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# Reducing Falls during Residential Construction: Floor Joist Installation and Decking

Installing floor joists and decking can be a dangerous task if precautions are not taken to prevent falls. It is important to protect workers engaged in “leading edge” work to ensure that they do not fall through openings to lower levels. This fact sheet highlights some of the risks associated with installing floor joists and decking, and details various methods that employers can use to protect workers performing these tasks. The fall protection methods in this fact sheet may not be suitable in all situations. Employers are responsible for ensuring compliance with applicable OSHA requirements.

## Risks While Installing Floor Joists and Decking

Floor joists are typically set directly over foundation walls or framed walls. If workers stand on the joists or walls without fall protection, they can fall through to lower levels. Fall hazards are likely to be present if the structure being built has multiple stories. The use of effective fall protection can prevent a serious fall. The employer must provide a training program for each worker who might be exposed to fall hazards. The program must enable each worker to recognize fall hazards and train each worker in the procedures to follow to minimize these hazards. For fall protection training requirements, refer to 29 CFR 1926.503. In all cases, employers must evaluate the hazards and take steps to reduce the risk of falls.



## Reducing Risks:

### Planning

Planning for the use of fall protection equipment can help employers protect workers from falls. Before beginning the job, identify fall protection needs. Once appropriate fall protection systems have been identified, have those systems in place before the workers report to the job.

### Using the Right Equipment

Employers generally must ensure that workers use fall protection meeting OSHA requirements whenever they work 6 feet or more above a lower level (29 CFR 1926.501(b)(13)). There are guardrail systems and personal fall arrest systems available that can provide workers the flexibility they need during floor joist and decking installation. Some systems are more efficient than others because, in many cases, the employer can use the same system for both tasks. Employers may also choose to use scaffolds or ladders for floor joist installation and decking.

**Note:** OSHA’s fall protection requirements for residential construction work performed on scaffolds and ladders are specified in Subpart L and Subpart X, respectively, not in 29 CFR 1926.501(b)(13).

### Scaffolds

Scaffolds, erected on the inside or outside of the house, can be used while workers install floor joists. Engineered bracket scaffold systems and job-built scaffold systems can provide workers with stable work platforms when they install floor joists and possibly while they attach some of the decking. These types of scaffolds can be adjusted to a comfortable work height. Always follow the manufacturer’s instructions or consult a qualified person to ensure that scaffold systems are used safely. Employers must ensure that employees on scaffold systems 10 feet or more above a lower level are protected from falls. Mobile scaffolds can be an effective method for lifting workers up while providing protection from falls. For work on the first floor of a

residence, mobile scaffolds can be placed on the cured concrete basement floor. From the elevated platforms, workers can install primary beams and floor joists, and they may also be able to tack some of the decking into place. For complete requirements for scaffolds, refer to 29 CFR 1926 Subpart L - Scaffolds.



### Ladders (A-frame and platform)

Workers can use A-frame and platform ladders to install floor joists and decking. Platform ladders can provide workers a stable work base and give them more flexibility while maneuvering and positioning floor joists into place. Always follow the manufacturer's instructions about the safe use of, and load limits for, ladders. For requirements for ladders, refer to 29 CFR 1926 Subpart X – Stairways and Ladders.



### Personal Fall Arrest System (PFAS)

Once the first row of subfloor has been secured, a PFAS can be used. Strap anchors and specially made leading edge retractable lifeline systems are options to consider.

### **Personal Fall Arrest System**

A PFAS is designed to safely stop a fall before the worker strikes a lower level. The system includes three major components:

- A. An anchorage to which the other components of the PFAS are rigged.
- B. A full body harness worn by the worker.
- C. A connector, such as a lanyard or lifeline, linking the harness to the anchorage. A rip-stitch lanyard, or deceleration device, is typically a part of the system.



For more information on the requirements for a PFAS, refer to 29 CFR 1926.502(d).

Remember that workers must use full-body harnesses in fall arrest systems. Body belts can cause serious injury during a fall, and OSHA prohibits their use as part of fall arrest systems.

### Attaching Anchors

OSHA requires that anchors for a PFAS either be able to hold at least 5,000 pounds per worker or maintain a safety factor of at least two (twice the impact load) and be used under the supervision of a qualified person. Always follow the manufacturer's instructions or consult a qualified person when installing anchors to ensure that they are strong enough to hold the sudden weight of a falling worker. There are anchorages available on the market that can meet OSHA's strength requirements if they are installed in accord with the manufacturer's instructions, with the right number of properly-sized nails or screws.

### Fall Restraint

Fall restraint systems prevent falls by keeping the worker from reaching a fall hazard. While fall restraint systems are not mentioned in OSHA's fall protection rules, OSHA will accept a properly used fall restraint system in place of a personal fall arrest system when the restraint system is rigged so that the worker cannot get to the fall hazard. In effect, (if properly used) the system tethers a worker in a manner that will not

allow a fall of any distance. A fall restraint system is comprised of a body belt or body harness, an anchorage, connectors, and other necessary equipment. Other components typically include a lanyard, and may also include a lifeline and other devices. Note: A self-retracting lanyard is not appropriate for a fall restraint system unless the worker cannot reach the fall hazard when the lanyard is fully extended. Always follow the manufacturer's instructions or consult a qualified person to ensure proper installation of anchor points. OSHA recommends that fall restraint systems have the capacity to withstand 3,000 pounds of force or twice the maximum expected force that is needed to restrain the worker from exposure to the fall hazard. As a result, fall restraint may be a viable way to provide fall protection in situations in which the employer has concerns about the adequacy of available anchorage points for fall arrest equipment.

### **Guardrails**

Guardrails can be used to protect workers from falling through walls, floor openings or window openings that are 6 feet or higher above a lower level. During multi-story construction, many employers provide fall protection by installing guardrails to exterior wall sections prior to erecting them into place. This ensures perimeter protection before workers begin activities on each floor. Placing joists and adding subfloors can be accomplished while workers are protected from falls.

### **Written Fall Protection Plans**

When working at heights of 6 feet or greater, if the employer does not use ladders, scaffolds, aerial lifts or fall restraint systems and can demonstrate that it is not feasible or would create a greater hazard to use conventional fall protection equipment (guardrails, safety nets or a PFAS), the employer must develop a written site-specific fall protection plan in accord with 29 CFR 1926.502(k). The plan must be prepared by a qualified person. This person could be the owner, the supervisor, or any other worker who has extensive knowledge, training and experience with fall protection and is able to solve problems relating to fall protection. The site-specific fall protection plan must document, for each location, why the use of conventional fall protection equipment is not feasible or will create a greater hazard. The plan must also describe the alternative methods that the employer will use so that workers are protected from falls. Workers and their supervisors must be trained on the proper use of those other fall protection methods.

#### **OSHA Standard:**

##### **29 CFR 1926 Subpart M – Fall Protection**

Available online at:

[www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=STANDARDS&p\\_id=10922](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10922).

OSHA Residential Fall Protection Web Page:

[www.osha.gov/doc/topics/residentialprotection/index.html](http://www.osha.gov/doc/topics/residentialprotection/index.html).

#### **OSHA Compliance Guidance:**

##### **Compliance Guidance for Residential Construction**

– STD 03-11-002 (dated 12/16/2010)

Available online at:

[www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=DIRECTIVES&p\\_id=4755](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=DIRECTIVES&p_id=4755).

**State Plan Guidance:** Twenty-seven states or territories currently operate their own OSHA-approved state plans. State plan workplace health and safety standards must be at least as effective as comparable Federal OSHA standards. State plans have the option of promulgating more stringent standards and, therefore, may have additional requirements for residential

construction. For more information on state plans and their requirements, please visit:

[www.osha.gov/dcsp/osp/statestandards.html](http://www.osha.gov/dcsp/osp/statestandards.html).

**Help for Employers:** OSHA's On-site Consultation Program offers free and confidential advice to small and medium-sized businesses in all states across the country, with priority given to high-hazard worksites. On-site consultation services are separate from enforcement and do not result in penalties or citations. Consultants from state agencies or universities work with employers to identify workplace hazards, provide advice on compliance with OSHA standards, and assist in establishing safety and health management programs. To locate the OSHA Consultation Program nearest you, call 1-800-321-OSHA (6742) or visit: [www.osha.gov/dcsp/smallbusiness/consult.html](http://www.osha.gov/dcsp/smallbusiness/consult.html).

Almost every OSHA area office has a compliance assistance specialist to assist employers in complying with OSHA standards. To find the compliance assistance specialist nearest you, call 1-800-321-OSHA (6742) or visit: [www.osha.gov/html/RAMap.html](http://www.osha.gov/html/RAMap.html).

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