Fall Arrest Save Evaluation Report

Date and Time: 4-9-2012  10:00 am (start at 7:00 am)
Type of Construction: Light Commercial Wood Frame Structure

Fall Incident

The worker was assisting a coworker in moving a roof joist. As the worker was kneeling down over the leading edge, the sheathing fell out from under him and he fell face-first over the edge. The PFAS engaged and pulled him upright before bringing him to a stop.

Additional Details

Ceiling height: 14 feet
Weather: Hot, partly cloudy in the morning clearing by midday. Not considered of any consequence to the incident.
Employee: Age 19, 175 pounds. 1 year experience working in construction
Language: English (USA)
Size of Crew: Seven workers
Time on Task: Nine days working on this particular job site
Training: CFR 1926 Subpart M Fall Prevention training and use of PFAS had been provided.

Fall Prevention Measures

Personnel Lifts were used to access areas and install rafters, beams, etc. Workers in lifts were restrained in accordance with OSHA standards. Ladders used when feasible. Fall restraint systems were used where workers had to perform tasks on ladders when there was possibility of loss of balance. Controlled access zone to restrict area from untrained workers.

Equipment

DBI/ SALA Delta II Unisex Harness

DBI/SALA 30 ft. Ultra Lok™ with 3/16 stainless steel wire rope lanyard

Super Anchor® - Form-It (Previously 3K)

Anchorage Details

Form-It anchor was installed over ½ - inch OSB sheathed over dimensional 2x10 rafters in accordance with manufacturer instructions. The joists at the location of the anchor were fully sheathed in accordance with architectural details provided by the architect and engineer on record.
Incident Scene

Scottsdale, Arizona

Roof pitch: ½ inch per foot “flat” roof

Wall heights: 14 feet – 8 inches to top of deck

Phase of Construction Proximate to Incident

Final phase of joist sheathing installation and minor structural framing adjustments.

Description of How Incident Occurred

There was a witness who watched the entire event while standing three feet in front of the worker. According to the witness, the worker went to the leading edge of the structure to assist with the moving of a roof joist. The two workers were going to remove the joist and reposition it later. According to the worker who fell, he leaned out over the edge and grabbed the joist so that when the nails that were securing the rafter were removed, the rafter would not fall on his coworker. Unfortunately, the rafter was partially supporting the sheathing the worker was kneeling on as he leaned over the edge. Immediately upon the removal of the last fastener, the sheathing beneath the worker broke from his weight. Because he was leaning forward, the worker began falling face-first to the ground below. The following sequence demonstrates the worker’s fall.

Demonstration of fall kinematics

According to the witness and the worker, the PFAS immediately engaged and arrested his fall. The correct positioning of the harness on the worker and its snug fit allowed the system to pull the worker upright just below the roof edge.
After the incident the worker described that his only fear was whether he had his harness fitted correctly, as he knew he was about to have an arrested fall to his pelvic area. According to the worker he was not afraid of falling because he knew he was protected by the PFAS.

The anchor involved in the arrest was photographed three days earlier during a routine safety inspection of the site by company safety personnel. A photo of the anchor before and after is available for this report.

**Rescue**

The worker was immediately rescued by his coworker by the use of the personnel lift on site. After sitting for about 30 minutes, the worker returned to the job.

**Description of Injuries**

No injuries reported.

**Roof System Blueprint/Structural Pages**
Scene Documentation

Figure 1. Demonstration of conditions that occurred to cause fall.
Figure 2. Demonstration of direction of load applied to SRL and anchor. Inset: SRL and anchor three days before incident.

Figure 3. Roof area day after incident. No damage or deflection of roof. No withdrawal of anchor from OSB sheathing.
Load Analysis

Based on the available information, this arrested fall featured the following:

- The worker was crouched down and leaning over the edge of the deck.
- At the time, he had approximately 25 feet of lanyard extended from the SRL.
- When the OSB broke, he pitched forward head first.
- Because the lanyard was attached to the worker’s D-ring, the lanyard was initially angled upward then dropped and laid atop the deck as he fell.
- As the worker pitched off the deck, the lanyard passed over the edge and began to pay out from the SRL.
- The sudden motion caused the SRL to engage and begin to arrest the worker in a line of action from his D-ring back up to the anchor.
- The worker began to slow and his lower body continued to swing down until the worker came to a stop. He was found hanging with his D-ring below the deck.
- Because there was no report of abrasions to the worker’s legs from contact with the roof edge, he was likely clear of the edge when he was arrested.
- It is estimated that the combined free fall and arrest distance was approximately 4 to 5 feet.
- Other than the impact load indicators on the SRL and full body harness showing an impact occurred, examination of the roof deck did not exhibit deformation or any signs an arrested fall had occurred.
- From a height of 14.75 feet, had the worker not been wearing a PFAS, he would have hit the ground at 31 feet per second or 21 miles per hour and most likely in a head down orientation.