15').

Table 9.1.1.6.1 (a) Section Modulus Required for Trapeze Members (In<sup>3</sup>)

Span Of Trapeze	Nominal Diameter of Pipe Being Supported											
	1 25 mm	1.25 32 mm	1.5 40 mm	2 50 mm	2.5 65 mm	3 80 mm	3.5 90 mm	4 100 mm	5 125 mm	6 150 mm	8 200 mm	10 250 mm
1'-6"	0.06	0.06	0.06	0.07	0.07	0.08	0.09	0.09	0.11	0.13	0.17	0.23
1'-6"	0.06	0.06	0.07	0.07	0.08	0.09	0.10	0.11	0.13	0.16	0.21	0.29
2'-0"	0.08	0.08	0.08	0.09	0.10	0.11	0.11	0.12	0.15	0.17	0.23	0.31
2'-0"	0.08	0.08	0.09	0.09	0.11	0.12	0.13	0.14	0.17	0.21	0.29	0.39
2'-6"	0.10	0.10	0.11	0.11	0.12	0.13	0.14	0.15	0.18	0.21	0.29	0.39
2'-6"	0.10	0.10	0.11	0.12	0.13	0.15	0.16	0.18	0.22	0.26	0.36	0.49
3'-0"	0.12	0.12	0.13	0.13	0.15	0.16	0.17	0.18	0.22	0.26	0.35	0.46
3'-0"	0.12	0.12	0.13	0.14	0.16	0.18	0.19	0.21	0.26	0.31	0.43	0.59
4'-0"	0.16	0.16	0.17	0.18	0.19	0.21	0.23	0.24	0.29	0.34	0.46	0.62
4'-0"	0.16	0.16	0.17	0.19	0.21	0.24	0.26	0.28	0.34	0.41	0.57	0.78
5'-0"	0.19	0.20	0.21	0.22	0.24	0.26	0.28	0.31	0.36	0.43	0.58	0.77
5'-0"	0.20	0.20	0.22	0.23	0.26	0.29	0.32	0.35	0.43	0.52	0.72	0.98
6'-0"	0.23	0.24	0.25	0.27	0.29	0.32	0.34	0.37	0.44	0.51	0.69	0.93
6'-0"	0.24	0.24	0.26	0.28	0.32	0.35	0.39	0.43	0.52	0.62	0.86	1.17
7'-0"	0.27	0.28	0.30	0.31	0.34	0.37	0.40	0.43	0.51	0.60	0.81	1.08
7'-0"	0.27	0.29	0.30	0.33	0.37	0.41	0.45	0.50	0.60	0.73	1.00	1.37
8'-0"	0.31	0.32	0.34	0.36	0.39	0.42	0.45	0.49	0.58	0.68	0.92	1.24
8'-0"	0.31	0.33	0.35	0.37	0.42	0.47	0.52	0.57	0.69	0.83	1.14	1.56
9'-0"	0.35	0.36	0.38	0.40	0.44	0.47	0.51	0.55	0.66	0.77	1.04	1.39
9'-0"	0.35	0.37	0.39	0.42	0.47	0.53	0.58	0.64	0.77	0.93	1.29	1.76
10'-0"	0.39	0.40	0.42	0.45	0.48	0.53	0.57	0.61	0.73	0.85	1.15	1.55
10'-0"	0.39	0.41	0.43	0.47	0.53	0.59	0.65	0.71	0.86	1.04	1.43	1.96

13- Log #17 AUT-HBS  
(Table 9.1.1.6.1(b))

Final Action:

Submitter: Stanley M. Shepp, Southwest Automatic Sprinklers, Inc.

Recommendation: Add text to read as follows:

Available section moduli of various sizes of uni-strut should be added to this table.

Substantiation: I have seen exorbitant loads placed on uni-strut and AHJ's that don't know enough to question it when seen. Example: 10 ft span of uni-strut w/4 in. sch. 40 main 1 ft-o in. from one end & a second 4 in. sch. 40 main 1 ft-0 in. away from the first main. UNBELIEVABLE!!!

13- Log #66 AUT-HBS  
(9.1.1.6.2)

Final Action:

Submitter: Peter T. Schwab, Wayne Automatic Fire Sprinklers, Inc.

Recommendation: Add new text to read as follows:

9.1.1.6.2 For trapeze hangers larger than 10 ft (3.0 m), a registered professional engineer shall certify the requirements of the trapeze member.

Substantiation: There are more and more situations where construction requires trapeze spans larger than 10'-0". A professional engineer should sign off on the member or the committee should add more options to Table 9.1.1.6.1(a).

13- Log #107 AUT-HBS  
(9.1.1.6.5)

Final Action:

Submitter: Janak B. Patel, Bechtel National Inc.

Recommendation: Revise text to read as follows:

9.1.1.6.5\* All components of each hanger assembly.....and be sized to support the suspended sprinkler pipe in accordance with 9.1.1.2 (1).

~~9.1.1.6.5\* Hanger Components are .....to that of the other hanger components: (Delete entirely)~~

Substantiation: The criterion is already stated in the footnote of Table 9.1.1.6.1(a) and is consistent with the Hanger Performance (design) criteria proposed in 9.1.1.2 (1).

13- Log #108 AUT-HBS  
(9.1.1.6.6)

Final Action:

Submitter: Janak B. Patel, Bechtel National Inc.

Recommendation: 9.1.1.6.6 Delete the section in its entirety.

~~The ring, strap, or clevis installed .....trapeze member: (Delete entirely)~~

Substantiation: Proposed 9.1.1.6.5 provides design criteria for the trapeze assembly components. Therefore, this section is not required.

13- Log #256 AUT-HBS  
(9.1.1.6.7 and 9.1.1.6.8)

Final Action:

Submitter: Thomas G. Wellen, American Fire Sprinkler Association, Inc.

Recommendation: Revise text to read as follows:

9.1.1.6.7 Holes for bolts or rod shall not exceed 1/16 in. (1.6 mm) greater than the diameter of the bolt.

9.1.1.6.8 Bolts or rods shall be provided with a flat washer and nut.

Substantiation: The standard refers only to bolts. This will also apply to all thread rod.

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13- Log #120 AUT-HBS  
(9.1.1.7)

Final Action:

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Submitter: Wilton Marburger, Myers Risk Services

Recommendation: Revise text to read as follows:

9.1.1.7 Support of and Contact with Non-System Components. Sprinkler piping or hangers shall not be used to support or come into contact with non-system components due to issues of increased stress from added weight, corrosion with steel and compatibility with CPVC piping.

9.1.1.7.1 Items including but not limited to flexible wire and cabling contain incompatible & environmental stress cracking agents which can cause system degradation through contact with CPVC plastic pipe and components.

A.9.1.1.7 The rules covering the hanging of sprinkler piping take into consideration the weight of water-filled pipe plus a safety factor. No allowance has been made for the hanging of non-system components from sprinkler piping or any possible system degradation resulting from the contact of non-system components to the systems. NFPA 13 provides the option to support sprinkler piping from other sprinkler piping where the requirements of 9.1.1.2 are met.

Substantiation: Multiple claims from system failure due to pipe breaks have occurred from compatibility issues between flexible wire & cables and sprinkler pipe. Primarily, CPVC is proven to be incompatible with and endangered by some rubber and flexible plastic materials. Pipe failures are known to exist from these materials contacting sprinkler pipe at solvent cement joints and on stressed straight runs of pipe.

Currently, 9.1.1.7 contains no explanation as to why support on non-system components is a serious danger and the Appendix portion of A.9.1.1.7 addresses solely weight concerns from added mechanical stress and provides no education or insight into the potentially hazardous and real world dangers of incompatibility. Furthermore, no mention of possible outcomes from non-system and system components contacting each other is addressed.

Note: Supporting material is available for review at NFPA Headquarters.

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13- Log #109 AUT-HBS  
(9.1.2.2)

Final Action:

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Submitter: Janak B. Patel, Bechtel National Inc.

Recommendation: Revise text to read as follows:

9.1.2.2 Rods of smaller diameters than indicated in Table 9.1.2.1 shall be permitted where the hanger assembly has been tested and listed by a testing laboratory and installed within the limits of pipe sizes expressed in individual listings or the hanger assembly is analytically qualified to support design load specified in the Hanger Performance (Design) criteria in 9.1.1.2 (1).

Substantiation: This requirement will assure compliance with the proposed Hanger Performance (Design) Criteria in 9.1.1.2 (1) and the American Institute of Steel Construction (AISC) Manual, Allowable Stress Design, 9<sup>th</sup> Edition.

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13- Log #110 AUT-HBS  
(9.1.2.3)

Final Action:

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Submitter: Janak B. Patel, Bechtel National Inc.

Recommendation: Revise text to read as follows:

9.1.2.3\* Hanger rods shall be installed so that lateral gravity loads due to gravity is are not induced on the rods

Substantiation: The sentence is revised to state the situation technically correct.

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13- Log #257 AUT-HBS  
(9.2.3.2)

Final Action:

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Submitter: Thomas G. Wellen, American Fire Sprinkler Association, Inc.

Recommendation: Revise text to read as follows:

9.2.3.2.2\* Unless the requirements of 9.2.3.2.3 are met, where sprinklers are spaced less than 6 ft (1.8 m) apart, hangers spaced up to a maximum of 12 ft (3.7 m) shall be permitted.

9.2.3.2.3 For pipes provided with welded outlets, hanger spacing shall be according to Table 9.2.2.1(a) or Table 9.2.2.1(b).

9.2.3.2.34\* Starter lengths less than 6 ft (1.8 m) shall not require a hanger, unless on the end line of a side feed system or where an intermediate cross main hanger has been omitted.

A.9.2.3.34

Substantiation: This will address 21 ft, more or less, sticks of pipe provided with welded outlets. This will clarify that only one or two hangers will be required according to the table.

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13- Log #160 AUT-HBS  
(9.2.3.2.1.1 and A.9.2.3.2.1.1)

Final Action:

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Submitter: Roland J. Huggins, American Fire Sprinkler Association, Inc.

Recommendation: Add the following text to read as follows:

9.2.3.2.1.1 A single short section of pipe does not require a hanger when the cumulative distance between hangers on the branch line does not exceed the spacing required by 9.2.2.

A.9.2.3.2.1.1. When a branchline contains two elbows to go around an obstruction, a short section of pipe is considered adequately supported by the hangers on the adjacent pipe sections when the overall distance between hangers does not exceed the requirements in Table 9.2.2.1(a).

9.2.4.1.1 A single short section of pipe does not require a hanger when the cumulative distance between hangers on the main does not exceed the spacing required by 9.2.2

A.9.2.4.1.1. When a main contains two elbows to offset the run of pipe, a short section of pipe is considered adequately supported by the hangers on the adjacent pipe sections when the overall distance between hangers does not exceed the requirements in Table 9.2.2.1(a).

Substantiation: This text is similar to that from the Sprinkler Handbook but limits it to just one section of short pipe without a hanger.

It seems appropriate to include the same criteria for the mains.

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13- Log #525 AUT-HBS  
(9.2.3.4.1)

Final Action:

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Submitter: Victoria B. Valentine, National Fire Sprinkler Association, Inc.

Recommendation: Modify the sentence to begin, "For steel pipe, ..."

Substantiation: The section that follows this one is indicated that it is for copper tube. However, a type of pipe is not specified on this section.

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13- Log #258 AUT-HBS  
(9.2.4)

Final Action:

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Submitter: Thomas G. Wellen, American Fire Sprinkler Association, Inc.

Recommendation: Revise text to read as follows:

**9.2.4 Location of Hangers on Mains.**

9.2.4.1 Unless the requirements of Sections 9.2.4.23, 9.2.4.34, 9.2.4.45, or 9.2.4.56 are met, hangers for mains shall be in accordance with Section 9.2.2, between each branch line, or on each section of pipe, whichever is the lesser dimension.

9.2.4.2 For pipes provided with welded outlets, hanger spacing shall be according to Table 9.2.2.1(a) or Table 9.2.2.1(b).

9.2.4.23 For cross mains in steel pipe systems in bays having two branch lines, the intermediate hanger shall be permitted to be omitted, provided that a hanger attached to a purlin is installed on each branch line located as near to the cross main as the location of the purlin permits.

9.2.4.23.1 The remaining branch line hangers shall be installed in accordance with Section 9.2.3.

9.2.4.34 For cross mains in steel pipe systems only in bays having three branch lines, either side or center feed, one (only) intermediate hanger shall be permitted to be omitted, provided that a hanger attached to a purlin is installed on each branch line located as near to the cross main as the location of the purlin permits.

9.2.4.34.1 The remaining branch line hangers shall be installed in accordance with Section 9.2.3.

9.2.4.45 For cross mains in steel pipe systems only in bays having four or more branch lines, either side or center feed, two intermediate hangers shall be permitted to be omitted, provided the maximum distance between hangers does not exceed the distances specified in Section 9.2.2 and a hanger attached to a purlin on each branch line is located as near to the cross main as the purlin permits.

9.2.4.56 At the end of the main, intermediate trapeze hangers shall be installed unless the main is extended to the next framing member with a hanger installed at this point, in which event an intermediate hanger shall be permitted to be omitted in accordance with Sections 9.2.4.23, 9.2.4.34, and 9.2.4.45.

Substantiation: This will address 21 ft, more or less, sticks of pipe provided with welded outlets. The "whichever the lesser dimension" statement requires a hanger between each welded outlet for branch lines on one pipe. This will clarify that only one or two hangers will be required according to the table.

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13- Log #523 AUT-HBS  
(9.2.6)

Final Action:

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Submitter: Victoria B. Valentine, National Fire Sprinkler Association, Inc.

Recommendation: Add criteria for pipe stands to parallel that of NFPA 15.

Substantiation: Actual text for the sections has not been included as a task group for NFPA 15 is still working on the recommendations and criteria. Information should be available by the time of the ROP meeting for the Technical Committee on Hanging and Bracing of Water-Based Fire Protection Systems. In addition to sprinkler systems, other water-based fire protection systems use the guidelines provided in Chapter 9. Guidance should be provided on proper installation of a pipe stand.

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13- Log #548 AUT-HBS  
(9.2.6)

Final Action:

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Submitter: E. Parks Moore, S & S Sprinkler Company, LLC

Recommendation: The pipestand sizing rules and requirements that are currently included in NFPA 15 should be incorporated into NFPA 13. See NFPA 15, 2007 edition, section 6.3.2.

Substantiation: NFPA 13 currently gives no sizing requirements for the support of piping when pipestands are necessary other than the requirement for the support of 5 times the weight of water-filled pipe plus 250 pounds. Pipestands are frequently needed for the support of piping where traditional hangers are not feasible or support of piping from the overhead structure is undesirable. It should be noted that the NFPA 15 T.C. currently has a task group assigned to the evaluation of the existing pipestand requirements in NFPA 15

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13- Log #111 AUT-HBS  
(9.2.6.1)

Final Action:

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Submitter: Janak B. Patel, Bechtel National Inc.

Recommendation: Revise text to read as follows:

~~9.2.6.1 Pipe stand shall be designed to support a minimum of five times the weight of the water-filled pipe span plus 250 lb (114 kg):~~

Substantiation: "five times the weight of the water-filled pipe span plus 250 lb (114 kg) at each point of piping support" is a component listing criteria (UL 203) and not a performance (design) criterion. The performance (design) criteria for hanger components shall be consistent. For example, trapeze members are designed to support "weight of the water-filled pipe span plus 250 lb (114 kg) at each point of piping support". Therefore it is justifiable that the rest of the hanger components (pipe clamps, c-clamps, stand, etc.) shall be designed using the same performance criteria. Pipe stand is included in the new proposal on 9.1.1.2.

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13- Log #142 AUT-HBS  
(9.3.2.3(1)(c) (New) )

Final Action:

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Submitter: Kenneth W. Wagoner, Parsley Consulting Engineers

Recommendation: Add new text to read as follows:

9.3.2.3 Systems having more flexible couplings than required by this section shall be provided with additional sway bracing as required in 9.3.5.3.8. The flexible couplings shall be installed as follows:

(1)\* Within 24 in. (610 mm) of the top and bottom of all risers, unless the following provisions are met:

(a) In risers less than 3 ft (0.9 m) in length, flexible couplings are permitted to be omitted.

(b) In risers 3 ft to 7 ft (0.9 m to 2.1 m) in length, one flexible coupling is adequate.

(c) Flexible couplings are permitted to be omitted on riser nipples, regardless of length.

Substantiation: This is the intent of the current annex section A.9.3.2.3(1), and locating it in the standard itself clears any confusion on it's applicability.

---

13- Log #520 AUT-HBS  
(9.3.2.4)

Final Action:

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Submitter: Victoria B. Valentine, National Fire Sprinkler Association, Inc.

Recommendation: Modify the section to read:

Flexible couplings for drops to hose lines, rack sprinklers, and mezzanines, and freezers shall be installed ... "

Substantiation: A freezer may have a drop that is shorter than 15 ft (4.6 m), which means it may not be covered under Section 9.3.2.3(5). However, the freezer may have a differential movement that could subject the pipe to damage.

---

13- Log #130 AUT-HBS  
(9.3.3)

Final Action:

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Submitter: Kraig Kirschner, AFCON

Recommendation: Page 13-100 9.3.3 Seismic Separation Assembly  
9.3.3.3 "...Include a four-way brace bracing ...".

Substantiation: Bracing denotes methodology and enhances clarity.  
AHJ's often misconstrue four-way as a single assembly or product.  
Standardize terminology.

---

13- Log #198 AUT-HBS  
(9.3.4.8)

Final Action:

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Submitter: Robert G. Caputo, Fire & Life Safety America / Rep. American Fire Sprinkler Assn.

Recommendation: Revise text to read as follows:

9.3.4.8 Where required, the clearance shall be filled with a flexible an approved material that is compatible with the piping material.

Substantiation: Model building codes require the annular space around piping penetrations through fire rated assemblies (other than sprinkler penetrations of ceiling membranes) to be filled with a listed penetration sealant tested in accordance with ASTM E 814, *Test Methods for Fire Tests of Through-Penetration Fire Stops*, and that are flexible as installed. AHJ's and specifically the CASFM will not accept clearances filled with certain brands of rated fire stop materials because flexibility values are either not known or thought to have not enough flexibility to meet the intent of Section 9.3.4.8. The standard should either provide a quantified percentage of flexibility required or remove the term from this section for clarity.

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13- Log #442 AUT-HBS  
(9.3.4.10)

Final Action:

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Submitter: Kenneth E. Isman, National Fire Sprinkler Association, Inc.

Recommendation: Add a new Section 9.3.4.10 as follows:

9.3.4.10 No clearance shall be required where piping is supported by holes through structural members as permitted by 9.1.1.5.3.

Substantiation: Providing clearance through structural members in this case will prevent the structural member from properly supporting the pipe. The pipe will move with the structural member and therefore clearance will not be needed. This proposal was developed by the NFSA Engineering and Standards Committee.

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13- Log #67 AUT-HBS  
(9.3.5.1.4 (New) )

Final Action:

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Submitter: Peter T. Schwab, Wayne Automatic Fire Sprinklers, Inc.

Recommendation: Add new text to read as follows:

9.3.5.1.4 Bracing requirements of Section 9.3.5.1.1 shall not apply to drain piping.

Substantiation: Drain piping is not a critical working component of the sprinkler system. Piping for the drains should be specifically exempt from bracing requirements.

13- Log #131 AUT-HBS  
(9.3.5.2)

Final Action:

Submitter: Kraig Kirschner, AFCON

Recommendation: Revise text to read as follows:

Page 13-100 9.3.5.2 ~~Sway Bracing Design Listing~~

9.3.5.2.1 Sway brace fittings and components directly attached to the brace element, system pipe or building structure shall be listed.

9.3.5.2.2 Sway brace fittings and components shall be tested for listing at maximum eccentricity.

9.3.5.2.3 Sway Bracing Design: Component Material.

9.3.5.3.1 Sway brace components shall be ferrous.

9.3.5.2.4 Sway Bracing Design.

RENUMBER SUBSEQUENT PARAGRAPHS ACCORDINGLY.

Substantiation: Create new listing section and sequence similar to hanger section to enhance familiarity. Provides location for future standard requirements and refinements. SEE ATTACHED – Exhibit A-F

Note: Supporting material is available for review at NFPA Headquarters.

13- Log #514 AUT-HBS  
(9.3.5.2.5)

Final Action:

Submitter: Russell P. Fleming, National Fire Sprinkler Association, Inc.

Recommendation: Revise 9.3.5.2.5 to read as follows:

The distance between the last brace and the end of the main shall not exceed 6 ft (1.8 m), or 12 ft (3.6 m) if the main ends in a connection to another main that is longitudinally braced.

Substantiation: Current wording is confusing to the sprinkler industry, since it is not clear to some if the 6 ft requirement applies to all runs of main, or only those that have no further connections to other mains through elbows or tees. When the Committee reduced the allowable distance between the last lateral brace and the end of the main from 20 ft in the 2002 edition to 6 ft in the 2007 edition, the substantiation referenced concerns for the cantilevered loads of the end branch lines. This explanation was carried forward in the commentary in the NFPA's *Automatic Sprinkler Systems Handbook*, but has led some to believe there is no concern if those loads are not cantilevered.

If the intent is not to require a brace within 6 ft of the end of a run when the main turns, the Committee has failed to provide an alternative maximum distance. This means the brace spacing would default to the maximum 40 ft spacing between lateral braces. Where two runs are interconnected by an unbraced 10 ft jog (allowed by Section 9.3.5.11.3), this could easily be interpreted to allow a combined pipe run of 50 ft between lateral braces, and possibly even 90 ft, which we suspect is not the intent of the Committee.

13- Log #443 AUT-HBS  
(9.3.5.3.1)

Final Action:

Submitter: Kenneth E. Isman, National Fire Sprinkler Association, Inc.

Recommendation: Revise Section 9.3.5.3.1 to read as follows:

Lateral sway bracing shall be provided on all feed and cross mains regardless of size and all branch lines and other piping with the exception of drain piping with a diameter of 2 ½ in. (65 mm) and larger.

Substantiation: Earthquake bracing is in place to make sure that parts of the sprinkler system that are essential to system performance are kept in place during an earthquake. Drain piping is not necessary for the successful operation of a sprinkler system. The term "other piping" is currently being interpreted by many AHJ's as applying to drain piping, which is causing unnecessary cost to brace such piping.



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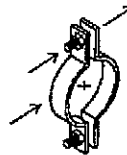
09-21-10

NFPA 13 Chapter 9 should be more specific about the use, features and characteristics necessary of listed sway brace fittings. Lateral and longitudinal sway braces are composed of listed components whose geometry and ability is unique to their orientation and function.

Longitudinal sway brace fittings and lateral sway brace fittings differ in both structure and function. The structural ability of the fastener flange of a listed longitudinal sway brace fitting is critical to its function. Their UL Sub 203A listing specifies assembly as a longitudinal sway brace fitting in conformance to NFPA 13. This requires alignment of the fitting to resist eccentric seismic force parallel to the fitting bolt flange. This flange is structurally stronger and more able to resist force applied parallel to the flat and against the edge. See drawing A.



Drawing A



Drawing B

Lateral sway brace fittings do not look similar to longitudinal sway brace fittings for two reasons. Practically, it is problematic to achieve the required structural ability of the bolt flange surface when eccentric seismic force is applied perpendicular against the flat – see **drawing B**. In this orientation the ears are less rigid and therefore more susceptible to deformation. Further, when eccentric force is applied, this geometry is susceptible to rotation on the system pipe.

Worse still, pipe clamps look similar to longitudinal sway brace fittings. Even worse, fire sprinkler contractors routinely install pipe clamps as sway brace fittings.

September 21, 2010 **EXHIBIT A**

Supporting Material, Document 13, Log # 131, A2012

### Fig. 4A - Pipe Clamp for Sway Bracing

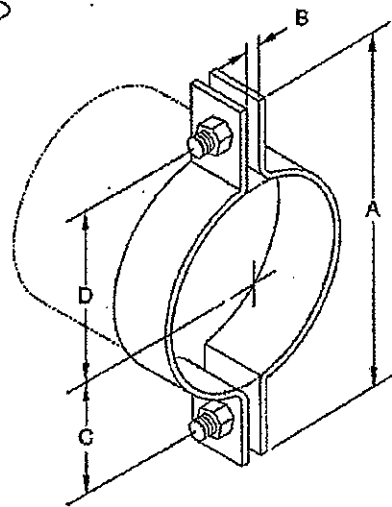
Size Range — 4" thru 8" pipe For sizes smaller than 4" use Fig. 4.

Material — Carbon Steel

Function — For bracing pipe against sway and seismic disturbance.

Approvals — Underwriters' Laboratories Listed in the USA (UL) and Canada (cUL) 4" thru 8". Included in our Seismic Restraints Catalog approved by the State of California Office of Statewide Health Planning and Development (OSHPD).

Installation Instructions — The Fig. 4A is the "braced pipe" attachment component of a longitudinal (lateral) or riser brace assembly.



IT IS PROBLEMATIC  
THAT LISTED LOAD RATING  
WOULD BE IDENTICAL FOR  
LATERAL AND LONGITUDINAL  
ORIENTATION.

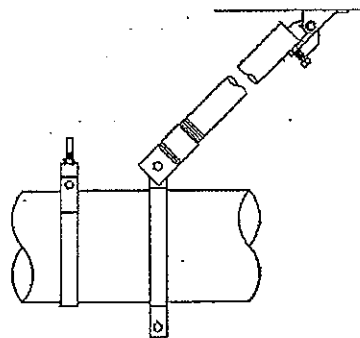


Fig. 4A - Longitudinal Brace

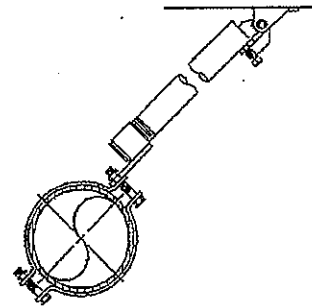


Fig. 4A - Lateral Brace

**Dimensions • Weights**

Pipe Sizes	A	B	C	D	Bolt Size	Max. Horizontal Design Load	Approx. Wt./100
4	8½	9/16	3¾	3¼ <sup>1/16</sup>	1/2	2015	221
5	9¾	9/16	3¾	4¾	1/2	2015	253
6	11½	5/8	5	5¾	1/2	2015	513
8	13¼	3/4	6¼ <sup>1/16</sup>	6¾	1/2	2015	601

September 21, 2010 EXHIBIT B

## Fig. 4 - Standard Pipe Clamp

**Size Range** — (Fig. 4) Size 1/2" thru 30" pipe.

**Size Range** — (Fig. 4F) Size 1/2" thru 2 1/2" copper tubing

**Material** — Carbon Steel

**Function** — Recommended for the suspension of non-insulated pipe or insulated pipe with Fig. 220 shields. (Use Fig. 330 Weldless Eye Nut, Fig. 102 Eye Rod or Fig. 101 Welded Eye Rod.) Also recommended for attachment of sway bracing up to 3 1/2" pipe size, for larger pipe sizes use Fig. 4A, Fig. 4F and Fig. 4PVC are designed to reduce noise and vibration and/or prevent electrolysis.

**Approvals** — Underwriters' Laboratories Listed in the USA (UL), Canada (cUL) 1/2" - 8", and approved by Factory Mutual Engineering, 3/4" - 8". Federal Specification WW-H-171E, Type 4, 1 1/2" thru 24" and Manufacturers Standardization Society SP-69, Type 4.

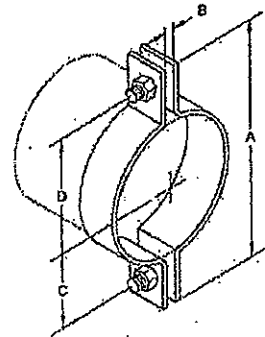
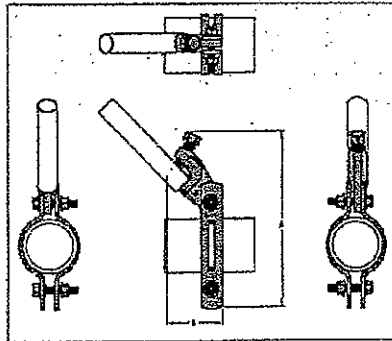
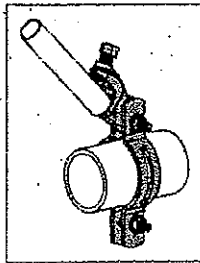


Fig. 4

Note — When the Fig. 4 is used as a sway brace,

**NO LISTING AS A SWAY BRACE FITTING.  
NO LISTED LOAD RATING**

September 21, 2010 EXHIBIT C



- For use in (lateral) and longitudinal sway bracing applications
- Standard electro-galvanized finish provides superior corrosion protection
- Hot-dipped galvanized finish is also available as special order

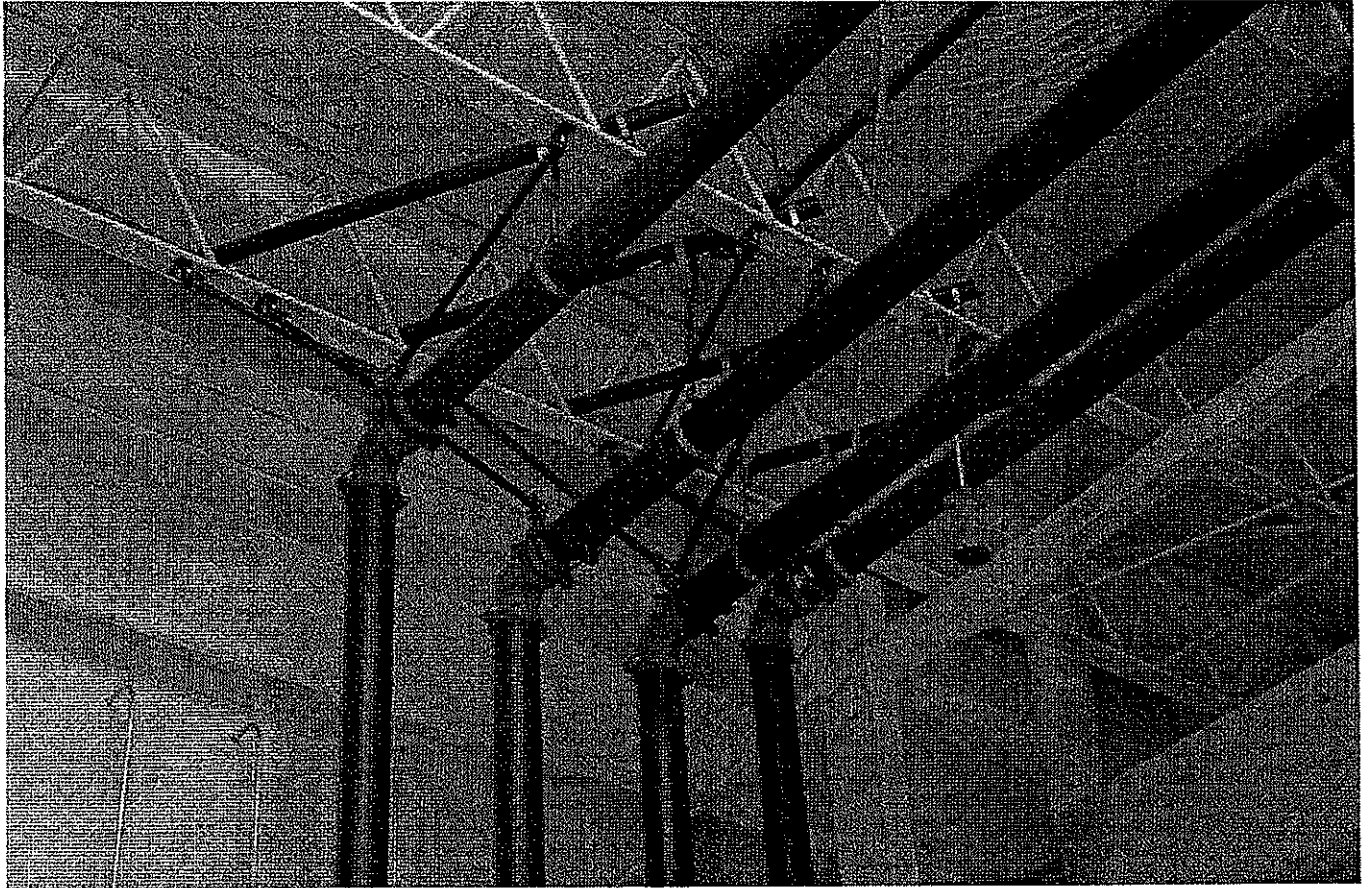
IT IS PROBLEMATIC  
THAT LISTED LOAD RATING  
WOULD BE IDENTICAL FOR  
LATERAL AND LONGITUDINAL  
ORIENTATION.

### Specifications

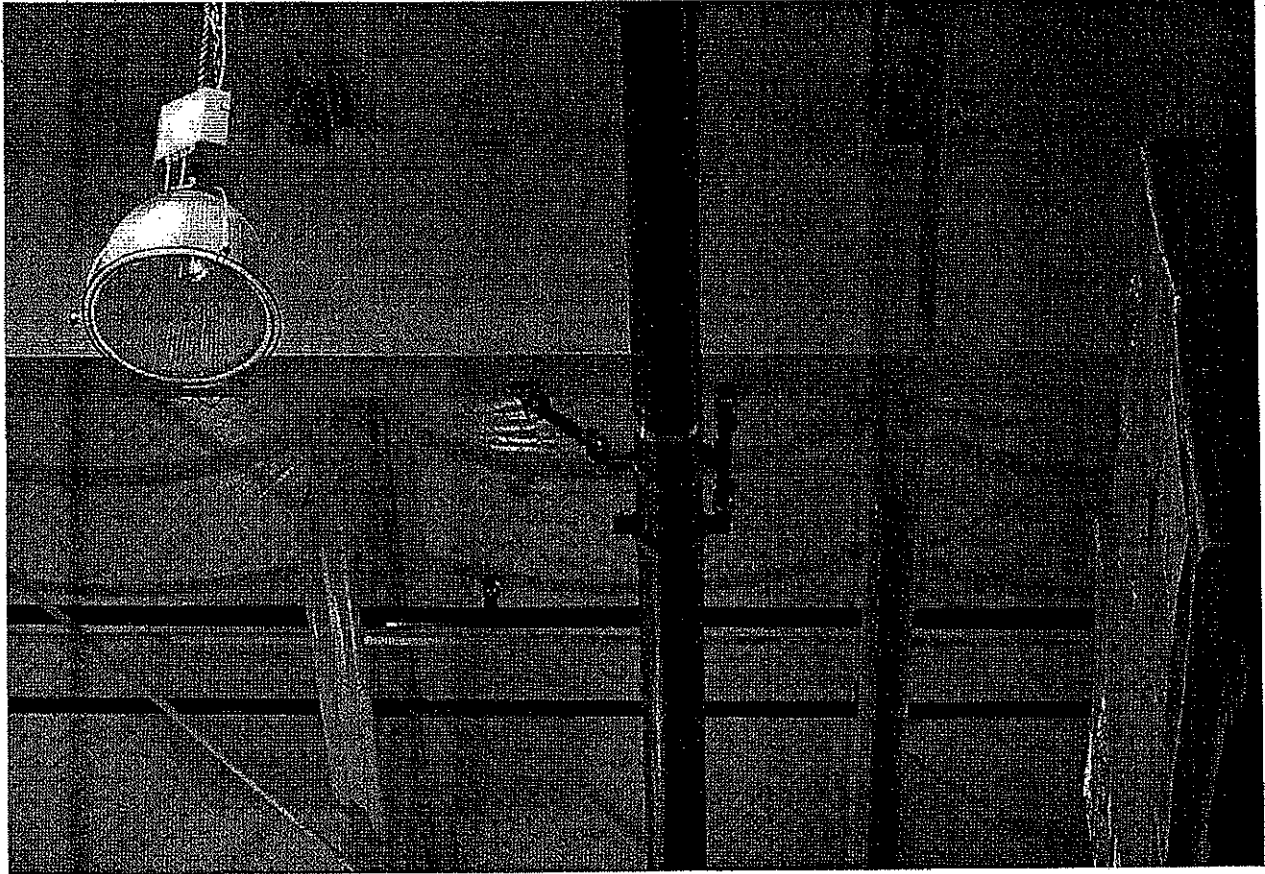
Part Number	Description	Service Pipe Size in (mm)	UL Listed	UL Listed	UL Listed	UL Listed	FM Approved	FM Approved	A in (mm)	B in (mm)
			Load SCH 7 Lateral Bracing lbs (N)	Load SCH 10/40 Lateral Bracing lbs (N)	Load SCH 7 Longitudinal Bracing lbs (N)	Load SCH 10/40 Longitudinal Bracing lbs (N)	Design Load SCH 7/10/40 Lateral Bracing lbs (N)	Design Load SCH 7/10/40 Longitudinal Bracing lbs (N)		
CSBSTU0100EG	1" (25 mm) Standard Universal Sway Brace EG	1 (25)	N/A	655 (2,913)	N/A	655 (2,913)	2,400** (10,675)	2,500** (11,120)	6-7/8 (174.6)	1 (25)
CSBSTU0125EG	1-1/4" (32 mm) Standard Universal Sway Brace EG	1-1/4 (32)	655 (2,913)	655 (2,913)	655 (2,913)	655 (2,913)	2,400 (10,675)	2,500 (11,120)	7-3/8 (187.4)	1 (25)
CSBSTU0150EG	1-1/2" (40 mm) Standard Universal Sway Brace EG	1-1/2 (40)	655 (2,913)	655 (2,913)	655 (2,913)	655 (2,913)	2,400 (10,675)	2,500 (11,120)	7-3/4 (196.9)	1 (25)
CSBSTU0200EG	2" (50 mm) Standard Universal Sway Brace EG	2 (50)	3,000* (13,344)	3,000* (13,344)	655 (2,913)	655 (2,913)	3,300 (14,679)	3,200 (14,234)	8-1/8 (206.4)	1-13/16 (30.2)
CSBSTU0250EG	2-1/2" (65 mm) Standard Universal Sway Brace EG	2-1/2 (65)	3,000* (13,344)	3,000* (13,344)	2,015 (8,963)	2,015 (8,963)	3,300 (14,679)	3,200 (14,234)	8-7/8 (225.4)	1-13/16 (30.2)
CSBSTU0300EG	3" (80 mm) Standard Universal Sway Brace EG	3 (80)	3,000* (13,344)	3,000* (13,344)	2,015 (8,963)	2,015 (8,963)	3,300 (14,679)	3,200 (14,234)	9-3/8 (238.1)	1-13/16 (30.2)
CSBSTU0400EG	4" (100 mm) Standard Universal Sway Brace EG	4 (100)	3,000* (13,344)	3,000* (13,344)	2,015 (8,963)	2,015 (8,963)	4,500 (20,016)	4,250 (18,904)	10-5/8 (269.9)	1-1/2 (38.1)
CSBSTU0500EG	5" (125 mm) Standard Universal Sway Brace EG	5 (125)	3,000* (13,344)	3,000* (13,344)	2,015 (8,963)	2,015 (8,963)	4,500 (20,016)	4,250 (18,904)	12-1/8 (308.0)	1-1/2 (38.1)
CSBSTU0600EG	6" (150 mm) Standard Universal Sway Brace EG	6 (150)	3,000* (13,344)	3,000* (13,344)	2,015 (8,963)	2,015 (8,963)	4,500 (20,016)	3,500 (15,560)	13-5/8 (346.1)	2 (50.8)
CSBSTU0800EG	8" (200 mm) Standard Universal Sway Brace EG	8 (200)	N/A	3,000* (13,344)	N/A	2,015 (8,963)	5,500** (24,465)	4,250** (18,904)	15-3/4 (400.1)	2 (50.8)
CSBSTU1000EG	10" (250 mm) Standard Universal Sway Brace EG	10 (250)	N/A	3,000* (13,344)	N/A	3,000** (13,344)	5,500** (24,465)	4,250** (18,904)	18 (457.2)	2 (50.8)

\* When using angle iron instead of brace pipe load ratings reduced to 2,015 lbs or (8,963 N)  
 \*\* Not applicable for SCH 7.

September 21, 2010 EXHIBIT D



September 21, 2010 EXHIBIT E



September 21, 2010 EXHIBIT F

13- Log #554 AUT-HBS  
(Table 9.3.5.3.2(a) through 9.3.5.3.2(e))

Final Action:

Submitter: Larry Keeping, Vipond Fire Protection

Recommendation: In Tables 9.3.5.3.2(a), 9.3.5.3.2(b), 9.3.5.3.2(c), 9.3.5.3.2(d) and 9.3.5.3.2(e) delete Footnote "f":

~~ASTM A 106 Grade B or A 53 Grade B has an  $F_y = 35$  ksi. An  $F_y = 30$  ksi was used also as a conservative value to account for differences in material properties as well as other operational stresses.~~

Substantiation: There is no "f" designation in any of the 5 tables and Footnote "f" is not applicable to the new tables for CPVC or copper pipe since the references to ASTM A 106 and A 53 are for steel pipe. Further, much of the Schedule 5 and Schedule 10 pipe used in sprinkler systems is made to the ASTM A 135 and ASTM A 975 specifications, rather than to A 106 or A 53. Even for Schedule 40 pipe, it is common to use Grade A material with a  $F_y$  of 30 ksi, rather than the better Grade B, so even for steel piping, Footnote "f" is inaccurate, misleading and unnecessary.

13- Log #113 AUT-HBS  
(Table 9.3.5.3.2(d) and (e))

Final Action:

Submitter: Janak B. Patel, Bechtel Savannah River Company

Recommendation:

\*\*\*\*Insert Include 13\_L113\_R.doc Here\*\*\*\*

Substantiation: Reason: CPVC has no yield stress data, ASTM F441/442 that requires to use Burst Pressure limit = 2 ksi as design stress limit.

Reason:  $F_y = 32$  ksi for Type M Copper tube is applied erroneously in the current version of the Table. The correct  $F_y$  for Type M Copper tube is = 11 ksi per ASTM B88.

13- Log #404 AUT-HBS  
(9.3.5.3.5)

Final Action:

Submitter: William J. Dust, Code Consultants, Inc.

Recommendation: Revise text to read as follows:

The distance between the last brace and the end of the pipe or a change in direction shall not exceed 6 ft (1.8 m).

Substantiation: The current paragraph only identifies the end of a system main. The proposed change adds clarity to the intent of the standard and provides direction when a system main changes direction.

Table 9.3.5.3.2(d) Maximum Load (Fpw) in Zone of Influence (lb), (Fy = 2 ksi) CPVC Pipe

Pipe (in.)	Lateral Sway Brace Spacing (ft) <sup>a</sup>				
	20 Ft	25 Ft	30 Ft	35 Ft	40 Ft
3/4	4	3	2	2	2
1	7	6	5	4	3
1 1/4	14	11	9	8	7
1 1/2	21	17	14	12	10
2	41	32	27	23	19
2 1/2	72	57	47	40	34
3	129	104	85	73	61

<sup>a</sup> ASTM F441/442 Burst Pressure Limit = 2 ksi.

Reason: CPVC has no yield stress data, ASTM F441/442 that requires to use Burst Pressure limit = 2 ksi as design stress limit.

Table 9.3.5.3.2(e) Maximum Load (Fpw) in Zone of Influence (lb), (Fy = 11 ksi) Type M Copper Tube

Pipe (in.)	Lateral Sway Brace Spacing (ft) <sup>a</sup>				
	20 Ft	25 Ft	30 Ft	35 Ft	40 Ft
3/4	6	5	4	3	3
1	11	9	7	6	5
1 1/4	19	16	13	11	9
1 1/2	32	25	21	18	15
2	65	52	42	36	30

<sup>a</sup> ASTM B88 has and Fy = 11 ksi.

Reason: Fy = 32 ksi for Type M Copper tube is applied erroneously in the current version of the Table. The correct Fy for Type M Copper tube is = 11 ksi per ASTM B88.

13- Log #418 AUT-HBS  
(9.3.5.3.9)

Final Action:

Submitter: Randy R. Nelson, VFS Fire and Security Services

Recommendation: Revise text to read as follows:

The requirements of 9.3.5.3 shall not apply to pipes individually supported to the building structure by rods less than 6 in. (152 mm) long measured between the top of the pipe and the point of attachment to the building structure.

Substantiation: Some contractors are using this paragraph for trapeze hangers, claiming that the rod from the trapeze to the top of pipe is less than 6 in., therefore eliminating lateral bracing on those pipes. The revision clarifies that paragraph 9.3.5.3.9 applies to hangers starting at the building structure.

13- Log #132 AUT-HBS  
(9.3.5.3.10)

Final Action:

Submitter: Kraig Kirschner, AFCON

Recommendation: Revise text to read as follows:

Page 13-104 9.3.5.3 Lateral Sway Bracing

9.3.5.3.10 "...Table 9.3.5.8.7(b), ~~and~~ or Table 9.3.5.8.7(c) and fasteners as required by Section 9.3.5.9.

Substantiation: Fasteners should conform to sway brace criteria.

13- Log #405 AUT-HBS  
(9.3.5.4.3)

Final Action:

Submitter: William J. Dust, Code Consultants, Inc.

Recommendation: Revise text to read as follows:

The distance between the last brace and the end of the pipe or a change in direction shall not exceed 40 ft (12.2 m).

Substantiation: The current paragraph only identifies the end of a system main. The proposed change adds clarity to the intent of the standard and provides direction when a system main changes direction.

13- Log #133 AUT-HBS  
(9.3.5.5)

Final Action:

Submitter: Kraig Kirschner, AFCON

Recommendation: Revise text to read as follows:

Page 13-102 9.3.5.5 Risers.

9.3.5.5.1\* Tops ....provided with ~~a~~ four-way brace bracing.

9.3.5.5.2 "...~~brace bracing~~.... 9.3.5.5.3 .....~~a~~ .... brace bracing.... 9.3.5.5.4 ....~~braces bracing~~...".

Substantiation: Align text with Section 9.3.5.5.5.

Bracing denotes methodology and enhances clarity.

AHJ's often misconstrue four-way as a single assembly or product.

Standardize terminology.

13- Log #259 AUT-HBS  
(9.3.5.6.3)

Final Action:

Submitter: Thomas G. Wellen, American Fire Sprinkler Association, Inc.

Recommendation: Delete text to read as follows:

~~9.3.5.6.3\* Where the authority having jurisdiction does not specify the horizontal seismic load, the horizontal seismic force acting on the braces shall be determined as specified in 9.3.5.6.2 with  $C_p = 0.5$ .~~

Substantiation: Delete this section and renumber the remaining sections. First, AHJs do not specify horizontal seismic loads. This is calculated by the layout technician, designer, or PE. Secondly, there is sufficient information from the building codes or the online USGS to obtain the appropriate values. This section is incorrect and obsolete.

13- Log #205 AUT-HBS  
(9.3.5.6.4 and 9.3.5.6.4.1)

Final Action:

Submitter: John Deutsch, City of Brea Fire Department

Recommendation: Add new text as follows:

9.3.5.6.4\* The zone of influence for lateral braces shall include all branch lines and mains tributary to the brace, except branch lines that are provided with longitudinal bracing or as prohibited by Section 9.3.5.6.4.1.

9.3.5.6.4.1 When riser nipples exceed 4' in length and lines are 2½" or greater the longitudinal seismic force of the line shall not be tributary to lateral seismic load of the main. The longitudinal seismic load of each line shall be evaluated independently and lines shall be provided with longitudinal sway bracing as per Section 9.3.5.4.

Substantiation: In the occurrence of a seismic event which creates forces parallel with the lines and perpendicular with the main, the lateral sway brace on the main is expected to keep all of the line piping and main piping within the zone of influence in place with the roof structure. The connection between the riser nipple and the main is the only thing keeping the line from moving longitudinally. If a piping configuration has riser nipples excessively long, the longitudinal force from the lines can not be effectively transferred down through the riser nipple to the main and to the lateral brace on the main which may be as much as 20' away. This proposed code is to put a practical limit on how long a riser nipple can be before it becomes too long and can not effectively transfer forces to the main.

Note: Supporting material is available for review at NFPA Headquarters.

13- Log #134 AUT-HBS  
(9.3.5.7)

Final Action:

Submitter: Kraig Kirschner, AFCON

Recommendation: Revise text to read as follows:

Page 13-102 9.3.5.6\* Horizontal Seismic Loads

9.3.5.7 Net Vertical Reaction Forces. Where the horizontal seismic loads load used ~~exceed~~ exceeds 0.5 Wp and the brace angle is ~~less~~ greater than ~~45~~ 60 degrees from vertical or where the horizontal seismic load exceeds 1.0 Wp and the brace angle is ~~less~~ greater than ~~60~~ 45 degrees from vertical,..."

Substantiation: Revised text to enhance clarity.

A 45 degree brace angle provides superior resistance to vertical force than does a 60 degree brace angle.

Note: Supporting material is available for review at NFPA Headquarters.

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13- Log #147 AUT-HBS  
(Figure 9.3.5.9.1)

Final Action:

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Submitter: Kenneth W. Wagoner, Parsley Consulting Engineers

Recommendation: Replace "Length Under Head (in.)" with "Length In Timber (in.)" for lag screw/bolt length in Figure 9.3.5.9.1 table.

\*\*\*\*Insert 13\_Log #147\_Fig. 9.3.5.9.1 Here\*\*\*\*

**Substantiation:** Length of lag screw/bolt under head is potentially misleading, as width of timber may not be enough to allow for screw/bolt to be completely contained within the timber. This clarifies the intent, which is to have the threads of a lag screw/bolt completely engaged in the timber. Further, it makes the text more consistent with similar language used for "through bolts" in the same figure.

This is not original material; its reference/source is as follows:

Original graphic copied from current NFPA-13, proposed graphic modified to show example of wording.

---

13- Log #444 AUT-HBS  
(9.3.5.9.1.1)

Final Action:

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Submitter: Kenneth E. Isman, National Fire Sprinkler Association, Inc.

Recommendation: Add a new section 9.3.5.9.1.1 with an annex note and figure as follows:

9.3.5.9.1.1 Fasteners shall not be permitted be attached vertically into the bottom of structural members where the depth of the structural member exceeds the width and where the brace forms an angle of more than 30° with the length of the brace unless the fastener is listed for installation in this position.

A.9.3.5.9.1.1 See Figure A.9.3.5.9.1.1 for an example of an incorrect installation.

\*\*\*\*\*Insert Artwork Figure A.9.3.5.9.1.1 Here\*\*\*\*\*

**Substantiation:** A fastener in this location will create an overturning moment on the structural member. Thin structural members will not be able to withstand this load.

The annex information is intended to show in pictures what is prohibited by the body of the standard since the text can be confusing.

This proposal was developed by the NFSA Engineering and Standards Committee.

Existing figure 9.3.5.9.1 [partial]:

Lag Screws and Lag Bolts in Wood (Load Perpendicular to Grain — Holes Predrilled Using Good Practice)																															
Length under Head (in.)	Lag Bolt Diameter (in.)																														
	5/8										1/2										3/4										
	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I				
3 1/2	165	190	200	170	220	310	80	120	170	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4 1/2	180	200	200	175	235	350	80	120	170	300	355	380	315	400	550	145	230	325	—	—	—	—	—	—	—	—	—	—	—	—	
5 1/2	190	200	200	175	245	380	80	120	170	320	370	380	320	420	610	145	230	325	435	525	555	425	550	775	195	320	460	—	—	—	—
6 1/2	195	205	200	175	250	400	80	120	170	340	375	380	325	435	650	145	230	325	465	540	555	430	570	840	195	320	460	—	—	—	—

Note: Wood fastener maximum capacity values are based on 2001 National Design Specifications (NDS) for wood with a specific gravity of 0.35. Values for other types of wood can be obtained by multiplying the above values by the following factors:

Specific Gravity of Wood	Multiplier
0.36 thru 0.49	1.17
0.50 thru 0.65	1.25
0.66 thru 0.73	1.50

For SI values, 1 in. = 25.4 mm.

FIGURE 9.3.5.9.1 Maximum Loads for Various Types of Structures and Maximum Loads for Various Types of Fasteners to Structures.

Proposed revision to figure 9.3.5.9.1 [partial]:

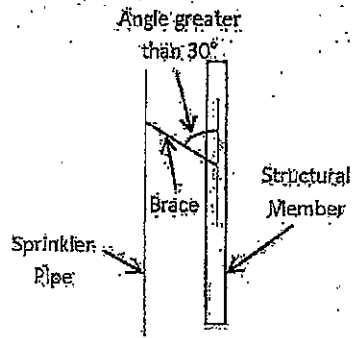
Lag Screws and Lag Bolts in Wood (Load Perpendicular to Grain — Holes Predrilled Using Good Practice)																															
Length in Timber (in.)	Lag Bolt Diameter (in.)																														
	5/8										1/2										3/4										
	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I				
3 1/2	165	190	200	170	220	310	80	120	170	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
4 1/2	180	200	200	175	235	350	80	120	170	300	355	380	315	400	550	145	230	325	—	—	—	—	—	—	—	—	—	—	—	—	
5 1/2	190	200	200	175	245	380	80	120	170	320	370	380	320	420	610	145	230	325	435	525	555	425	550	775	195	320	460	—	—	—	—
6 1/2	195	205	200	175	250	400	80	120	170	340	375	380	325	435	650	145	230	325	465	540	555	430	570	840	195	320	460	—	—	—	—

Note: Wood fastener maximum capacity values are based on 2001 National Design Specifications (NDS) for wood with a specific gravity of 0.35. Values for other types of wood can be obtained by multiplying the above values by the following factors:

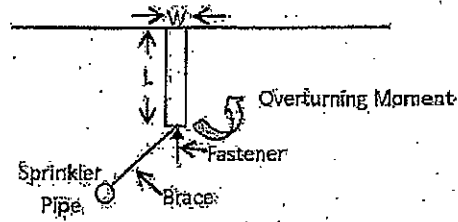
Specific Gravity of Wood	Multiplier
0.36 thru 0.49	1.17
0.50 thru 0.65	1.25
0.66 thru 0.73	1.50

For SI values, 1 in. = 25.4 mm.

FIGURE 9.3.5.9.1 Maximum Loads for Various Types of Structures and Maximum Loads for Various Types of Fasteners to Structures.



Plan View



Elevation View

Figure A.9.3.5.9.1.1 Brace Arrangement Not Allowed Where "L" Exceeds "W" Due to Creation of an Overturning Moment

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13- Log #135 AUT-HBS  
(9.3.5.10.1)

Final Action:

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Submitter: Kraig Kirschner, AFCON  
Recommendation: Page 13-103 9.3.5.10 Assemblies.  
9.3.5.10.1 Sway ~~bracing~~ brace ...".

Substantiation: Standardize terminology to enhance clarity.

---

13- Log #524 AUT-HBS  
(9.3.5.10.3)

Final Action:

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Submitter: Victoria B. Valentine, National Fire Sprinkler Association, Inc.  
Recommendation: Modify the section as follows:  
The loads shall be reduced as shown in Table 9.3.5.10.3 for ~~loads that are~~ installations where the brace is less than 90 degrees from vertical.  
Substantiation: This is strictly an editorial change as the paragraph refers to the installation angle for application of the values in the table.

---

13- Log #136 AUT-HBS  
(9.3.5.11.1)

Final Action:

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Submitter: Kraig Kirschner, AFCON  
Recommendation: Page 13-104 9.3.5.11 Attachments  
9.3.5.11.1 Bracing....directly attached to ~~feed and cross main,~~ the system pipe.

Substantiation: Bracing is not limited to FM and CM i.e. lines, pump house piping, etc. are appropriate.

---

13- Log #68 AUT-HBS  
(9.3.6.1(6) (New) )

Final Action:

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Submitter: Peter T. Schwab, Wayne Automatic Fire Sprinklers, Inc.  
Recommendation: Add new text to read as follows:  
(6) CPVC hangers utilizing two points of attachment.  
Substantiation: Cpvc hangers are very similar to U-hooks listed in Section 9.3.6.1(2). Listed CPVC hangers provide support and restraint to prevent sprinklers from moving above a ceiling during operation. This should be adequate for restraint of branch lines for seismic.

---

13- Log #41 AUT-HBS  
(9.3.6.3)

Final Action:

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Submitter: Bruce Kritz, S.C. State Fire Marshal's Office  
Recommendation: Add new text to read as follows:

\*\*\*Insert NFPA 13/Log #41/Table 9.3.6.3/ROP here\*\*\*  
Substantiation: The word "excessive" is subjective. It would be helpful to have a guideline for the minimum length of different size pipes that require restraint.

Table 9.3.6.3 Minimum Branchline Length Requiring Restraint

Nominal Pipe Size	Requires Restraint /A Longer Phan (FroIn)
1	4.0
1 1/2	5.0
1 1/2	6.0
2	7.0
2 1/2	8.0
3	9.0

---

13- Log #511 AUT-HBS  
(9.3.7.8 (New) and A.9.1.3)

Final Action:

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Submitter: John Silva, Hilti

Recommendation: Add new Section 9.3.7.8:

Concrete anchors used to secure hangers to the building structure shall be prequalified for seismic applications in accordance with ACI 355.2, Qualification of Post-Installed Mechanical Anchors in Concrete and Commentary, and installed in accordance with manufacturer's instructions.

Add new annex language to Section A.9.1.3:

In areas that are subject to provisions for earthquake protection of mechanical systems, the fasteners in concrete will need to be prequalified. See Section 9.3.7.8 for further information.

**Substantiation:** Similar language was added to the 2010 Edition of NFPA 13 for sway brace assemblies.

However, the connection for hangers in areas subject to earthquake forces is equally important.

Hangers must carry the vertical component resulting from nearby (angled) braces as well as vertical earthquake motions. Since failure of the hangers will result in loss of the system, the code should not permit a lower standard of quality and safety for the hanger anchorage if the building is subject to earthquake motions.

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13- Log #445 AUT-HBS  
(9.3.8)

Final Action:

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Submitter: Kenneth E. Isman, National Fire Sprinkler Association, Inc.

Recommendation: Add a new section 9.3.8 as follows:

9.3.8 Revamping of Systems. Where a system is being revamped and pipe is being inserted into outlets where sprinklers used to be installed, the requirements of 8.15.19.4.4 and 8.15.19.5.4 shall be followed.

**Substantiation:** Sections 8.15.19.4.4 and 8.15.19.5.4 deal with seismic issues and need to be cross referenced in the section of the standard dealing with earthquake protection. The committee on hanging and bracing should have some input on these sections and people reading the seismic protection rules should be aware that there are requirements in other parts of the standard that pertain to this subject.

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13- Log #230 AUT-HBS  
(9.11.1)

Final Action:

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Submitter: Larry W. Owen, Dooley Tackaberry, Inc.

Recommendation: Revise text to read as follows:

9.11.1 Unless the requirements of 9.1.1.2 are met, types of hangers shall be in accordance with the requirements of Section 9.1. When a water mist sprinkler system is installed, all hanging, bracing and restraint of system piping requirements shall be determined in accordance with NFPA 750 Standard on Water Mist Fire Protection Systems.

**Substantiation:** For installations of water mist systems in sprinkler applications, all installation requirements shall be determined by NFPA 750. This change is proposed for avoidance of confusion by AHJs in reviewing plans and installations for water mist.

13- Log #386 AUT-HBS  
(A.9.1.1.7)

Final Action:

Submitter: Joshua Elvove, U.S. General Services Administration  
Recommendation: Add new text to read as follows:

A.9.1.1.7 The rules covering the hanging of sprinkler piping take into consideration the weight of water-filled pipe plus a safety factor. No allowance has been made for the hanging of nonsystem components from sprinkler piping. NFPA 13 provides the option to support sprinkler piping from other sprinkler piping where the requirements of Section 9.1.1.2 are met. It is not the intent to prohibit materials that have no impact on the external load bearing capability of the sprinkler pipe such as decorations, unless these materials obstruct the sprinkler discharge.

Substantiation: Why does the standard need to be so stringent? This item is cited all too much by overzealous AHJs. By adding the new annex note, AHJs will at least understand that the intent of the base paragraph is only to prohibit hanging materials that impact on the external loading of the sprinkler pipe or interfere with sprinkler performance (discharge). The reality is: while some items attached to or hung from sprinkler pipe can clearly have an adverse impact on the sprinkler performance, other items such as paper decorations and similar objects hung from pipe will have no bearing on sprinkler performance whatsoever. Hence, this annex note is aimed to clarify this intent so AHJs have sufficient guidance to use professional judgment when they choose to cite this requirement.

13- Log #112 AUT-HBS  
(A.9.2.1.3)

Final Action:

Submitter: Janak B. Patel, Bechtel National Inc.  
Recommendation: A.9.2.1.3

~~The building structure is only required to handle .....loads are calculated and safety factors are applied.  
(delete the third paragraph)~~

~~In contrast, when sprinkler system ..... so NFPA 13 mandates a safety factor of 5 times the weight of the pipe.  
(delete the fifth paragraph)~~

Substantiation: To be consistent with the Hanger Performance (design load) criteria proposed in 9.1.1.2.

13- Log #18 AUT-HBS  
(A.9.3.1)

Final Action:

Submitter: Ellsa Guber, Simplex Grinnel  
Recommendation: Include Seismic Map.

Substantiation: Seismic Map is in NFPA 13, 2002 Edition, but is missing in NFPA 13, 2007 Edition.

13- Log #143 AUT-HBS  
(A.9.3.2.3(1))

Final Action:

Submitter: Kenneth W. Wagoner, Parsley Consulting Engineers  
Recommendation: Eliminate the section.

Substantiation: This information should be part of the standard, rather than the annex. See subsequent proposal for addition to 9.3.2.3.

13- Log #204 AUT-HBS  
(A.9.3.2.4)

Final Action:

Submitter: John Deutsch, City of Brea Fire Department

Recommendation: Revise text to read as follows:

A.9.3.2.4 See Figure A.9.3.2.4. Drops that extend into freestanding storage racks or other similar structures should be designed to accommodate a horizontal relative displacement between the storage rack and the overhead supply piping. The horizontal relative displacement should be determined using the following formula and shall be taken as the height of the top point of attachment to the storage rack above its base or the highest point of potential contact between the rack structure and the piping above its base, whichever is higher, multiplied by 0.05 unless a smaller value is justified by test data or analysis. The horizontal relative displacement should be accommodated by two or more flexible couplings, swing joints, or other approved means. It shall be the responsibility of the sprinkler designer to determine how to account for the determined differential movement using flexible couplings or other approved means.

\*\*\*Insert Equation #1 Here\*\*\*

Where:

D = Differential movement between the rack and the roof

H = Height of the top point of attachment to the rack

$S_1$  = Long period spectral acceleration.

**Substantiation:** All rack storage systems everywhere should not be subjected to the same worst case potential displacement just as NFPA 13 does not require the same  $C_p$  value for all brace load calculations for sprinkler systems everywhere. The proposal allows for smaller displacement values, but it does not provide any direction on how to determine this. The proposal suggests the use of flexible coupling to account for displacement; however, 5 percent rack displacement is well beyond the capabilities of 2 couplings. The proposal's reference to couplings is contradictory to the 5 percent. In most situations the potential rack displacement will be much less than 5 percent. The storage rack potential displacement should be determined using site specific information. This can be accomplished using the same USGS web page and as is currently being used to determine  $S_s$ .

The potential rack displacement is a function of the ASCE 7-05 variable  $S_1$  (rather than the  $S_s$  which is more appropriate for buildings) which is the mapped MCE spectral response acceleration at a period of 1 s as defined in Section 11.4.1 of ASCE 7-05. The use of the variable  $S_1$  to determine rack displacement would not require everyone to use a worst case scenario and therefore racks installed in areas which are not subject to potentially large seismic events will not be required to provide for the same potential displacement.

The assumption of 5 percent displacement is an extrapolation of known data to an extremely high seismic demand. It is not representative of typical seismicity, and applies only to small areas in the vicinity of major faults. Accordingly, it is an excessively high value neither supported by known science, nor published test results. Articles and test data results authored by Filiatrault, Higgins and others has been published in the ASCE Structural Practice Periodical Volume 11 issue 3 and Volume 12 issue 4 and Earthquake Spectra Volume 24 issue 3. The articles and test data support a maximum potential down aisle displacement of 3.5 to 4 percent, not 5 percent.

I suggest that the following formula be used to determine the potential rack displacement.

\*\*\*Insert Equation #2 Here\*\*\*

Where:

D = rack displacement

H = height of the top point of attachment to the rack

0.04 = 4 percent rack displacement

0.8 = is the design seismic event used for developing the shake table spectra in the cited references.

For areas with the most severe demands ( $S_1=1.0$ , which is an extraordinary value), this equation will yield the upper bound 5% drift value suggested, but will also provide more realistic values for all other sites.

$$D = H * 0.05 * S_1$$

$$D = H \frac{0.04 * S_1}{0.8} = H * 0.05 * S_1$$

This is not original material; its reference/source is as follows:  
Higgins and Associates.

---

13- Log #517 AUT-HBS  
(A.9.3.2(a), Detail A)

Final Action:

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Submitter: Victoria B. Valentine, National Fire Sprinkler Association, Inc.

Recommendation: Figure A.9.3.2(a) Detail A: delete the note "(Pipe must rotate within brace)" found near the top of the figure.

Substantiation: Section 9.3.5.8.1 states that the "sway bracing shall be tight". This would not allow for rotation.

Therefore, the text should be removed. If the intention of the note is to point out that the pipe should still be able to move with the flexible coupling at the top of the riser, then the text should be worded differently.

---

13- Log #522 AUT-HBS  
(A.9.3.4)

Final Action:

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Submitter: Victoria B. Valentine, National Fire Sprinkler Association, Inc.

Recommendation: Add a new sentence at the end of Section A.9.3.4 as follows:

In areas that use suspended ceilings and are subject to earthquake forces, a larger clearance is required around the sprinkler unless the suspended ceiling is rigidly braced as noted in ASTM E580, *Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions*.

Substantiation: This larger clearance has been required by ASCE7-05 and now ASCE7-10. However, the specific language on the clearance is not only found in the ASTM document, which is referenced by ASCE7-10. Since it is not as readily located, it should be added as annex language so that users know where the requirement is located for these types of installations.

---

13- Log #137 AUT-HBS  
(A.9.3.5)

Final Action:

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Submitter: Kraig Kirschner, AFCON

Recommendation: Page 13-306 A.9.3.5.8

Sway brace design and installation requires attention to detail. Proper design is critical to sway brace performance. Sway brace design parameters are dynamic and interdependent. Accordingly, force is influenced by geography, brace location is impacted by system design and brace geometry is relative to the building structure.

Proper sway brace installation will evidence good craftsmanship with correct perpendicular and parallel planes, adhere to fitting manufacturers protocol and include installation conforming to approved plans and drawings.

Substantiation: AHJ's continually request a QC statement for reference in this standard.

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13- Log #518 AUT-HBS  
(A.9.3.5.3.2)

Final Action:

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Submitter: Victoria B. Valentine, National Fire Sprinkler Association, Inc.

Recommendation: Modify Section A.9.3.5.3.2: The first sentence should read, "The sway brace spacings in Table 9.3.5.3.2(a) and through Table 9.3.5.3.2(b) were developed..." Then at the end of the second sentence add "... for Table 9.3.5.3.2(a) and Table 9.3.5.3.2(b).

Substantiation: In the 2010 edition three additional tables were added. This is an editorial change to address that there are now 5 tables for the different types of pipe.

---

13- Log #407 AUT-HBS  
(A.9.3.5.3.5)

Final Action:

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Submitter: William J. Dust, Code Consultants, Inc.

Recommendation: Add new text to read as follows:

Figure A.9.3.5.3.5(a) and Figure A.9.3.5.3.5(b) are examples of typical lateral bracing locations at a change in direction. This section is not intended to consider back-to-back elbows a change in direction provided the adjacent runs of pipe are parallel.

Substantiation: The proposed annex section and corresponding figures indicate current bracing requirements and add clarity to the intent of the standard by providing direction for locating bracing when a system main changes direction.

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13- Log #408 AUT-HBS  
(Figure A.9.3.5.3.5(a))

Final Action:

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Submitter: William J. Dust, Code Consultants, Inc.

Recommendation: See proposed Figure A.9.3.5.3.5(a) Typical Location of Bracing at a horizontal change in direction.

\*\*\*Insert Figure A.9.3.5.3.5(a) Here\*\*\*

Substantiation: The proposed figure indicates current bracing requirements and adds clarity to the intent of the standard by providing direction for locating bracing when a system main changes direction.

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13- Log #409 AUT-HBS  
(Figure A.9.3.5.3.5(b))

Final Action:

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Submitter: William J. Dust, Code Consultants, Inc.

Recommendation: See proposed Figure A.9.3.5.3.5(b) Typical Location of Bracing at a vertical change in direction.

\*\*\*Insert Figure A.9.3.5.3.5(b) Here\*\*\*

Substantiation: The proposed figure indicates current bracing requirements and adds clarity to the intent of the standard by providing direction for locating bracing when a system main changes direction.

---

13- Log #410 AUT-HBS  
(Figure A.9.3.5.4.3)

Final Action:

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Submitter: William J. Dust, Code Consultants, Inc.

Recommendation: Add new text to read as follows:

Figure A.9.3.5.4.3(a) and Figure A.9.3.5.4.3(b) are examples of typical longitudinal bracing locations at a change in direction. This section is not intended to consider back-to-back elbows a change in direction provided the adjacent runs of pipe are parallel.

Substantiation: The proposed annex section and corresponding figures indicate current bracing requirements and add clarity to the intent of the standard by providing direction for locating bracing when system piping changes direction.

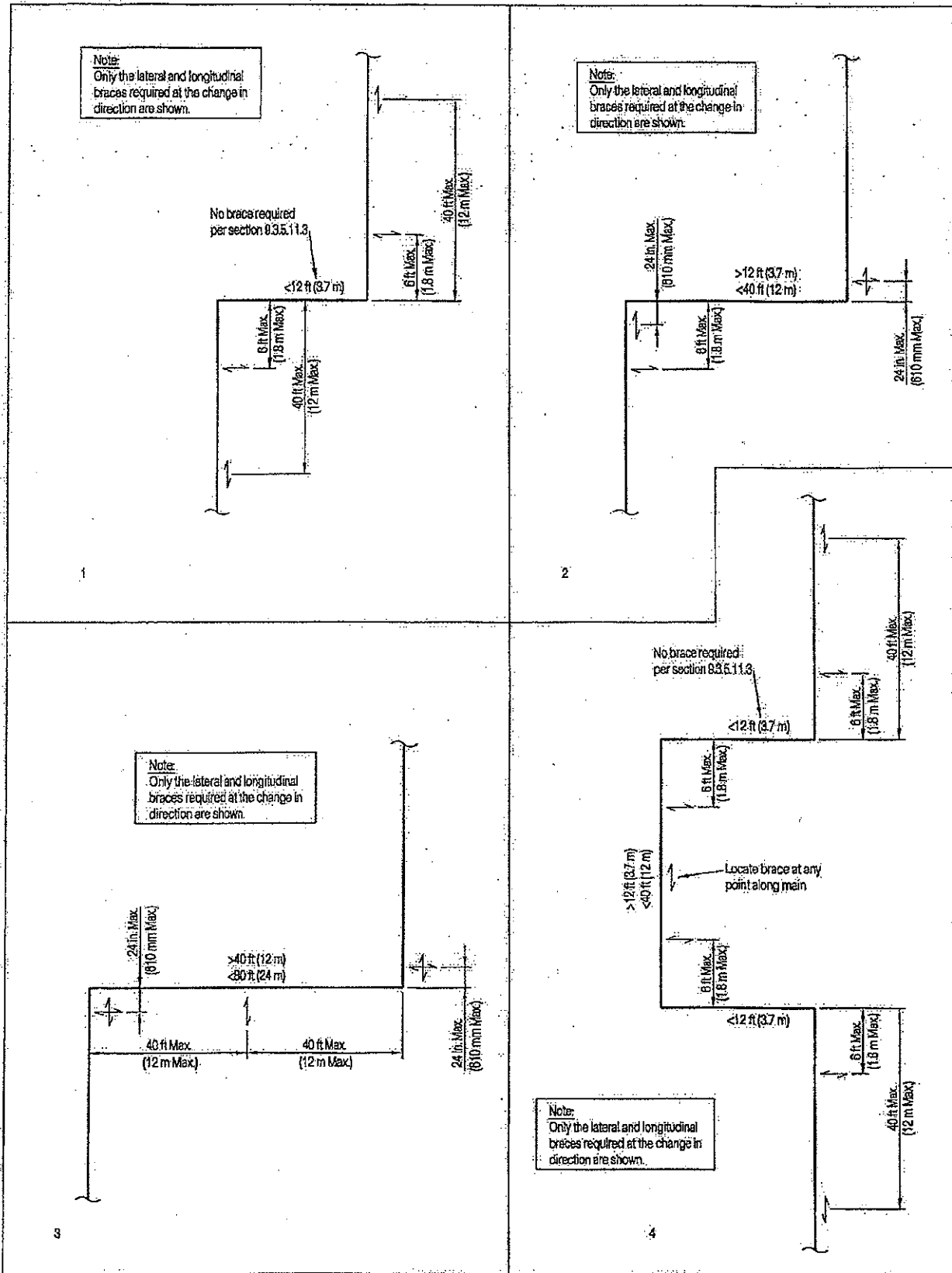
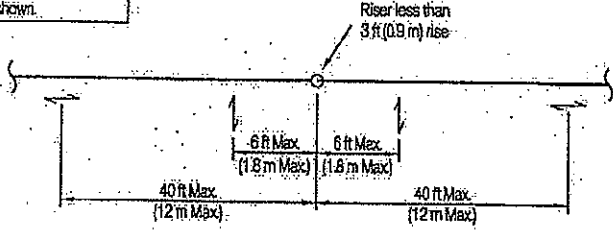
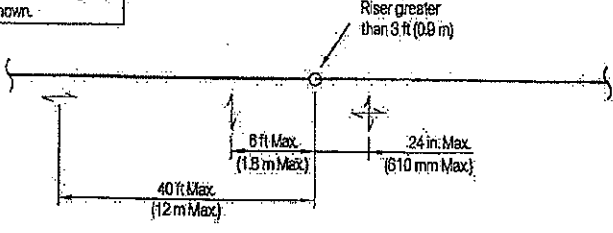


FIGURE A.9.3.5.3.5(a)/A9.3.5.4.3(a) Typical Location of Bracing at a horizontal change in direction.

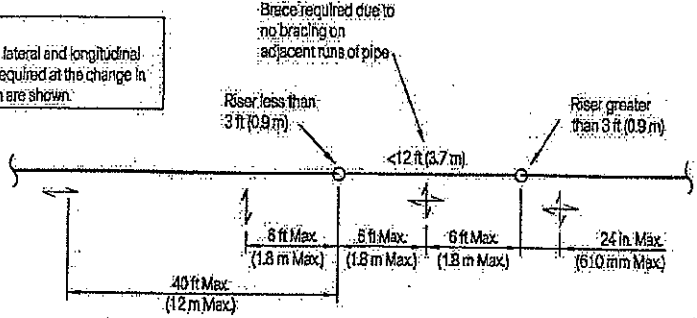
Note:  
Only the lateral and longitudinal braces required at the change in direction are shown.



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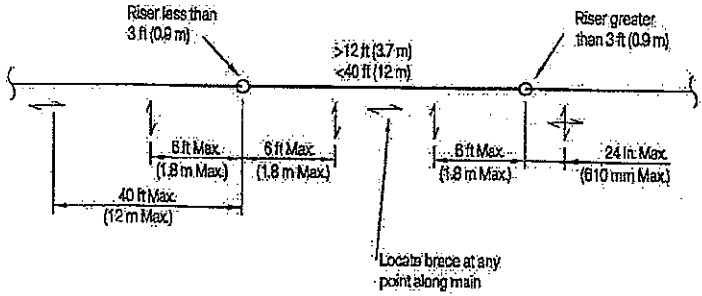


FIGURE A.9.3.5.3.5(b)/A.9.3.5.4.3(b) Typical Location of Bracing at a vertical change in direction.

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13- Log #411 AUT-HBS  
(Figure A.9.3.5.4.3(a))

Final Action:

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Submitter: William J. Dust, Code Consultants, Inc.

Recommendation: See proposed Figure A.9.3.5.4.3(a) Typical Location of Bracing at a horizontal change in direction.

\*\*\*Insert Figure A.9.3.5.4.3(a) Here\*\*\*

Substantiation: The proposed figure indicates current bracing requirements and adds clarity to the intent of the standard by providing direction for locating bracing when a system main changes direction.

---

13- Log #412 AUT-HBS  
(Figure A.9.3.5.4.3(b))

Final Action:

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Submitter: William J. Dust, Code Consultants, Inc.

Recommendation: See proposed Figure A.9.3.5.4.3(b) Typical Location of Bracing at a vertical change in direction.

\*\*\*Insert Figure A.9.3.5.4.3(b) Here\*\*\*

Substantiation: The proposed figure indicates current bracing requirements and adds clarity to the intent of the standard by providing direction for locating bracing when a system main changes direction.

---

13- Log #413 AUT-HBS  
(Figure A.9.3.5.5.1)

Final Action:

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Submitter: William J. Dust, Code Consultants, Inc.

Recommendation: Revise text to read as follows:

The four-way brace provided at the riser can also provide longitudinal and lateral bracing for adjacent mains. This section is not intended to require four-way bracing on a sprig or on a drop to a single sprinkler.

Substantiation: Section *9.3.5.5.1 Risers* acknowledges that by definition a "Sprig" is a riser and this annex section is provided to clarify that four-way bracing is not intended to be provided on vertical supply piping for individual sprinklers. Because a "Drop" can also be considered a riser this proposed change adds clarity to the intent of the standard.

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13- Log #414 AUT-HBS  
(A.9.3.5.6(b))

Final Action:

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Submitter: William J. Dust, Code Consultants, Inc.

Recommendation: See revised Figure A.9.3.5.6(b) Typical Location of Bracing on a Tree System.

\*\*\*Insert Figure A.9.3.5.6(b) Here\*\*\*

Substantiation: The proposed figures indicate current bracing requirements within the standard and add clarity to the intent of the standard by providing direction for locating bracing.

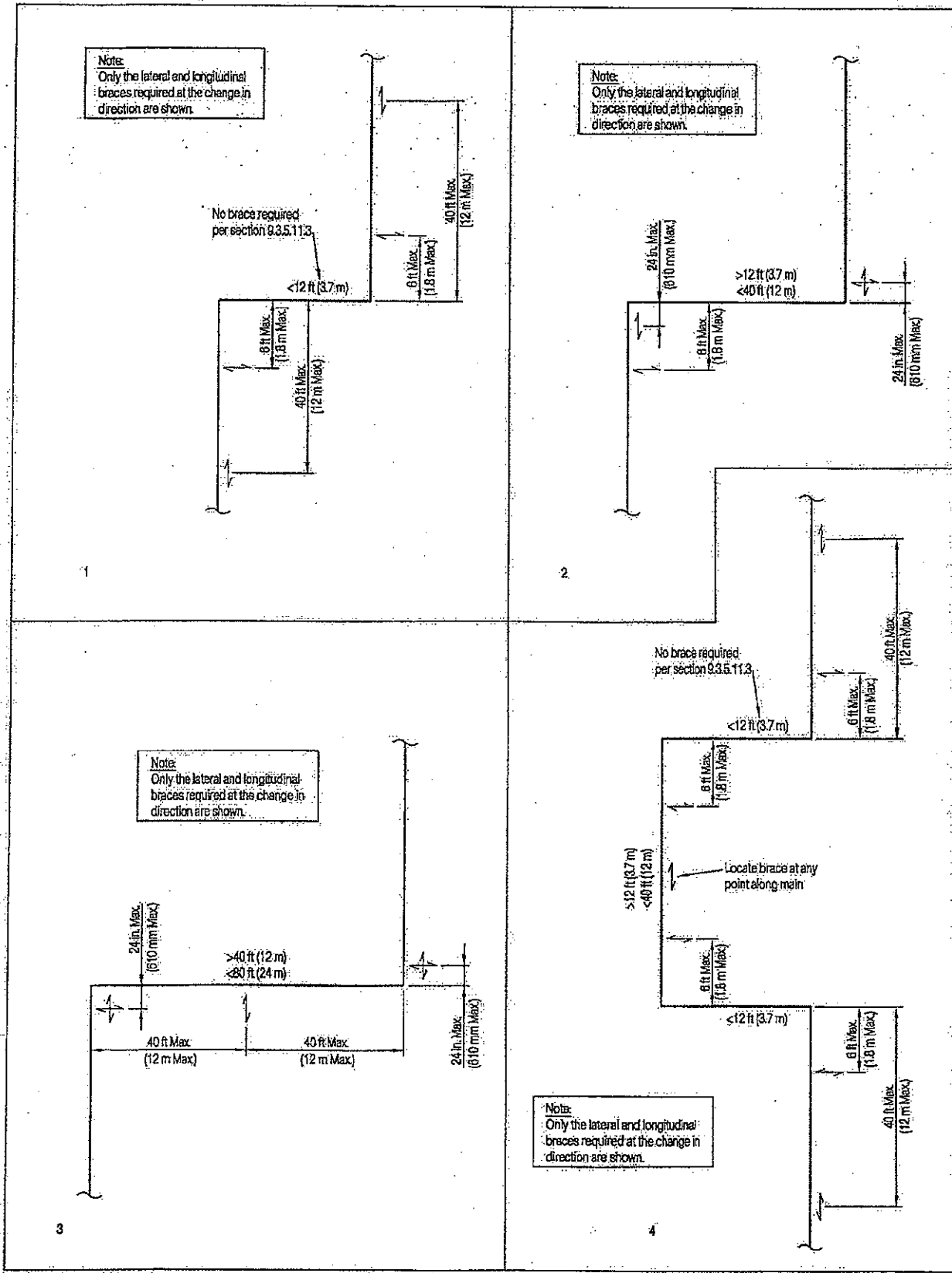


FIGURE A9.3.5.3(a)/A9.3.5.4.3(e) Typical Location of Bracing at a horizontal change in direction.

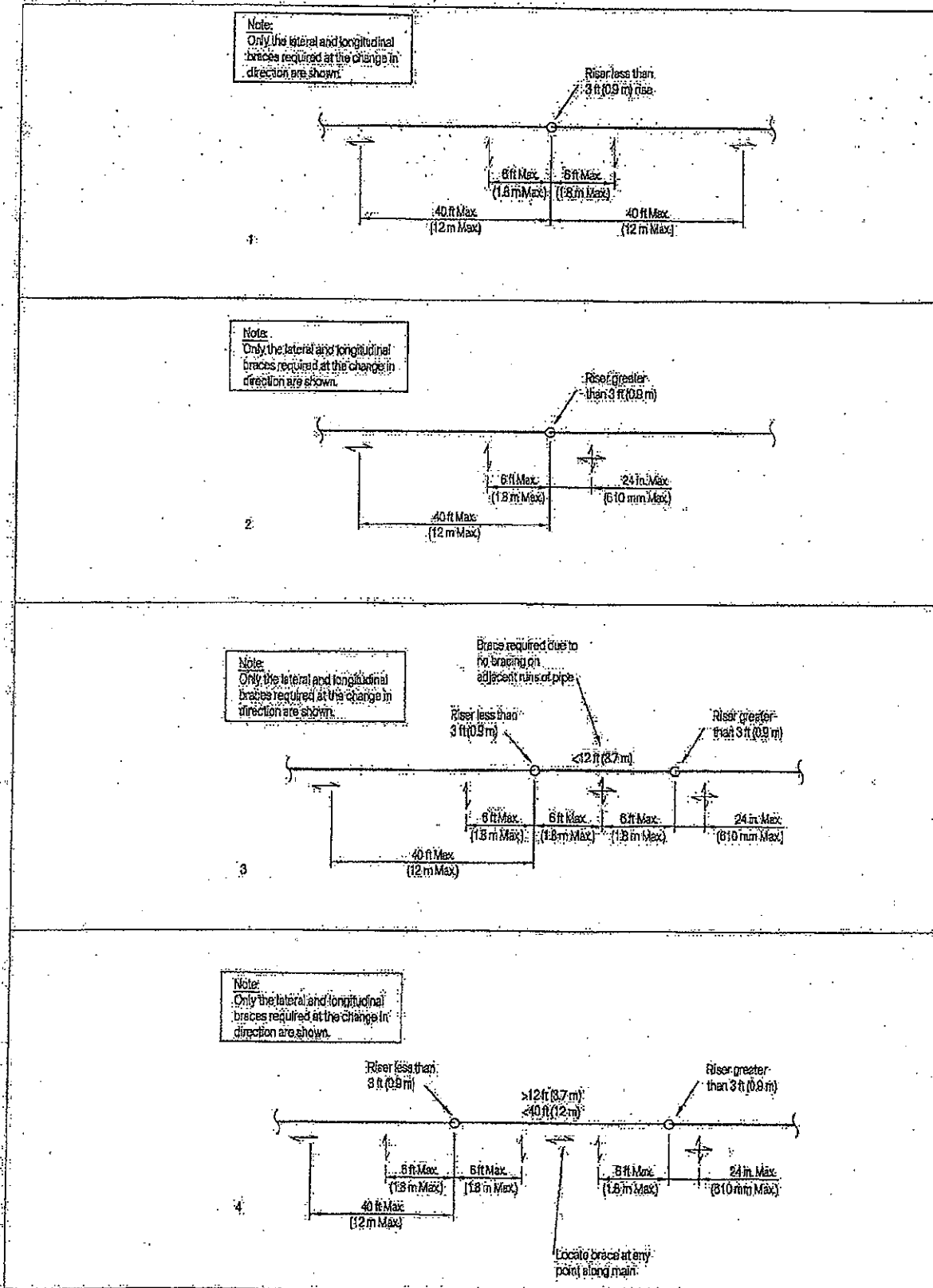
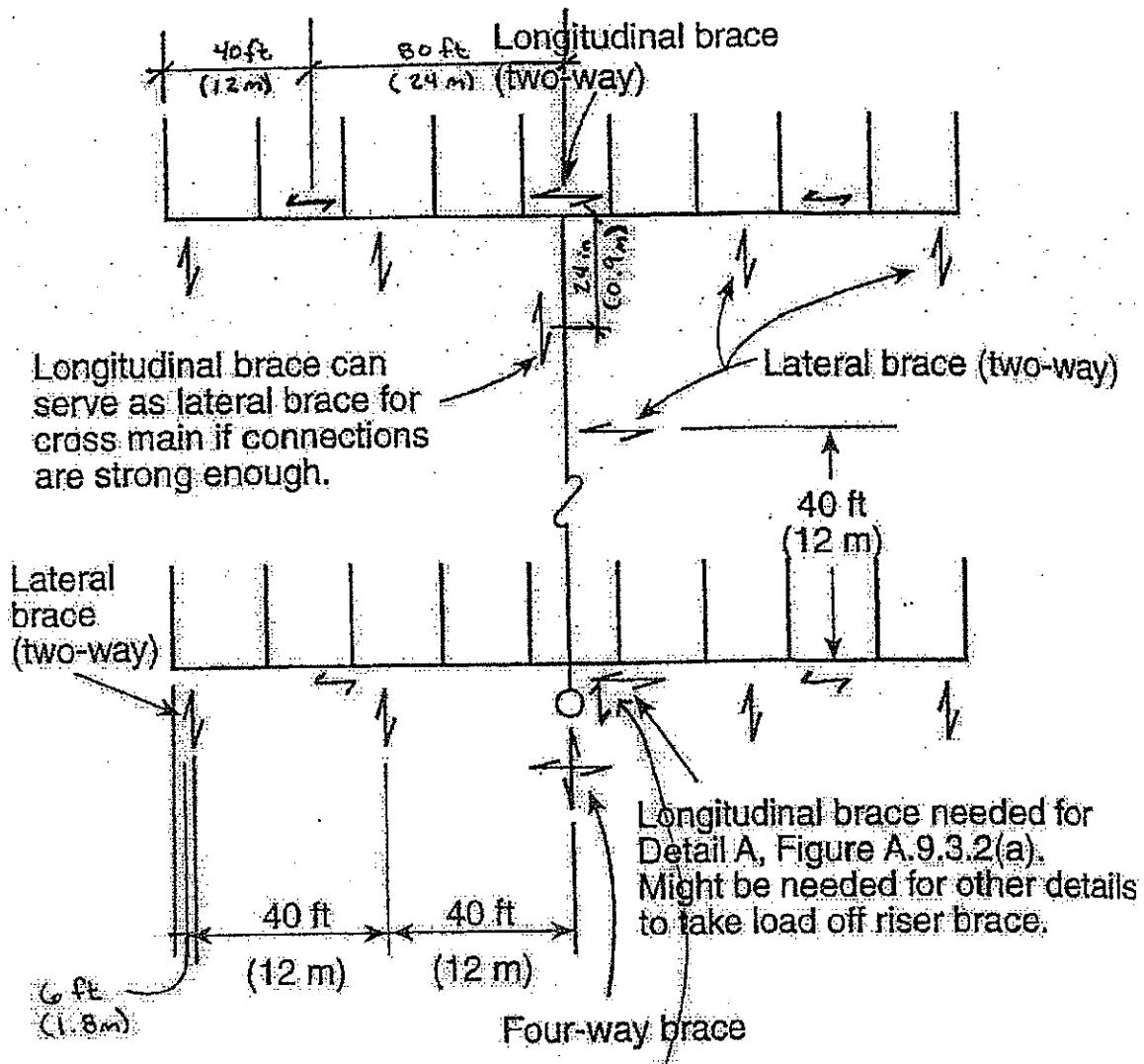


FIGURE A.9.3.5.4.3(c)/A.9.3.5.4.3(b) Typical Location of Bracing at a vertical change in direction.



**FIGURE A.9.3.5.6(b) Typical Location of Bracing on a Tree System.**

Bracing may be eliminated if four-way brace on riser is within 2 ft of cross main

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13- Log #415 AUT-HBS  
(A.9.3.5.6(c))

Final Action:

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Submitter: William J. Dust, Code Consultants, Inc.

Recommendation: See revised Figure A.9.3.5.6(c) Typical Location of Bracing on a Gridded System.

\*\*\*Insert Figure A.9.3.5.6(c) Here\*\*\*

Substantiation: The proposed figures indicate current bracing requirements within the standard and add clarity to the intent of the standard by providing direction for locating bracing.

---

13- Log #416 AUT-HBS  
(A.9.3.5.6(d))

Final Action:

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Submitter: William J. Dust, Code Consultants, Inc.

Recommendation: See revised Figure A.9.3.5.6(d) Typical Location of Bracing on a Looped System.

\*\*\*Insert Figure A.9.3.5.6(d) Here\*\*\*

Substantiation: The proposed figures indicate current bracing requirements within the standard and add clarity to the intent of the standard by providing direction for locating bracing.

---

13- Log #148 AUT-HBS  
(Figure A.9.3.5.6(d))

Final Action:

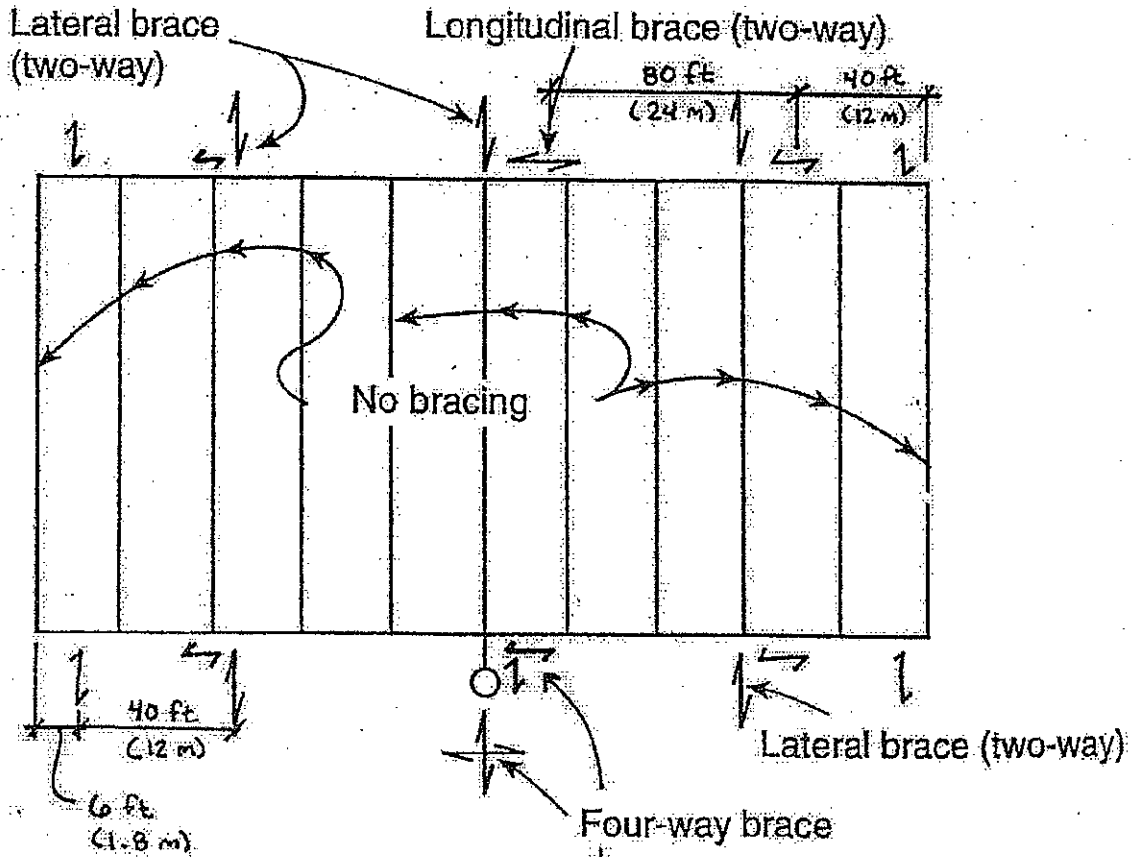
---

Submitter: Kenneth W. Wagoner, Parsley Consulting Engineers

Recommendation: Delete existing figure and insert revised:

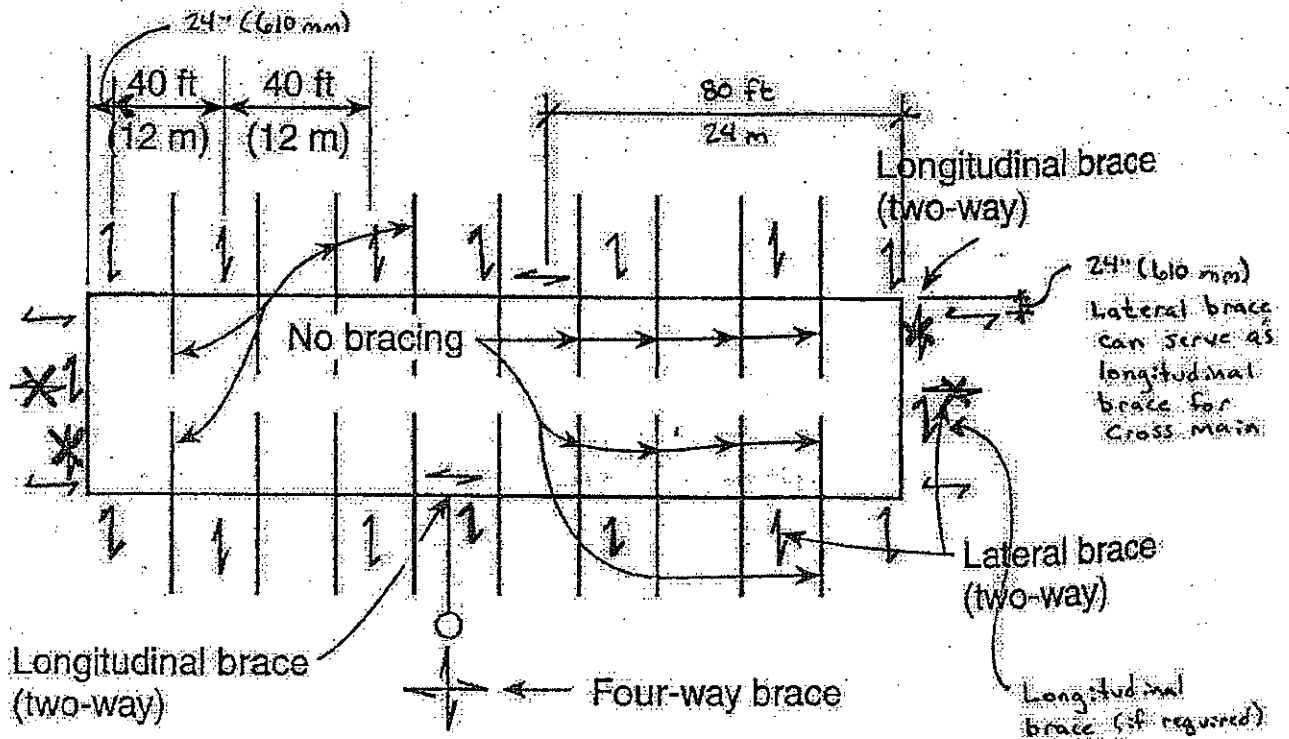
\*\*\*\*Insert 13\_L148\_Figure A.9.3.5.6(d)\_R Here\*\*\*\*

Substantiation: Existing figure suggests that last lateral brace on main may be spaced up to 40'-0" from the end of the main, which is contrary to 9.3.5.3.5, which limits this distance to maximum 6'-0". Further, the diagram did not address the possibility of a lateral brace functioning as a longitudinal brace for an adjacent main, provided the location was in accordance with 9.3.5.3.7. The revised figure provides clarification for both issues.



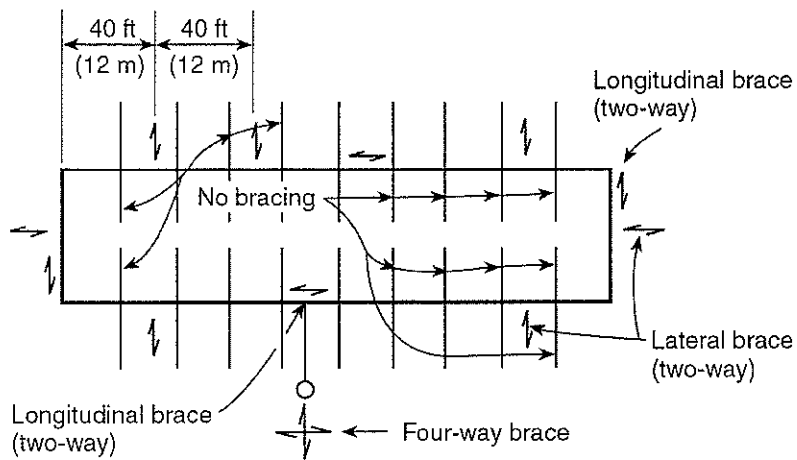
**FIGURE A.9.3.5.6(c) Typical Location of Bracing on a Grid System.**

Bracing may be eliminated if four-way brace on riser is within 2 ft of crossmain.



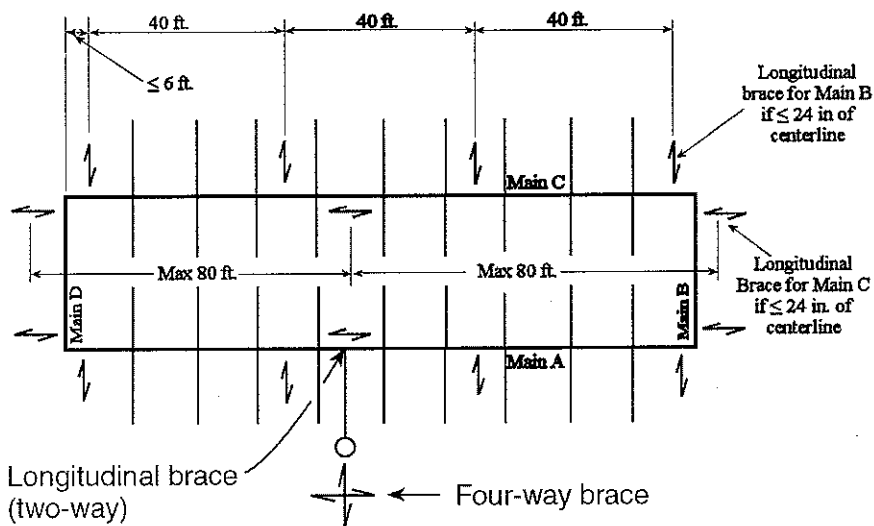
**FIGURE A.9.3.5.6(d) Typical Location of Bracing on a Looped System.**

Existing Figure A.9.3.5.6(d):



**FIGURE A.9.3.5.6(d) Typical Location of Bracing on a Looped System.**

Suggested Revised Figure A.9.3.5.6(d):



**FIGURE A.9.3.5.6(d) Typical Location of Bracing on a Looped System.**

---

13- Log #417 AUT-HBS  
(A.9.3.5.11.3)

Final Action:

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Submitter: Thomas G. Wellen, American Fire Sprinkler Association, Inc.

Recommendation: Revise text to read as follows:

9.3.5.11.3\* Pipe runs less than 12 ft (3.7 m) in length shall be permitted to be supported by the braces on adjacent runs of pipe.

Insert new figure in the annex:

\*\*\*\*Insert Figure A.9.3.5.11.3 Here\*\*\*\*

A.9.3.5.11.3 Examples of Brace Locations for Change in Direction of Pipe

Substantiation: A figure will clarify the application of braces when there is a change in direction of pipe less than and greater than 12 ft.

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13- Log #21 AUT-HBS  
(Figure A.9.3.5(a))

Final Action:

---

Submitter: David Mason, California Fire

Recommendation: Revise Figure as follows:

\*\*\*\*Insert 13\_L21\_Fig A.9.3.5(a)\_Exhibit #1 Here\*\*\*\*

See Exhibit #2

\*\*\*\*Insert 13\_L21\_Fig A.9.3.5(a)\_Exhibit #2 Here\*\*\*\*

Substantiation: None provided

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13- Log #406 AUT-HBS  
(Figure A.9.3.5(a))

Final Action:

---

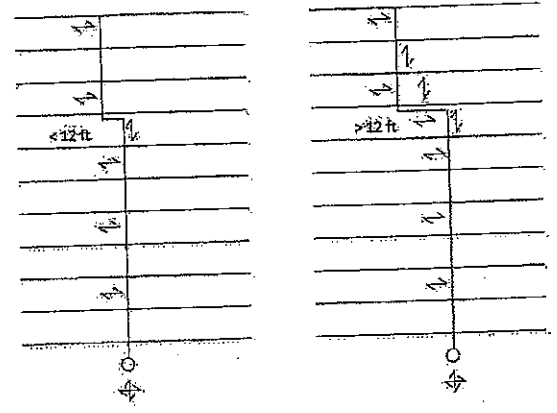
Submitter: William J. Dust, Code Consultants, Inc.

Recommendation: See proposed Seismic Bracing Calculation Form.

\*\*\*Insert Figure A.9.3.5(a) Here\*\*\*

Substantiation: The current figures do not correctly identify  $W_p$  and  $C_p$  which may cause the calculation for  $F_{pw}$  to be done incorrectly. Additionally the revised form has added locations for the  $S_x$  value and for a Sway Brace Attachment when the structural attachment is not directly connected to the Brace itself [e.g. when using a Tolco Fig. 825 bar joist attachment, an additional sway brace attachment (Tolco Fig. 908) is required]

A.9.3.5.11.3 Examples of Brace Locations for Change in Direction of Pipe



NFPA 13 (A12) ROP Log #417  
Figure A.9.3.5.11.3

EXHIBIT #1

Seismic Bracing Calculations					
Project: _____			Contractor: _____		
Address: _____			Address: _____		
			Telephone: _____		
			Fax: _____		
Brace Information			Seismic Brace Attachments		
Length of brace: _____	Diameter of brace: _____	Type of brace: _____	Structure attachment fitting or tension-only bracing system:		
Angle of brace: _____	Least radius of gyration:* _____	#r value:* _____	Make: _____ Model: _____		
Maximum horizontal load: _____			Listed load rating: _____ Adjusted load rating per 9.3.5.10.3: _____		
			Sway brace (pipe attachment) fitting:		
			Make: _____ Model: _____		
			Listed load rating: _____ Adjusted load rating per 9.3.5.10.3: _____		
Fastener Information			Seismic Brace Assembly Detail (Provide detail on plans)		
Orientation of connecting surface: _____			<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">                     Brace identification no. (to be used on plans)                 </div> <input type="checkbox"/> Lateral brace <input type="checkbox"/> Longitudinal brace		
Fastener:					
Type: _____					
Diameter: _____					
Length (in wood): _____					
Maximum load: _____					
Sprinkler System Load Calculation [ $F_{pw} = C_p W_p$ (default is 0.5)]					
Diameter	Type	Length (ft)	Total (ft)	Weight per ft	Total Weight
				lb/ft	lb
				lb/ft	lb
				lb/ft	lb
				lb/ft	lb
				lb/ft	lb
				Total weight	lb
				$W_p \times 1.15$	lb
* Excludes tension-only bracing systems					
© 2010 National Fire Protection Association					

FIGURE A.9.3.5(a) Seismic Bracing Calculation Form.

⚠ REVISION THIS

1 ADD THIS

EXHIBIT #2

2 REVISE TO THIS

# SEISMIC BRACING CALCULATIONS

SHEET \_\_\_\_ OF \_\_\_\_

PROJECT: \_\_\_\_\_

CONTRACTOR: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

Sr: \_\_\_\_\_ 1  
 Cpt: \_\_\_\_\_

TELEPHONE: \_\_\_\_\_

FAX: \_\_\_\_\_

## BRACE INFORMATION

## SEISMIC BRACE ATTACHMENTS

LENGTH OF BRACE: \_\_\_\_\_  
 DIAMETER OF BRACE: \_\_\_\_\_  
 TYPE OF BRACE: \_\_\_\_\_  
 ANGLE OF BRACE: \_\_\_\_\_  
 LEAST RADIUS OF GYRATION: \* \_\_\_\_\_  
 L/R VALUE: \* \_\_\_\_\_  
 MAXIMUM HORIZONTAL LOAD: \_\_\_\_\_

### STRUCTURE ATTACHMENT FITTING OR TENSION-ONLY BRACING SYSTEM:

MAKE: \_\_\_\_\_ MODEL: \_\_\_\_\_

LISTED LOAD RATING: \_\_\_\_\_ ADJUSTED LOAD RATING PER 6-4.5.7: \_\_\_\_\_

### SWAY BRACE (PIPE ATTACHMENT) FITTING:

MAKE: \_\_\_\_\_ MODEL: \_\_\_\_\_

LISTED LOAD RATING: \_\_\_\_\_ ADJUSTED LOAD RATING PER 6-4.5.7: \_\_\_\_\_

## FASTENER INFORMATION

## SEISMIC BRACE ASSEMBLY DETAIL

ORIENTATION OF CONNECTING SURFACE: \_\_\_\_\_

FASTENER:

TYPE: \_\_\_\_\_

DIAMETER: \_\_\_\_\_

LENGTH (IN WOOD): \_\_\_\_\_

MAXIMUM LOAD: \_\_\_\_\_

BRACE IDENTIFICATION NO.  
(TO BE USED ON PLANS)

LATERAL BRACE

LONGITUDINAL BRACE

## SPRINKLER SYSTEM LOAD CALCULATION [Fpw=CpWp]

DIAMETER	TYPE	LENGTH (FT)	TOTAL (FT)	WEIGHT PER FT	TOTAL WEIGHT	Wp=1.15XTOTAL WEIGHT
				LB/FT	LB	LB
				LB/FT	LB	LB
				LB/FT	LB	LB
				LB/FT	LB	LB
				LB/FT	LB	LB
					Total	LB
					Fpw=CpWp	LB

\* EXCLUDES TENSION-ONLY BRACING

SEISMIC BRACING CALCULATIONS - [ $S_s =$ ]				
PROJECT: _____		CONTRACTOR: _____		
ADDRESS: _____		ADDRESS: _____		
_____		TELEPHONE: _____		
_____		FAX: _____		
BRACE INFORMATION		SEISMIC BRACE ATTACHMENTS		
LENGTH OF BRACE: _____		STRUCTURE ATTACHMENT FITTING OR TENSION-ONLY BRACING SYSTEM:		
DIAMETER OF BRACE: _____		MAKE: _____	MODEL: _____	
TYPE OF BRACE: _____		LISTED LOAD RATING: _____ ADJUSTED LOAD RATING PER 9.3.5.10.3: _____		
ANGLE OF BRACE: _____		SWAY BRACE ATTACHMENT TO STRUCTURAL ATTACHMENT OR FASTENER:		
LEAST RADIUS OF GYRATION: _____		MAKE: _____	MODEL: _____	
L/R VALUE: _____		LISTED LOAD RATING: _____ ADJUSTED LOAD RATING PER 9.3.5.10.3: _____		
MAXIMUM HORIZONTAL LOAD: _____		SWAY BRACE (PIPE ATTACHMENT) RATING:		
		MAKE: _____	MODEL: _____	
		LISTED LOAD RATING: _____ ADJUSTED LOAD RATING PER 9.3.5.10.3: _____		
*EXCLUDES TENSION-ONLY BRACING SYSTEMS		<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">BRACING IDENTIFICATION NO. (TO BE USED ON PLANS): _____</div> <input type="checkbox"/> LATERAL BRACE <input type="checkbox"/> LONGITUDINAL BRACE		
FASTENER INFORMATION				
ORIENTATION OF CONNECTING SURFACE: _____				
FASTENER:				
TYPE: _____				
DIAMETER: _____				
LENGTH (IN WOOD): _____				
MAXIMUM LOAD: _____				
SPRINKLER SYSTEM LOAD CALCULATION $F_{pw} = W_p \times C_p [C_b = \text{PER TABLE 9.3.5.6.2}] =$ LB:				
DIAMETER	TYPE	TOTAL (FT)	WEIGHT PER FT	TOTAL WEIGHT
			LB/FT	LB
			LB/FT	LB
			LB/FT	LB
			TOTAL WEIGHT	LB
$W_p =$ TOTAL WEIGHT X 1.15				LB

FIGURE A.9.3.5(a) Seismic Bracing Calculation Form

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13- Log #521 AUT-HBS  
(A.9.3.5(a) and A.9.3.5(b))

Final Action:

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**Submitter:** Victoria B. Valentine, National Fire Sprinkler Association, Inc.

**Recommendation:** Modify the Seismic Bracing Calculation form to better address  $F_{pw}$ ,  $C_p$ , and  $W_p$  as used in the standard.

**Substantiation:** In recent editions of the standard  $F_{pw}$ ,  $C_p$ , and  $W_p$  have been modified. The forms need to be updated to ensure that they match the text in the body of the standard.