Hilton St. Louis at the Ballpark
St. Louis, MO
May 1st, 2013

Agenda

1. Call to order
2. Introduction and attendance, Interim Chair Rosenhan
3. Review and approval of minutes from previous meeting
4. NFPA Staff Liaison presentation, Chris Farrell
5. Reports
6. New business for 1931
   A. Review public inputs
   B. Discuss committee inputs
7. Revise references, 1931
8. New business for 1932
   A. Review public inputs
   B. Discuss committee inputs
9. Revise references, 1932
10. Other items
11. Next meeting
12. Adjourn
The meeting was called to order at 8:40 AM by Brian Berchtold, Committee Chair.

Welcome remarks made by Brian Berchtold, Chair.

Members made self introductions.

Members present

Brian Berchtold   Department of Navy
Phil Schwab       Duo-Safety Ladder
Steve Speer       Fire Service Safety Testing
Tom Hillenbrand   Underwriters Laboratories
Jim Johannessen   Underwriters Laboratories
Shawn Mizer       Aluminum Ladder Company
John Brown        North Carolina Fire Academy
Jim Glatts        Fire One
Larry Stewart     NFPA Staff

The committee was informed by sad news that Boyd Cole was not in attendance because of a serious illness and was unable to travel. The committee all gave their condolences and best wishes.

Minutes from the November 24, 2003 meeting in Northbrook, IL were approved.

The committee had a discussion about the new requirements in NFPA 1901 which is now allowing a substitution of multi-purpose ladders and step ladders in place of folding ladders. The committee felt that multi-purpose ladders were an acceptable substitution but did not feel that step ladders were a safe equivalent and the committee did not want to include testing of step ladders in NFPA 1931 and 1932. The consensus was that the committee would develop a request for a TIA on NFPA 1901 to strike step ladders from the document.
The committee took action on 3 public proposals it received for NFPA 1931 and generated a number of committee proposals that are being edited by Brian Berchtold.

The committee took action on 9 public proposals it received for NFPA 1932 and also generated a number of committee proposals that are being edited by Brian Berchtold.

There was no old business.

The committee discussed new business which included roof hook tests and rung bend tests. It was mentioned that some of the movement in the roof hook could be attributed to hardware slippage. With regard to the rung bend test, the committee did not want the test process for testing a ladder to become a labor consuming process. There was also discussion on determining excessive wear and to identify when too much worn ladder material constitutes an unsafe ladder and requiring testing.

The committee then decided to schedule their next ROC meeting in Indianapolis, IN in conjunction with FDIC on April 22, 2009.

The meeting was adjourned at 3:40 PM.

Prepared by Larry Stewart, Staff Liaison, NFPA
Public Input No. 1-NFPA 1931-2012 [ New Section after 4.1.3.3 ]

TITLE OF NEW CONTENT    Add to Chapter 5 Definitions-Double Ended Roof Ladder

Type your content here ...

A ladder of like construction as a roof ladder with the addition of hooks and butts at both ends.

Add to section 4.1.3 Ladder Construction after section 4.1.3.3

4.1.3.3.1 Double ended roof ladders will be excluded from this requirement as they have butts at both ends.

(See the article below on this for the reasoning behind it. Contact me at kertzie@gmail.com for full article with pictures and for additional pictures not used in the article and for any questions.)

Hooks at both ends of the ladder simplify roof operations
Story by Peter F. Kertzie Photos by Peter F. Kertzie / Dave Smith

It’s easy to become enamored with the newest, fanciest and most technologically advanced products that fire service manufacturers can come up with—especially those being pitched with the most “flash” or displayed with the help of a model in a bikini top and bunker pants. The excitement caused by some of these new and shiny products is certainly warranted. I remember the first time I held a Zippo lighter to Nomex; I was amazed when the cloth-like material didn’t ignite. What a breakthrough!

Once we return from vendor shows or fire conferences—and we’re removed from all the product pageantry—we can take the time to determine which products really have the potential to improve our operations without incurring a great cost to our department. I recently came across one such product: the double-ended roof ladder. That’s right—a ladder with hooks at both ends.

The Status Quo: 1 Set of Hooks

Most of the aerial apparatus here in Buffalo have a 20' roof ladder mounted to the top fly of our aerial ladders. The 20- footers are too long to fit inside our ground ladder storage area, so the fly of the aerial became their home out of necessity.

Accessing the roof from the aerial usually involves extending the aerial device to the peak and then throwing a roof ladder onto the roof with the hooks over the peak to hold it in place. We can then work off the roof ladder to vent the building. The 20' roof ladder is usually more than long enough to accommodate our needs.

Our aerial-mounted roof ladders are stored with their tips (and hooks) toward the tip of the aerial. If we need to ladder the roof on the same side as the aerial ladder, we simply open the hooks, lift the ladder off of the side and drop it into position while hooking it on the peak.

If we want to ladder the opposite side of the roof, then we have to spin the ladder around overhead to position the hooks on the opposite side of the ridge. If we’re working off an aerial platform, this job is awkward, but not terribly difficult because we’re standing on a flat surface and have the bucket’s railing to safely hold us in place. But if we’re working off a straight stick, things can be a bit more awkward. It’s hard to balance on the rungs of the aerial and simultaneously twirl the ladder around overhead.

When laddering a building at the peak, having the tip and hooks of the roof ladder aimed downward toward the lower end of the aerial ladder would allow us to deploy the roof ladder straight off the end of the aerial, as placing the hooks over the ridge would be the last step in the process. If the hooks are located at the tip of the aerial, you’ll have to do some maneuvering to get the ladder into the correct position.

Another scenario where a double-ended roof ladder would help: Sometimes a roof ladder is on one side of the ridge, and we need to move it to the other side. If the ladder had hooks on both ends, we could just guide the ladder over the top. The hooks at the bottom of the ladder on the original side of the ridge would become the hooks used to attach the ladder to the top of the ridge on the other side. But with hooks at one end only, we must spin the ladder around overhead to move it to the other side of the ridge.

I was discussing this maneuver with some friends from the Milwaukee Fire Department, and they showed me a method of hand placement they’re taught in rookie school specifically for spinning roof ladders overhead on the ridge of peaked roofs. While sitting, straddling the ridge, the truckie pulls the ladder up the side of the roof so it’s centered on the ridge. He then crosses his arms and grasps two rungs in the middle of the ladder. As he lifts the ladder, he should rotate his arms and spin the ladder’s tip to the opposite side.

This maneuver is a nice way to spin the ladder around overhead, and it works pretty well. But don’t forget that the ladder is still swinging around and could hit obstructions or other firefighters working in the immediate area, so be careful.
Looking for a Solution

After awkwardly rotating a roof ladder around over my head one day, it became apparent that if hooks were at both ends, this entire process could be eliminated. So I approached our “Carpenter Shop” (which is responsible for testing and maintaining our ground ladders) about the viability of adding hooks to the butt end of one of our roof ladders.

We discussed the facts: A straight ladder is constructed in the same manner as a roof ladder, and a straight ladder is exactly the same forward or backward, except that it has two butts attached to one end and two rounded caps attached to the other end. You could easily remove the caps and butts and reattach them to the opposite ends of the ladder—it would still be the same ladder. So why can’t we attach hooks to both ends? It would be like “Push-Me-Pull-Me” from the movie “Dr. Doolittle”—functional on both ends.

Our carpenter shop agreed to attach the hooks on the other end—simple and quick and we were on our way. The ladder was put back in its nesting place on our aerial ladder. All platoons were briefed on the alteration and agreed that it was a big improvement.

For a couple years we went about our business using the double-ended roof ladder. In my travels and conversations with other firefighters, I told them about having hooks at both ends. Every single one of them showed interest in the hooks or indicated that they wanted a ladder like this.

Getting Compliance

I contacted a couple ladder manufacturers to determine if we could purchase a ladder with hooks at both ends. Duo-Safety Ladder told me that they’ve made a couple ladders like this as a special order for some departments. I got the impression from them, however, that having hooks and butts at both ends didn’t exactly follow with the wording in the NFPA description of an approved ground ladder. It’s not that the ladders are now unsafe; rather, the wording in the standard describes tips and butts, and a double-ended ladder would only have butts.

It seemed to me that they thought that ladders of this type wouldn’t meet NFPA guidelines, as the NFPA alludes to compliant roof ladders having both a tip and a butt. I’m guessing some interpreted that to mean that the tip and the butt had to be constructed differently. In my opinion, the double-ended roof ladder was not addressed in the standard because the concept had not been brought up yet. As a member of the NFPA Ground Ladder Committee, I plan to submit the double-ended roof ladder concept for inclusion in the next update of the standard.

Naysayers may argue that without a tip with rounded ends, the butts could snag or get jammed up into roofing materials. Understandable. I could see this happening, but only if you failed to open your roof hooks. Hooks in their opened position will allow the roof ladder to roll nicely over any roofing material. The only time the hooks would not help by rolling over roofing material would be if you were sliding the roof ladder up at a right angle to the roof on one of its beams. In this case, rounded caps on the end wouldn’t be of any help anyway, as they are as flat as the beam when the ladder is on its side.

When I was in rookie school we were required to push the roof ladder up a peaked roof on its side. I think this was the “official” way fire departments were supposed to teach this task—a task probably developed by someone who never had to actually do this or any related job (such as roofer, carpenter or chimney sweep) on a regular basis because it certainly was not the most efficient method. The tip would often catch on the bottom edges of the shingles or the tip would venture off in odd directions as I pushed.

Once I was working on a truck and pushing roof ladders up on a regular basis, I found that the roof ladder would topple over from the side, and I would end up pushing the ladder up with the upper tip resting on the hooks of the ladder. As it turned out, this was easier than fighting with the edge of the shingles and required less energy, which I am all about. After playing with this for a while, I found that if I was pushing the ladder up with my right arm, I would aim the tip to the left of my target slightly and the tip would end up just where I wanted it at the peak. The same happened when I would do the opposite with my left arm.

Anyway, not having the little rounded tips turned out to be a non-issue, and the absence of them does not impede our work. NFPA 1931 4.1.33 gives a description of the ladder tip as rounded. In my personal interpretation, once I open the hooks, the tip is rounded.

Finally, the Product I Want

Every once in while, I would inquire with the ladder manufacturers about the availability of a double-ended ladder constructed to comply with NFPA specifications. I usually expected to hear that it was not available.

That was until one fateful day in the spring of 2008. I ran into a rep from Duo-Safety.

Ladder who told me that the double-ended ladder was now available and that its general construction is NFPA-compliant. A question over section 4.1.3.3 of NFPA 1931 requiring rounded tips applying to the double-ended ladder still loomed, so Duo-Safety labeled these ladders with a small sticker stating that these ladders were a special size and “not a standard model.”

A couple months ago, the East Amherst Fire Department in suburban Buffalo needed a roof ladder, and I suggested the double-ended version. They ordered one, and when it was delivered I met the truck at the firehouse to unload it. I used a Halligan (of course) to rip open the wood and cardboard crate. My eyes grew large as I pried chunks of wood away from it. I think it sparkled under the apparatus floor lighting.

At what cost does this innovation strike our tight budgets? It’s amazingly reasonable for something that will enhance our everyday operations, takes no extra space, requires little or no training and, most importantly, improves safety. The additional cost to a roof ladder is around $100.

Note: Ground ladder manufacturers do not condone end users altering ladders.

Final Thoughts
At a recent truck operations class I taught at a fire department conference, I asked for a show of hands from those attendees who had a wall or straight ladder. Not one hand went up. We simply don’t purchase these anymore. No more one-piece hookless ladders. We’ve evolved. We now purchase roof ladders. Fortunately, someone realized the senselessness of purchasing a 20’ straight ladder when you could purchase a 20’ roof ladder. Why not just order them as roof ladders? They do the same job and more and the cost is not that much more. The purpose of this column is to move us forward to a day when all roof ladders will be double-ended. Future generations will wonder how we ever got by with hooks at one end.

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It Takes 2 …

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Story by Peter F. Kertzie
Photos by Peter F. Kertzie / Dave Smith

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4.1.4.3
All metal ground ladders shall bear the electrical hazard warning label that is shown in Figure 4.1.4.3 on the outside of each beam between 1.37 m and 1.83 m (4 1/2 ft and 6 ft) from the butt. Labels shall be weather resistant.

Figure 4.1.4.3 Electrical Hazard Warning Label for Metal Ground Ladders.

Statement of Problem and Substantiation for Public Input

This requirement replaces Chapter 6, Label Tests

Submitter Information Verification

Submitter Full Name: JAMES GLATTS
Organization: FIRE ONE
Submittal Date: Tue Dec 18 08:56:52 EST 2012
Copyright Assignment

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4.1.4.4

All fiberglass and wood ground ladders shall bear the electrical hazard warning label that is shown in Figure 4.1.4.4 on the outside of each beam between 1.37 m and 1.83 m (4 1/2 ft and 6 ft) from the butt. Labels shall be weather resistant.

Figure 4.1.4.4 Electrical Hazard Warning Label for Fiberglass and Wood Ground Ladders.

Statement of Problem and Substantiation for Public Input

This sentence replaces Chapter 6, Label tests

Submitter Information Verification

Submitter Full Name: JAMES GLATTS
Organization: FIRE ONE
Submittal Date: Tue Dec 18 09:00:26 EST 2012

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4.1.4.5
All ground ladders shall bear the ladder positioning label that is shown in Figure 4.1.4.5 between 1.37 m and 1.83 m (4 1/2 ft and 6 ft) from the butt on the outside of both beams. Single ladders that are designed to be asymmetrical shall be permitted to have the label without the word “out” and the directional arrow. Labels shall be weather resistant.

Figure 4.1.4.5 Ladder Positioning Label.
Statement of Problem and Substantiation for Public Input

This sentence replaces Chapter 6, Label Tests

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Organization: FIRE ONE
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4.1.5.1 All metal and fiberglass ground ladders shall bear weather resistant heat sensors that are preset for 149°C (300°F)± 5 percent.

Statement of Problem and Substantiation for Public Input

This verbage replaces Chapter 6, Label Tests

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Organization: FIRE ONE
Submittal Date: Tue Dec 18 09:07:50 EST 2012

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Chapter 6: Label Tests

6.1 Labels to Be Tested
All labels required for ground ladders in 4.1.4.3, 4.1.4.4, 4.1.4.5, 4.1.5, 4.4.7.5, and 4.8.2 shall meet the requirements of this chapter.

6.2 Performance Requirements

6.2.1 Legibility
When tested as specified in 6.3.2, the labels shall retain their original color, readability, and clarity without any darkening, fogging, or blistering.

6.2.2 Adhesion
When tested as specified in 6.3.3.1, the labels shall have an average adhesion of not less than 0.35 N per linear millimeter (2 lbf per linear inch) of label width, and not less than 50 percent of the average adhesion measured for 6.3.3.1 when tested as specified in 6.3.3.2.

6.3 Testing

6.3.1 Preconditioning

6.3.1.1 The sample labels shall be applied to a surface material of the same type to which the label will be affixed, and this shall constitute a test sample. The test sample shall be exposed for 72 hours at 23°C ± 1°C (73°F ± 2°F) and 50 ± 2 percent relative humidity.

6.3.1.2 The sample labels shall be applied to a surface material of the same type to which the label will be affixed, and this shall constitute the test sample.

6.3.1.2.1 The test sample shall be exposed for 72 hours to a temperature of 23°C ± 1°C (73°F ± 2°F) and a relative humidity of 50 ± 2 percent.

6.3.1.2.2 The test sample shall then be exposed for 24 hours to a temperature of -40°C (-40°F).

6.3.1.3 The sample labels shall be applied to a surface material of the same type to which the label will be affixed, and this shall constitute the test sample.

6.3.1.3.1 The test sample shall be exposed for 72 hours to a temperature of 23°C ± 1°C (73°F ± 2°F) and a relative humidity of 50 ± 2 percent.

6.3.1.3.2 The test sample shall then be exposed for 6 weeks to a temperature of 60°C ± 2°C (140°F ± 4°F) and a relative humidity of 97 ± 3 percent.

6.3.1.4 The sample labels shall be applied to a surface material of the same type to which the label will be affixed, and this shall constitute the test sample.

6.3.1.4.1 The test sample shall be exposed for 72 hours to a temperature of 23°C ± 1°C (73°F ± 2°F) and a relative humidity of 50 ± 2 percent.

6.3.1.4.2
The test sample shall then be exposed for 90 days of aging at 87°C ± 1°C (190°F ± 2°F) in a mechanical convection air oven.

6.3.1.5—
The sample labels shall be applied to a surface material of the same type to which the label will be affixed, and this shall constitute a test sample.

6.3.1.5.1—
The test sample shall be exposed for 72 hours to a temperature of 23°C ± 1°C (73°F ± 2°F) and a relative humidity of 50 ± 2 percent.

6.3.1.5.2—
The test sample shall then be exposed for 720 hours to ultraviolet light and water.

6.3.1.5.2.1—
The ultraviolet light shall be obtained from two stationary, enclosed carbon-arc lamps.

(A)—
The arc of each lamp shall be formed between two vertical carbon electrodes, 12.7 mm ( ¼ in.) in diameter, located at the center of a revolvable, vertical metal cylinder, 787 mm (31 in.) in diameter and 450.9 mm (17 ¾ in.) in height.

(B)—
Each arc shall be enclosed with a No. 9200-PX clear Pyrex ™ glass globe.

(C)—
The samples shall be mounted vertically on the inside of the revolvable cylinder, facing the lamps, and the cylinder shall continuously revolve around the stationary lamps at 1 rpm.

6.3.1.5.2.2—
A system of nozzles shall be provided so that each sample, in turn, is sprayed with water as the cylinder revolves.

6.3.1.5.2.3—
During each 20-minute operating cycle, each sample shall be exposed to the light and water spray for 3 minutes and to the light only for 17 minutes.

6.3.1.5.2.4—
The air temperature within the revolving cylinder of the apparatus during its operation shall be 63°C ± 5°C (145°F ± 9°F).

6.3.1.6—
The sample labels shall be applied to a surface material of the same type to which the label will be affixed, and this shall constitute the test sample.

6.3.1.6.1—
The test sample shall be exposed for 72 hours to a temperature of 23°C ± 1°C (73°F ± 2°F) and a relative humidity of 50 ± 2 percent.

6.3.1.6.2—
The test sample shall then be exposed for 240 hours in a salt spray test as specified by ASTM B 117, *Standard Practice for Operating Salt Spray (Fog) Apparatus*.

6.3.1.7—
The sample labels shall be applied to a surface material of the same type to which the label will be affixed, and this shall constitute the test sample.

6.3.1.7.1—
The test sample shall be exposed for 72 hours to a temperature of 23°C ± 1°C (73°F ± 2°F) and a relative humidity of 50 ± 2 percent.

6.3.1.7.2—
The test sample shall then be exposed for 48 hours of immersion in distilled water.

6.3.1.8
The sample labels shall be applied to a surface material of the same type to which the label will be affixed, and this shall constitute the test sample.

6.3.1.8.1
The test sample shall be exposed for 72 hours to a temperature of 23°C ± 1°C (73°F ± 2°F) and a relative humidity of 50 ± 2 percent.

6.3.1.8.2
Following the exposure required in 6.3.1.8.1, the test sample shall be exposed for 10 days of aging at 180°C (356°F) in a mechanical convection air oven.

6.3.2 Legibility Test.

6.3.2.1
Test samples shall be prepared as required by and exposed to the preconditions specified in 6.3.1.1, after which the label shall be examined to determine color, readability, and clarity.

6.3.2.2
Test samples shall then be prepared as required by and exposed to each precondition as specified in 6.3.1.2 through 6.3.1.8.

6.3.2.3
After exposure to each precondition, the label shall be compared to the label that was preconditioned as specified in 6.3.1.1 to determine its compliance with 6.2.1.

6.3.3 Adhesion Test.

6.3.3.1
Two test samples shall be prepared as required by and exposed to the preconditions as specified in 6.3.1.1, after which the samples shall be tested as specified in 6.3.3.3 to determine the average adhesion.

6.3.3.2
Test samples then shall be prepared as required by and exposed to each precondition as specified in 6.3.1.2 through 6.3.1.8 and tested as specified in 6.3.3.3.

6.3.3.3
Labels shall be pulled from the surface material at an angle of 90 degrees to the surface, at a constant speed of 25.4 mm (1.0 in.) per minute.

6.3.3.3.1
The force to remove the label shall be recorded automatically on a chart, and the average force calculated in N per linear millimeter (lbf per linear inch) of label width.

6.3.3.3.2
Test results shall be obtained from two test samples to comprise an average for each precondition.

6.3.3.3.3
Test results obtained from samples specified in 6.3.3.2 shall be compared to the test results obtained from samples specified in 6.3.1.1 to determine compliance with 6.2.2.

Statement of Problem and Substantiation for Public Input

The label tests are outdated. The intent of the standard is to have weather resistant labels. New and current label products meet this intent without special tests. See new verbage added to Chapter 4.
Submitter Information Verification

Submitter Full Name: JAMES GLATTS
Organization: FIRE ONE
Submittal Date: Tue Dec 18 08:44:43 EST 2012

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B.1.1  NFPA Publications.
National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.


NFPA 1901, Standard for Automotive Fire Apparatus, 2009 Edition

Statement of Problem and Substantiation for Public Input

NFPA 1901 specifies that new apparatus have ground ladders meeting 1931. This informational reference reinforces the need for new ladders on new fire apparatus.

Submitter Information Verification

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Organization: FIRE ONE
Submittal Date: Tue Dec 18 09:12:26 EST 2012

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Public Input No. 4-NFPA 1932-2013 [ Section No. 6.1.3 [Excluding any Sub-Sections] ]

A visual inspection shall include, but not be limited to, the following:

1. Heat sensor labels on metal and fiberglass ladders, and on wood ladders if provided, for a change indicating heat exposure
2. All rungs, for snugness and tightness
3. All bolts and rivets, for tightness; bolts on wood ladders, for snugness and tightness without crushing the wood
4. Welds, for any cracks or apparent defects
5. Beams and rungs, for cracks, splintering, breaks, gouges, checks, wavy conditions, or deformation
6. Butt spurs, for excessive wear or other defects
7. Halyards, for fraying or kinking and minimum 3/8 inch diameter rope
8. Roof hooks, for sharpness, and 3/4 inch steel hooks and proper operation
9. Rungs, for punctures, wavy conditions, worn serrations in the foot contact areas, serrations worn down to base metal in any location, or deformation
10. Loss of base material due to corrosion
11. Ladder slide areas, for galling or absence of wax, if required by the manufacturer
12. Loss of gloss on fiberglass and wood ladder beams, damage to the varnish finish on wood ground ladders
13. Correct operation of the pawl assemblies
14. Wire rope on 3- and 4-section ladders for snugness when the ladder is in the bedded position, to ensure proper synchronization of upper sections during operation
15. Weatherproof labels present and legible
16. Ladders clean with no buildup of grease, dirt, or grime on the beams
17. The diagonal brace on the base of a folding ladder for damage
18. The hinge assembly and locking pin assemblies on a multi-purpose ladder for the presence of any visual damage and for their proper operation

Statement of Problem and Substantiation for Public Input

The two comments are added to be in line with 1931. A minimum 3/8 inch diameter halyard and the use of weatherproof labels are called for in 1932

Submitter Information Verification

http://submittals.nfpa.org/TerraViewWeb/ContentFetcher?commentParams=%28Comment...
Submitter Full Name: JAMES GLATTS
Organization: FIRE ONE
Submittal Date: Thu Jan 03 18:28:18 EST 2013

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6.2.7* Halyards and wire rope on extension ladders shall be replaced when they become frayed or kinked.

Replacement halyards should not be less than 9.5 mm (3/8 in.) in diameter with a minimum breaking strength of 374 kg (825 lb). They should be of sufficient length for the purpose intended and should not be spliced. Wire rope should have a 5 to 1 safety factor while supporting two times the dead load weight of the fly section(s) that the wire rope is intended to raise.

Statement of Problem and Substantiation for Public Input

This moves the annex material to the standard. The information on replacement halyards that was in Annex A is right from NFPA 1931. Putting the 1931 halyard information in the standard will assure the same halyard originally installed on the ladder by the manufacturer will be used for any replacements.

Submitter Information Verification

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Public Input No. 7-NFPA 1932-2013 [New Section after 6.2.10.1]

6.2.10.1.1 All metal and fiberglass ground ladders shall bear weatherproof heat sensors that are preset for 149°C (300°F)± 5 percent. Each heat sensor label shall bear an expiration year and wording that indicates that the expiration date is at the end of that year.

Statement of Problem and Substantiation for Public Input

This paragraph adds the details from NFPA 1931 about heat sensor labels and assures replacement labels are the same as installed by the manufacturer when the ladder was new.

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Submittal Date: Thu Jan 03 18:58:15 EST 2013

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7.2.1.4 Metal and Fiberglass Ground Ladders.

Metal and fiberglass ground ladders shall be tested in accordance with 7.2.1.4.1 through 7.2.1.4.8, as follows.

7.2.1.4.3
The ladder shall be loaded with a test load of 159 kg (350 lb) that shall remain in place for at least 1 minute to "set" the ladder prior to the completion of the rest of the test.

7.2.1.4.2
The preload shall be removed, and the distance between the bottom edge of each beam and the surface upon which the ladder supports are placed shall be measured at the lengthwise center of the ladder.

The test load shall then be removed from the ladder and allowed to rest for 5 minutes.

7.2.1.4.5
The distance between the bottom of each beam and the surface upon which the ladder supports are placed shall be measured at the same spot that the measurements were taken in 7.2.1.4.2.

Differences in measurements taken in 7.2.1.4.2 and 7.2.1.4.5 shall not exceed those values shown in Table 7.2.1.4.6.

Table 7.2.1.4.6 Allowable Differences in Horizontal Bending Test Recovery

<table>
<thead>
<tr>
<th>Designated Length of Ladder</th>
<th>Difference in Measurements</th>
<th>m</th>
<th>ft</th>
<th>mm</th>
<th>in</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.6 or less</td>
<td>25 or less</td>
<td>12.7 1/2</td>
<td>2 7/8</td>
<td>127 1/2</td>
<td></td>
</tr>
<tr>
<td>7.7 to 10.4</td>
<td>26 to 34</td>
<td>25.4 1/4</td>
<td>8 1/8</td>
<td>249</td>
<td></td>
</tr>
<tr>
<td>10.5 or over</td>
<td>35 or over</td>
<td>38.1 1/2</td>
<td>12 3/4</td>
<td>381</td>
<td></td>
</tr>
</tbody>
</table>

7.2.1.4.7

Measurements in ft mm in: 7.6 or less 25 or less 12.7 1/2; 7.7 to 10.4 26 to 34 25.4 1/4; 10.5 or over 35 or over 38.1 1/2.
There shall be no visible permanent change or failure of any hardware.

7.2.1.4.

8 Any ladder that exceeds the allowable difference in horizontal bending test recovery, has visible permanent change, or has failure of any hardware shall be removed from service

4- Extension ladders shall then be operated through their entire length with no binding or unsatisfactory operation as a result of the load test.

Statement of Problem and Substantiation for Public Input

In service ground ladder testing only requires the visual inspection followed by the load test and then an operational test. There is no reason and no experience that testing should require the pre-load and measuring of ground ladders.

Submitter Information Verification

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Organization: FIRE ONE
Submittal Date: Fri Jan 04 13:22:14 EST 2013

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Public Input No. 10-NFPA 1932-2013 [ New Section after 7.2.1.5.3 ]

7.2.1.5.4
Extension ladders shall be extended and retracted their entire length with no interference to operation as a result of the load test.

Statement of Problem and Substantiation for Public Input

Adding an operational test will assure there was no damage from the load test.

Submitter Information Verification

Submitter Full Name: JAMES GLATTS
Organization: FIRE ONE
Submittal Date: Thu Jan 03 19:37:59 EST 2013

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Public Input No. 8-NFPA 1932-2013 [Sections 7.2.2.2, 7.2.2.3, 7.2.2.4, 7.2.2.5, 7.2.2.6]

Sections 7.2.2.2, 7.2.2.3, 7.2.2.4, 7.2.2.5, 7.2.2.6

7.2.2.2
The ladder shall be positioned for testing and shall be tested as shown in Figure 7.2.2.2.

Figure 7.2.2.2 Roof Ladder Positioned for Roof Hook Test.

7.2.2.2.1
The ladder shall be hung solely by the roof hooks, with the hooks supported only by the points of the hooks, in a vertical position from a fixture that is capable of supporting the entire test load and weight of the ladder.

7.2.2.2.2
The ladder shall be secured in such a manner as to retain the ladder in the test position to prevent injury to test personnel if the hooks fail during the test.

7.2.2.3
A test load of 454 kg (1000 lb) in weight increments that are consistent with safety and ease of handling shall be placed over as many rungs as needed.

7.2.2.4
The test load shall be applied for a minimum of 1 minute.

7.2.2.5 * —
After removal of the test load, there shall be no permanent deformation.

7.2.2.6 —
If there is any indication of permanent deformation, the ladder shall be removed from service.

Statement of Problem and Substantiation for Public Input

This input deletes the roof hook test. Since 1984 roof ladders are constructed with 3/4 inch steel roof hooks bolted to ladder beams. The 1000 pound roof hook test is useless and does nothing to the steel hooks because they are so strong. There is no loss experience involving properly installed roof hooks on roof ladders. If a roof hook assembly passes visual inspection and an operational test then the roof hook assembly passes 1932 and is suitable for continued use. If the ground ladder is older than 1984 and has 5/8 inch mild steel hooks then the roof ladder should be removed from service until 3/4 inch roof hooks can be installed on the roof ladder.

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Submittal Date: Thu Jan 03 19:06:32 EST 2013

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7.2.3 Test Procedure for Extension Ladder Hardware.

If the ladder is an extension ladder, the hardware shall be tested in accordance with 7.2.3.1 through 7.2.3.6.

7.2.3.1 While the test method depicted in 7.2.3.2 through 7.2.3.5 represents a method of testing the extension ladder hardware, variations of the specific method depicted herein shall be permitted provided the variations are consistent with the intent of this test method, are acceptable to the authority having jurisdiction, and provide equivalent results.

7.2.3.2 The ladder shall be positioned for testing and shall be tested as shown in Figure 7.2.3.2 with the ladder extended a minimum of one rung beyond the bedded position.

Figure 7.2.3.2 Extension Ladder Positioned for Hardware Test.

7.2.3.3 A test load of 454 kg (1000 lb) in weight increments that are consistent with safety and ease of handling shall be placed on the rungs of the fly section.

7.2.3.4 The test load shall be applied for a minimum of 1 minute.

7.2.3.5 Ladders shall sustain this test load with no failure of the hardware and no permanent deformation or other visible damage of the structure.

7.2.3.6
If there is any failure of the hardware, indication of permanent deformation, or other visible damage, the ladder shall be removed from service.

Statement of Problem and Substantiation for Public Input

For the pawl assemblies, if they are clean and lubricated with no mechanical damage or missing parts and the extension ladder operates properly then there is no need to put a load test on the assemblies. There is just no loss experience involving properly operating pawl assemblies and no load test failures.

Submitter Information Verification

Submitter Full Name: JAMES GLATTS
Organization: FIRE ONE
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7.4.5 Metal and Fiberglass Folding and Multi-Purpose Ladders.

7.4.5.1 The ladder shall be loaded with a preload of 73 kg (160 lb).

7.4.5.2 The preload shall be allowed to remain for at least 1 minute to "set" the ladder prior to completing the rest of the test.

7.4.5.3 After the preload is removed, the distance between the bottom edge of each beam and the surface upon which the ladder supports are placed shall be measured at the lengthwise center of the ladder.

7.4.5.4 The ladder shall be loaded with a test load of 102 kg (225 lb).

7.4.5.5 The test load shall remain in place for 5 minutes.

7.4.5.6 The test load shall then be removed and the ladder allowed to rest for 5 minutes.

7.4.5.7 The distance between the bottom of each beam and the surface upon which the ladder supports are placed shall be measured at the same location the measurements in 7.4.5.3 were taken.

7.4.5.8 There shall be no
more than 13 mm (0.5 in.) difference between measurements taken in 7.4.5.3 and 7.4.5.7.

There shall be no visible permanent change or failure of any hardware.

The ladder shall be capable of being folded or retracted back to its stowing configuration.

Any ladder that does not meet the test criteria of 7.4.5.8, 7.4.5.9, and 7.4.5.10 properly fold and retract shall be removed from service.

Statement of Problem and Substantiation for Public Input

The measurements after the load tests are subjective. The bottom line is that the ladder does not bend or break and operates properly after the load test.

Submitter Information Verification

Submitter Full Name: JAMES GLATTS
Organization: FIRE ONE
Submittal Date: Thu Jan 03 19:53:40 EST 2013

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Public Input No. 15-NFPA 1932-2013 [ Section No. 7.4.6.4 ]

7.4.6.4
If the ladder does not meet the test criterion of 7.4.6.3—properly operate and fold—it shall be removed from service.

Statement of Problem and Substantiation for Public Input

The bottom line is that the ladder operate properly after a load test.

Submitter Information Verification

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Submittal Date: Thu Jan 03 19:59:58 EST 2013

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Public Input No. 16-NFPA 1932-2013 [ Section No. A.6.1.3(15) ]

A.6.1.3(15)
NFPA 1931, Standard for Manufacturer's Design of Fire Department Ground Ladders, has required the following labels on new ground ladders since 1984:

(1) Electrical hazard warning label
(2) Ladder positioning label
(3) Staypole positioning instruction label
(4) Length designation markings

All replacement labels shall be weatherproof.

Statement of Problem and Substantiation for Public Input

This comment in the annex reminds everyone that all labels shall be weatherproof.

Submitter Information Verification

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Organization: FIRE ONE
Submittal Date: Thu Jan 03 20:04:51 EST 2013

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A.6.2.7—

Replacement halyards should not be less than 9.5 mm (3/8 in.) in diameter with a minimum breaking strength of 374 kg (825 lb). They should be of sufficient length for the purpose intended and should not be spliced. Wire rope should have a 5 to 1 safety factor while supporting two times the dead load weight of the fly section(s) that the wire rope is intended to raise.

Statement of Problem and Substantiation for Public Input

Public Input No. 5 moved this paragraph to the body of the standard. This input deletes the paragraph from the annex.

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Submittal Date: Thu Jan 03 18:52:28 EST 2013

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Statement of Problem and Substantiation for Public Input

NFPA 1500 section 6.5.11 requires that all ground ladders be inspected and service tested in accordance with the applicable requirements of NFPA 1932, Standard on Use, Maintenance, and Service Testing of In-Service Fire Department Ground Ladders. Adding NFPA 1500 to Annex B will provide a reader or user of NFPA 1932 with the standard that requires ground ladders be inspected and service tested.

Submitter Information Verification

Submitter Full Name: JAMES GLATTS
Organization: FIRE ONE
Submittal Date: Thu Jan 03 17:54:02 EST 2013

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