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Fall Protection Resources for New Home Construction

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Fall Protection Resource for New Home Construction Final Report

Study # 13-5-PS, September 30, 2014

Abstract

Falls from height remain the most common cause of construction worker fatalities and falls continue to happen at an alarming rate¹. Despite an increase in commercially available fall prevention devices and more stringent federal safety standards², conventional fall protection is rarely used in residential construction^{3,4}. In this research, we constructed a website that describes fall protection devices appropriate for residential construction and cross-walked devices to construction stage. We include descriptions, pictures, installation instructions, and links to manufacturer, vendor, cost, manual, and videos for each device. After receiving positive feedback regarding functionality, content, and usefulness, a link to the website is being disseminated to federal agencies, national associations, and regional organizations for posting on their websites. Results were disseminated through peer-reviewed venues. We expect that a broad range of residential contractors will use this resource to identify practical solutions to protect their workers and decrease morbidity and mortality due to falls.

Key findings of this research

1. The number and variety of fall protection devices with applications for residential construction is increasing; we identified over 300 different devices and included 148 devices in our website.
2. Most manufacturers of fall protection devices are interested in increasing use of fall protection methods in residential construction; 26 of the 34 manufacturers we contacted for inclusion of their devices granted permission for use of their photographs and linking to their websites, with 23 manufacturers represented on the website.
3. Constructing the website with two methods of entering was favorably perceived by users who tested the website; users can enter by type of device or stage of construction.
4. Users perceived that the website contained accurate content, was well-organized and easy to navigate, and increased their awareness of fall protection devices. Some even said that they will increase use of fall protection devices as a result of visiting the website.
5. National agencies, associations, organizations, and peer-reviewed venues are anxious to disseminate and learn about the website of fall protection devices for residential construction.

Introduction

Residential construction sites are now required to use conventional methods of fall protection mandated in OSHA's Construction Standards 1926⁵ when employees are working six feet from a lower level. Since 1998, contractors were able to use OSHA-approved alternative methods of fall prevention without having a specific fall protection plan for each construction site⁶. These methods included warning lines at floor openings, controlled access zones at leading edges, and slide guards on roofs. This major shift in fall protection requirements is forcing residential contractors to institute major and rapid revisions in their current fall prevention practices. In order to introduce conventional fall protection equipment appropriate for each phase of residential construction, OSHA prepared a Guidance Document for Residential Construction⁷. This resource demonstrates a

wide range of fall protection equipment; however, essential details about the equipment are not described, such as the device name, contact information, and applications.

Most small and medium-sized residential builders do not have the time and resources to search for fall protection devices based upon the pictures or generic description provided in the Guidance Document. This is especially true as contractors recover from the economic recession which saw a 75% drop in new home starts⁸. In order to access fall prevention devices that are well-suited for their context, contractors are spending weeks searching the internet, consulting with OSHA, and calling vendors⁹. Even large, national home builders report that they struggle to comply with these new standards amidst major lay-offs and negative profit margins; often purchasing fall protection equipment that does not match their needs. Since falls from height account for the majority of fatalities and many injuries in residential construction, this research project developed an electronic resource to help residential contractors find and choose fall protection technologies appropriate for the types of structures they build, building practices, geographical terrain, and their mix of workers.

This resource will help residential contractors comply with OSHA's more stringent fall protection requirements. By presenting a wide array of devices, this resource allows users to identify, compare, and choose the most feasible fall protection equipment for their specific building situation. Providing access to this resource at governmental websites that construction professionals visit for fall protection information, such as the OSHA, NIOSH, CPWR, National Fall Prevention campaign, and eLCOSH websites, it will reach a greater proportion of the intended audience. This resource is grounded in the real-world needs of the user community, increasing the likelihood of widespread use.

This small one-year grant worked toward achieving several NORA2 goals:

- Strategic goal 1 – Reduce Construction Worker fatalities and serious injuries caused by falls to a lower level
- Research goal 1.1.1 – Inventory existing fall protection technologies and identify three gaps where technical engineering guidance needs to be developed or modified further for fall protection.
- Intermediate goal 1.2 – Partner with Construction stakeholders to expand awareness and use of existing effective fall prevention and protection solutions by construction employers and workers
- Research to practice goal 1.2.6 – Utilize existing information about fall prevention/protection solutions to develop and disseminate trade-specific materials for the major categories of falls from heights associated with fatal and serious injuries to include awareness materials, business case studies, implementation guidance, and training materials in paper and electronic media.
- Research goal 1.2.2 - Reduce Construction Worker fatalities and serious injuries caused by falls to a lower level
- Research to practice goal 1.1.3 – Disseminate these solutions and guidelines throughout the industry

Objectives

Specific Aim #1: Develop a current, comprehensive inventory of fall protection technology and methods for all phases of the home building process.

Specific Aim #2: Disseminate the resource through nationally recognized websites, print, and electronic media.

Specific Aim #3: Track the outreach and effectiveness of our dissemination efforts.

Methods

We compiled a list of fall protection devices for residential construction from OSHA's Residential Guidance Document, previous funded research that identified 43 fall protection devices appropriate for residential construction¹⁰, internet search using various search engines, and contact with carpentry professionals, construction safety experts, and equipment and tool manufacturers. For each device, we compiled: 1) device name, 2) manufacturer, 3) description of device purpose, 4) stage of home construction, 5) brief installation description, 6) pictures and videos of the device in use, 7) links to instruction manuals, 8) cost, and 9) vendor information. A small group of carpentry professionals served as our advisory team for each phase of the project. After mocking up several design options for the website, we chose a design that was visually appealing, easy to navigate, and could adjust to either a computer or mobile device. Each device is on the website by device type, plus it is linked the applicable stage(s) of construction. Throughout the process we demonstrated the web-based resource to our advisory team and made adjustments based upon their feedback. After the final website of 148 devices was complete, we performed user testing with residential contractors, carpenters, safety experts, and carpenter apprenticeship trainers (15 total) and made modifications based upon this usability testing.

In order to insure that the resource is accessed by a large number of residential carpenters and contractors, we are posting a link to it on the websites of government-sponsored and private national organizations. We expect that making these materials available on several widely accessed websites will increase the likelihood that it will be accessed by our target audience. We are working with officials at the following federal agencies and organizations: Center for Construction Research and Training, Campaign to Prevent Falls in Construction, Electronic Library of Construction Occupational Safety and Health, Occupational Safety and Health Administration, National Institute of Occupational Safety and Health, National Association of Home Builders, and the National Safety Council. We hope that one of these national agencies or organizations will agree to permanently house the fall protection technology resource to capture direct traffic to the website and to provide regular maintenance and update the resource as new devices are developed and internet links are constantly changing. We have plans to maintain the website for the next six months, but will need additional funding to maintain it on a regular basis.

We will measure dissemination of the fall protection research using Google Analytics for one year after it has been disseminated. Based upon metrics from OSHA and CPWR for the Campaign to Prevent Falls in Construction, we anticipate at least 3,000 views of our fall protection resource within the first year after it is posted. A pop-up survey on the website will gather website users' opinions about the content and usability of the resource, effect of the website on user knowledge and intentions to purchase and use fall protection, demographic data, and contact information to measure the long-term effect of this resource on fall prevention behaviors and purchasing patterns

for fall protection equipment. We will compile the survey responses as process and outcome measurements. We anticipate that 1,000 visitors will respond to the survey.

Results/Accomplishments

The resultant web-based residential resource includes 148 fall prevention devices appropriate for residential construction from 23 different manufacturers. Most manufacturers were anxious to allow us to use their pictures of the devices and to allow us to link to their website, however 7 did not respond to numerous requests from us and one declined to participate. The website can be entered by: 1) type of fall prevention device (guardrail, hole cover, safety nets, scaffolds, lifts, ladder accessories, and personal fall arrest – anchors, lanyards, self-retracting lifelines and harnesses), or 2) stage of construction (installation of floor joists, walls, floor sheathing, windows and doors, roof trusses, roof sheathing, roof shingling, siding, HVAC, attic work, and maintenance). Designing the website in this manner required extensive programming; however, this increases overall usability. This is especially important for our end users, who may have limited internet searching expertise. *Appendix A* is a screen shot of the two methods to enter the website. For each device we describe: 1) its purpose, 2) stage of construction it can be used for, 3) installation instructions, 4) instruction manual, 5) manufacturer, 6) price range, and 7) vendors who sell the device (*Appendix B*). The instruction manual is linked to the website, this ensures that the instructions are up-to-date and keeps the website size manageable. For each device, we include a close up picture as the gallery image, plus 1-3 additional images of the device used in context. If a video is available, it is provided.

The number of fall prevention and protection devices that are commercially available is much greater than we anticipated. For example, the category for anchors has over 50 devices. Our advisory panel helped us identify features for device categories that had a large number of different devices. As a result, we have several devices with each feature in our website instead of all of the devices that we could find for a category. The basic following device features identified for harnesses for personal fall arrest systems included: basic harness, adjustable, padded, female version, extra small and large sizing, and tool pouch. This process was performed for harnesses, self-retracting lifelines and lanyards.

In order to ensure that the website was visually appealing and easy to navigate, we designed several templates and iteratively adjusted the layout, organization, color contrast, and font until we arrived at a design that best meets the needs of the end users. We were told by our advisory team that construction professionals will access the website using mobile devices while at the construction site, therefore the website uses responsive design to automatically adjust to the device, whether computer, tablet, or cell phone.

We designed a pop-up survey on the website to gather users' opinions about the content and usability of the resource, effect of the website on user knowledge and intentions to purchase and use fall protection, demographic data, and contact information to measure the long-term effect of this resource on fall prevention behaviors and purchasing patterns for fall protection equipment. (*Appendix C*). This will be tracked for at least one year after funding expires.

Changes/problems that resulted in deviation from the methods

Securing approval from device manufacturers to utilize photographs published on their websites required time and effort that we had not initially anticipated. We consulted the University's attorneys to design the approval procedures and documents and received approval from each manufacturer of devices that are included on the website (*Appendix D*). Since we identified more fall prevention devices and manufacturers than we had planned on, securing manufacturers' approval to use their pictures on our website pushed us behind our timeline. As a result, we had to train a new research assistant midway through the project as the graduate student who had been serving that role was no longer at the University.

While reviewing materials about fall protection devices included on our website, it became evident that we would need a disclaimer for the website. The University attorneys guided us in crafting a disclaimer for the website, which describes the purpose of the website, funding source, disclosures, safety warnings, liability statement, and use of third-party website links on the website (*Appendix E*). This involved considerable more time than could have been anticipated.

The final problem encountered during this project involved computer server issues. We had spent nine months building the website on Washington University's Occupational Safety and Health's website; however, this website was being de-activated and its contents were being moved to a new server. Moving our website to this new server was going to require re-building of all of our content using the new content management system they were using on the new server. After beginning this process and seeing how timely it was going to be, we consulted Washington University's Program in Occupational Therapy about using their server as we could transfer the existing work. Since the Principal Investigator's primary faculty appointment and this small grant was managed in Occupational Therapy, moving the website was a logical and timely solution.

Results

We have performed user testing of the website to get feedback regarding functionality, usefulness, and effectiveness. Users were taken through a procedure to review all portions of the website and directed to an online survey (*Appendix F*). They rated level of agreement to 10 statements (5-point scale) and usefulness of 8 features of the website, plus provided feedback and suggestions. To date, 14 individuals have participated in the user testing, including 1 owner of a residential contracting company, 4 safety personnel with residential contracting firms, 1 risk management specialist, 6 carpenter instructors, and 2 construction workers. These individuals represented firms with less than 10 to over 100 employees. All users reported that the website opened and all links tested were accurate; most users reported that the website opened correctly on their mobile device. As can be seen in the tables below, the feedback was overwhelmingly positive about the website, its design, and functionality. We were especially happy to see that users felt the website stated that their awareness of fall prevention devices increased and that they were more likely to use and purchase fall prevention in the future as a result of visiting our website.

5-point scale	Mean Score	Strongly agree = 5	Agree = 4	Neutral = 3	Disagree = 2	Strongly disagree = 1
Information on site very useful	4.57	8	6	-	-	-
Organized in logical manner	4.57	8	6	-	-	-
Easy to navigate	4.57	8	6	-	-	-
Information correct	4.29	7	4	3	-	-
Increased awareness of FP	4.29	6	6	2	-	-
Device linked to correct stage	4.14	4	8	2	-	-
Alerted to safety precautions	4.07	6	4	3	1	-
Increased FP awareness	3.50	2	4	7	1	-
Will visit site again	4.14	4	8	2	-	-
More likely to purchase/use FP	3.14	-	3	10	1	-

4-point scale	Mean Score	Extremely Useful = 4	Useful = 3	Somewhat Useful = 2	Not Useful = 1
Pictures	3.79	11	3	-	-
Videos	3.50	8	5	1	-
Purpose Description	3.36	5	9	-	-
Instruction Manual	3.29	4	10	-	-
Vendor	3.07	5	6	2	1
Cost	3.21	6	6	1	1
Organized by category of FP	3.79	11	3	-	-
Organized by construction phase	3.64	9	5	-	-

Based upon user feedback, we added a statement to all anchors stating that the structure they are attached to must be able to support 5,000#; this stemmed from the fact that roof trusses may not be rated for an anchorage point. One user provided feedback that we included devices from a small number of vendors and neglected two specific manufacturers giving “the appearance that this is sponsored content”. However, we had 10 devices from one of these vendors and 3 from the other (they carry a multitude of devices but only manufacture several devices appropriate for residential construction). We are providing the link to the website to manufacturers that provided permission for their devices for their feedback; if information needs to be changed for accuracy, we will make these changes quickly. The manufacturer of the device that is pictured on the front of OSHA’s Guidance Document for Residential Construction, made the following statement about our web-based resource. We are *“excited to see an organization assisting the residential construction industry in finding the new technology available for them to use in regards to fall protection. Protecting the workforce in the residential construction industry from falls is a priority considering all the unnecessary injuries and fatalities that occur in the industry. With having access to the products available I would expect that contractors and sub-contractors will be able to make more educated decisions on how to protect their workers. Thank you!!”*

Although we were not able to gather and report on the analytics for our website during the funding period (number of visits, location of users, device used to access the website, time spent on the website, and websites visited immediately before and after our website), we will gather this data for the next year using Google Analytics. We will tabulate survey results from visitors to the website

and analyze these to understand characteristics of visitors to our website, their perceptions of the content and usability of the website, and their intentions to purchase fall prevention equipment.

Future funding plans

We would like to secure additional funding to update the website with new devices and maintain the website. In order to keep abreast of new devices, we hope to contact the manufacturers with devices on the website twice yearly to find out about any new devices they have designed that are appropriate for residential construction. We would get information about these devices and continue to populate the website. We would also check the links from our website for accuracy and check partnering agencies/organizations websites to be sure that their links to our website are still visible and active. On an annual basis we would also like to update vendors and prices. We anticipate that costs to maintain the website would be approximately \$4,000 per year.

Publications

Kaskutas V, Evanoff B, Miller H. (2013). Fall Prevention on Residential Construction Sites. *Professional Safety*. 58(7):36-40.

Kaskutas V, Hunsberger K. (2013). Residential Fall Protection Case Study - Habitat for Humanity St. Louis. *Wood Design Focus*. 23(1):6-12.

Presentations

Kaskutas V, Strickland J. *Preventing falls from height in residential construction workers: Development of a website of fall protection devices*. American Public Health Association's Annual Convention, November 18, 2014, New Orleans, LA.

Kaskutas V, Cunningham T, Lundegren B, Showalter P, Matuga R, Schneider S, Stribling C. *Reaching Small Businesses in Construction – A Panel Discussion*. National Occupational Research Agenda Construction Sector Council, November 13, 2014, Washington DC.

Kaskutas V, Stelzer B. *Fall Prevention in Residential Construction*. Tenth Annual Greater St. Louis Safety and Health Conference, October 22, 2013, St. Louis, MO.

Kaskutas V. *Safety Communication and Fall Prevention Training for Construction Foremen*. Occupational Science Summit, May 10, 2013, Chicago, IL.

Kaskutas V., Mormann J, Drendel-Mueller L. *Improving fall prevention and safety communication in residential foremen*. Construction Safety Council Annual Construction Expo and Safety Day, February 27, 2013, Chicago, IL.

Mormann J. *Fall prevention*. Midwest Construction Safety Conference in Kansas City, MO.

Dissemination plan

Since this project stemmed from OSHA's Guidance Document for Residential Construction, we are happy to report that OSHA's Directorate of Construction has agreed to disseminate the website. He is personally emailing 100 field offices, 27 state plans, 54 consultation programs and 30 OSHA education centers, posting a short piece about the website in their bimonthly QuickTakes newsletter, which reaches over 70,000 subscribers, and to plans to post links to the website from some of their construction web pages.

We are in discussions with NIOSH, CPWR, the National Fall Prevention Campaign, and the Electronic Library of Construction Occupational Safety and Health about posting a link to the website on appropriate pages of their website. NIOSH provided a letter of support for the project stating that they would post links to our resource on their website. We are working with the National Safety Council, the National Association of Home Builders, and several carpenters' training centers across the country to disseminate the resource, as well as trade magazines. We are also working with regional carpenters' unions to post links to our website on their website and to send out emails and other communications to their members, including the Greater St. Louis Vicinity Carpenters District Council (covers all of Missouri and Kansas and southwestern Illinois), Pacific Northwest (Washington, Oregon and Idaho), and Northern California (covers 46 northern California counties). Manufacturers of equipment demonstrated in the website are also disseminating our online resource through social media, electronic communication, and personal communications.

We have presented this research at several peer-reviewed conferences and other national, regional, and local venues; including the Construction Sector of the National Occupational Research Agenda, National Occupational Therapy Summit of Scholars, Construction Safety Council Annual Construction Expo and Safety Day, Greater St. Louis Safety & Health Conference, Midwest Construction Safety Conference in Kansas City, to residential construction foremen/superintendents/owners participating in our fall prevention and safety communication training, and to Washington University occupational therapy graduate students. We are presenting an oral paper about this project at the American Public Health Association's Annual Convention in New Orleans in November, 2014 and plan to share with members of NORA's Construction Sector at the November meeting. We will submit results of the project to a peer-reviewed journal and at least one trade magazine. This research has also served as a springboard to several grant applications, including one to CPWR, NIOSH and an OSHA Susan Harwood grant. Although we have not yet secured funding, we are submitting a new project to NIOSH that will utilize the website developed for this research.

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⁸National Association of Home Builders. 2012. Residential Construction Industry Fatalities 2003-2006.

⁹Kaskutas, V, & Hunsberger, K. (2013). Residential Fall Protection Case Study:Habitat for Humanity St. Louis. *Wood Design Focus.* 23 (1), 6-13.

¹⁰Kaskutas V, Evanoff B, Miller H. (2013). Fall Prevention on Residential Construction Sites. *Professional Safety.* 58(7):36-40.

Appendices

- A Website Landing Page
- B Device Page
- C Website Visitor Survey
- D Device Manufacture Approval Letter
- E Website Entry Disclosures and Warning
- F User Testing Directions

Appendix A – Website Landing Page

Welcome! Fall Protection Resource for New Home Construction

This website catalogs fall protection equipment for residential construction. Equipment is classified by the type of fall protection or the phase of construction. This website was supported by CPWR through NIOSH cooperative agreement OH009762.

Click on a picture below to enter that portion of the resource. If you are using Internet Explorer browser (version 7 or older) and the content is too large for your screen, click "Tools" on your IE browser – Select "Compatibility View settings", and remove the wustl.edu address from the list generated.

Type of Fall Protection



[PFAS](#)

[Guardrails](#)

[Hole covers](#)



[Safety Nets](#)



[Scaffolds](#)



[Lifts](#)



[Ladders](#)

Phase of Construction



[Floor joist](#)

[Wall](#)

[Floor sheathing](#)



[Window](#)



[Roof truss](#)



[Roof sheathing](#)



[Roof shingling](#)



[Siding](#)



[HVAC](#)



[Attic work](#)



[Maintenance](#)

All contents © Fall Protection Resource. All rights reserved. Use of this website constitutes acceptance of our Terms & Conditions | [Disclaimer](#) | [Home](#) | [Web Site Information](#) | [Survey](#)

Appendix B – Device Page

Safety Boot Guardrail System Guardrail

Purpose

Plastic housing that attaches to the subfloor to create free-standing guardrails.

Phase of Construction

Wall installation, roof sheathing, shingling, maintenance

Manufacturer's Device Page

[Safety Maker Inc.](#)

Installation

Boots are installed less than 8' apart using four 3/8"x2" hex head lag screws in solid wood substrate, five 3/8"x2" hex head lag screws for I-floor, four 3/8"x3" hex head lag screw into plywood/OSB with additional blocking behind board, and four 3/8" masonry anchor for concrete. 1 1/2" fender washers are used on each screw. Warning: Users must strictly adhere to the manufacturer's inspection, installation, maintenance and use directions; and must follow local, state and federal safety regulations. Failure to do so could result in serious injury or death.

Manual

Furnished with purchase

Vendor

Call for distributors and resellers in your area:
1-800-804-4744, [safetyboot.com](#), [amazon.com](#), [applesafety.com](#), [dhcsupplies.com](#), [erniestools.com](#)

Cost

\$25-39 for 1, \$100 for 4, \$300 for 12



Safety Boot Guardrail System



Safety Boot Guardrail System



Safety Boot Guardrail System

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[Disclaimer](#) | [Home](#) | [PFAS](#) | [Survey](#)

Appendix C - Website Visitor Survey

Fall Protection Resource User Survey

Please rate your level of agreement with the following statements.

1. Prior to visiting this website, I was very familiar with the wide range of fall protection devices.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

2. Now that I have visited the website, I am very familiar with the wide range of fall protection device

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

3. The information provided on this website is extremely useful.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

4. Because of this website, I am more likely to purchase/use fall protection devices at work?

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

We would like to know about your current work practices.

5. How often do you and your co-workers use fall protection (guardrail, personal fall arrest system, or safety net) when working at heights over 6 feet from a lower surface?

- Never
- Rarely
- Occasionally
- Often
- Always

6. What types of fall protection are you currently using at your worksites? Mark all that apply.

- Guard rails
- Personal fall arrest systems
- Safety nets
- Scaffold systems that provide protected walkways

Other (please specify)

We would like to know who is interested in fall protection resources.

7. What is your position?

- Owner/co-owner
- President/CEO
- Safety director
- Superintendent/riding boss
- Foremen
- Construction Worker

Other (please specify)

8. What type of construction do you perform the most?

- Single family homes and multi-family homes up to 4 units per structure
- Residential multi-family homes/apartments over 4 units per structure but not commercial
- Commercial
- Industrial

Other (please specify)

9. Approximately how many people work for your current employer?

- Less than 10
- 10 to 25
- 26 to 50
- 51 to 75
- 76 to 100
- Over 100

10. What is your age?

- Under 30 years
- 30-39 years
- 40-49 years
- 50-59 years
- 60-69 years
- >70 years

11. Please provide your email address so we can provide you with additional fall prevention resources. This will not be shared for other purposes.

Email Address:

12. We would like to know how we can improve this website; please provide your ideas below. Thank you very much for your time. Please visit this website often!

Appendix D - Device Manufacture Approval Letter

Dear _____:

I am an occupational safety and health researcher at Washington University School of Medicine in St. Louis. I have received funding from the Center for Construction Research and Training [<http://www.cpwr.com/index.html>] to develop an electronic resource that describes fall protection devices appropriate for residential construction. I would like to include several of the devices manufactured by your company in this resource; therefore I am requesting permission to utilize images of the devices on your website. This resource will be housed on a Washington University website which will be linked to the websites of several federal safety agencies. We will actively disseminate this resource; we anticipate it will be widely accessed by construction professionals.

With that in mind, I am requesting an irrevocable, non-exclusive right, license, and privilege to reproduce, transmit, distribute, or otherwise use the images on your website [<http:///>] in any format and in all media, now known or later developed, and in derivative works throughout the world, on a royalty-free basis. I will acknowledge the source of your images in accordance with scholarly norms. If you require any particular form of acknowledgment, please let me know.

If you are in agreement, please respond to this email granting your permission. If you have any questions or concerns, you can contact me at kaskutasv@wustl.edu or 314-286-1672.

I hope that you will allow these images to be included on this fall protection resource. Inclusion of pictures of the device will improve construction professionals' ability to envision uses for the device at their worksites. And ultimately achieve our joint goals of preventing construction worker falls.

Thank you very much.

Vicki Kaskutas, OTR/L, OTD, FAOTA
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Appendix E – Website Entry Disclosures Warning

This website was developed by faculty members at Washington University in St. Louis ("WU") and supported by CPWR through NIOSH cooperative agreement OH009762. The purpose of this website is to catalogue fall prevention devices utilized in residential construction. It is an educational site and is intended for informational purposes only. WU has no commercial or financial relationship with the manufacturers of any of the identified products and does not endorse the use of any of these specific devices. Website users should select devices based upon their professional expertise and closely follow all manufacturer's instructions, requirements, and warnings. WU makes no warranty of any kind as to any of the products identified on this website, and WU is not responsible for any damages or losses whatsoever arising out of or resulting from the use of any of the identified products.

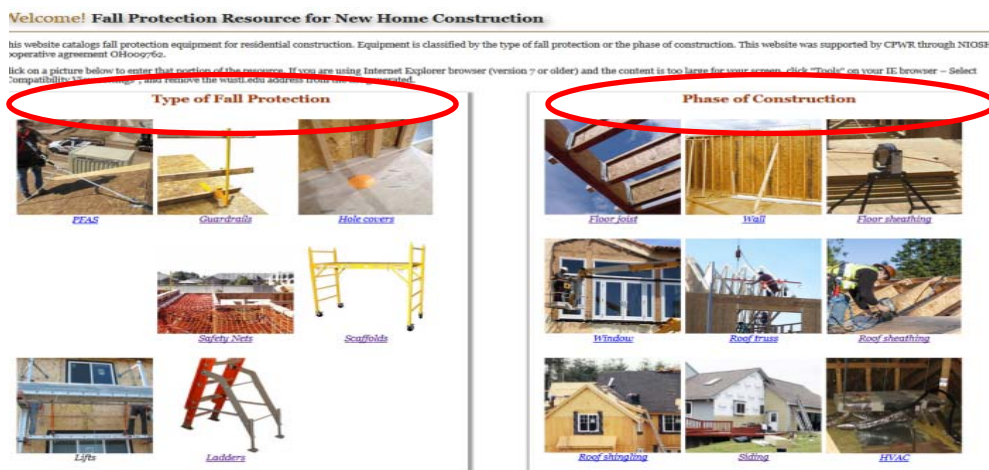
This website contains links to third-party websites. These links are provided solely as a convenience and not as an endorsement by WU of the contents of any of those third-party websites. WU is not responsible for the content of linked third-party sites and does not make any representations regarding the contents or accuracy of the material on those sites.


[Enter Fall Protection Equipment Resource Website](#)

Fall Prevention Resource User Testing Procedures

Overview of Website and Website Link

- Using a desktop or laptop computer, go to <http://www.ot.wustl.edu/fptech/homepage.htm>. The website should look like this when it opens.



- If are using an older version of Internet Explorer  and the content is too large for your screen, you will need to **adjust your settings**.
 - Click “Tools” on your IE browser
 - Select “compatibility view settings”
 - Remove the wustl.edu address from the list generated
 - Your view should be correct now
 - These instructions are also listed under the Welcome statement on the Home page.
- You can enter the website by the **type of fall protection** (on left) or the **phase of construction** (on right). This allows the user to find a specific device when they know the type of fall protection that they need, or to search for devices that might be useful during a specific phase of home building. Since one device may be useful for several phases of construction, the same device will occur in various places throughout the website.
- Once you click on a **type of fall protection** (such as guardrail or scaffolds), you will be taken to a gallery page that includes the names/pictures of the devices. If there are a lot of devices they will be on multiple pages (12 devices per page), which is numerated at the top.

Exploring our Website (30 minutes)

Please follow the directions below and think about the type of information included in the website and the organization.

Type of Construction (Left Side) of screen

- Click on **hole covers**.
Since we could only find 3 commercially available hole covers appropriate for residential construction, you will only see 3 on this page (2 have the same name). The website should look like this when you open hole covers.



Return back **Home** and click on **PFAS** link. →

PFAS links to the various components of a personal fall arrest system, *Anchors, Harnesses, Lanyards, and Self-retracting lifelines*. Since there are so many different types of harnesses and lanyards, our goal was to include several devices that represent the different characteristics of devices in that category. Since some of these devices are so small, we do not include pictures of the device being used at a residential build as you would not be able to see the device. Please spend 5-10 minutes looking around these four **PFAS** categories, considering how informative they can be for both experienced and inexperienced workers. We will be asking you questions about these in just a few minutes.

Type of Fall Protection

Personal fall arrest systems (PFAS)



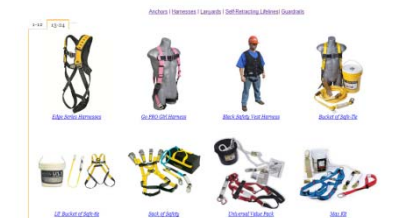
9. **Click on Anchors** – we included 51 anchors; both temporary anchors, which are removed after the build, and permanent anchors that stay on the home forever for maintenance work. Some anchors bolt or nail to the sheathing, roof trusses, and top plates, others wrap around stabilized boards; others are erected in the building. Since building practices vary in different parts of the country and they are constantly evolving, devices that may have been only used in commercial settings are included as they may have residential applications. Spend a fair amount of time reviewing all 5-pages of anchors that we have on the website.

Anchors Personal fall arrest systems (PFAS)



10. Return back to **PFAS** and Click on– **Harnesses** – we included basic, padded, vest style, tool bag, female, heat wicking, and PFAS kits that include harnesses. See if there is a harness that would meet your needs.

Harnesses Personal fall arrest systems (PFAS)



11. Return back to **PFAS** and Click on – **Lanyards** – we included fixed, shock absorbing, 100% tie off, energy absorbing lanyards, different materials (cable, rope, Kevlar) and different attachments types. Explore these lanyards and think about types of other lanyards that may be useful on residential builds.



12. Return back to **PFAS** and Click on – **Self-retracting lifelines** – these mainly vary by size, weight, materials, attachments, and whether they can be used above head or at foot level. Look at the weights of these SRLs.

13. Return back to **Home**.

Phase of Construction (Right Side) of screen →

It is time to look at the **phase of construction** method of entering the website. The phases are arranged as the home building progresses, from floor joist installation to roof shingling. Most of the pictures demonstrate new construction, but many of the devices are appropriate for home remodeling. Please surf around the various phases of construction and explore the devices we have listed. These will be the same devices you have already seen; they are just arranged differently.

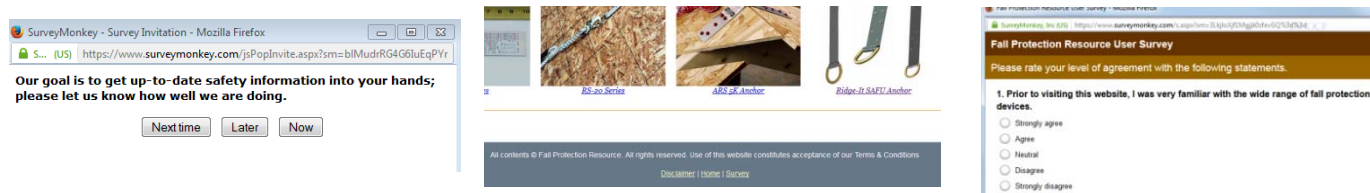
Phase of Construction



Phone Version of Website - We need to assess how the website works on your **cell phone**. Please go to <http://www.ot.wustl.edu/fptech/homepage.htm>. Open up a few devices and read through them; also test out the links. Consider how it looks and functions in comparison to the computer version.

CONFIDENTIAL SURVEY (15 minutes)

Now that you have fully explored the website, **it is time to give us your opinions**. When you opened the website the survey should have popped up; if so it may be open in another window of your computer. If the survey is not open, scroll to the gray bar at the bottom of any page and click on **Survey**. Or you can go to <https://www.surveymonkey.com/s/F6WS68W> to take the survey.



Please answer all 19 questions in the survey and hit “Done” to submit. Thank you!

