CONSTRUCTION
FATALITY DIGEST

QUARTERLY REPORT
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October - December 2018

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Topics of Interest

The Year in Review, 2018
Tenure Study

HASLAM COLLEGE OF BUSINESS
THE UNIVERSITY OF TENNESSEE, KNOXVILLE

CONSTRUCTION INDUSTRY
& RESEARCH POLICY CENTER

"All types of falls (roof, ladder, structure, opening, etc.) accounted for 43.8% (60 events) in the fourth quarter of 2018"

Roof Falls Led All Fatal Events

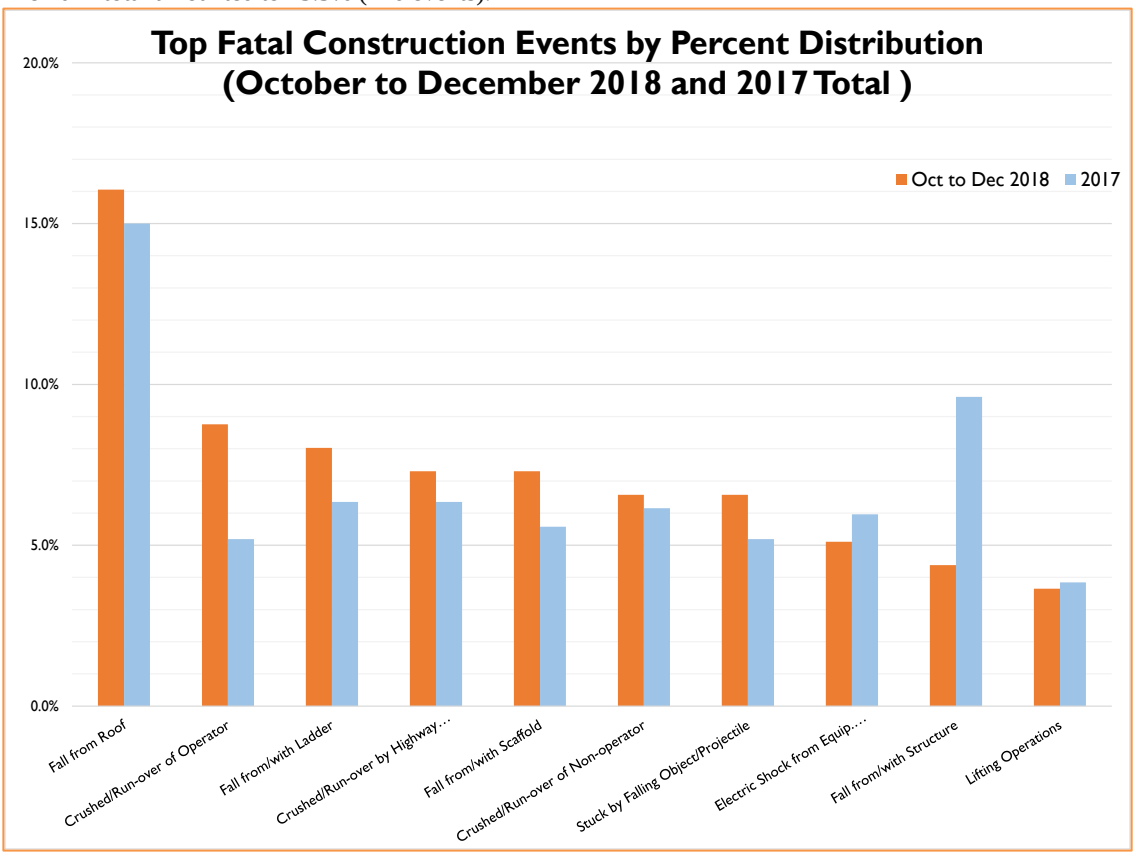
For the fourth quarter of 2018, CIRPC received 137 reports of fatal events in construction. For the most part the pattern of causes remained similar to the results reported for the first three quarters of 2018.

"Fall from Roof" led all categories with 22 events (16.1%) of the 137 events. This is an increase from previous quarter (17 events, 11.5%). For all of 2017 "Fall from Roof" totaled 78 events (15.0%).

"Crushed/Run-over of Operator" was the second leading cause with 12 events (8.8%) followed by "Fall from/with Ladder" with 11 events (8.0%), and "Crushed/Run-over by Highway Vehicle" and "Fall from/with Scaffold" each with 10 events (7.3%).

There were two notable shifts. "Fall from/with Structure" decreased from 8.8% (3rd leading fatal cause for third quarter) to 4.4% for the current quarter. "Crushed/Run-over of Operator" more than tripled from 2.7% (in the previous quarter) to 8.8% for the fourth quarter.

All types of falls (roof, ladder, structure, opening, etc.) accounted for 43.8% (60 events) in the fourth quarter of 2018. This is an increase from 37.8% (56 events) from the previous quarter. The 2017 total amounted to 43.5% (226 events).



Regional Breakdown

Of the 137 events reported for the fourth quarter of 2018, 26.3% came from Region 4 (36 events), 16.1% (22 events) came from Region 5, and 12.4% (17 events) from Region 3. Regions 3, 4, and 5 accounted for 55% of the total.

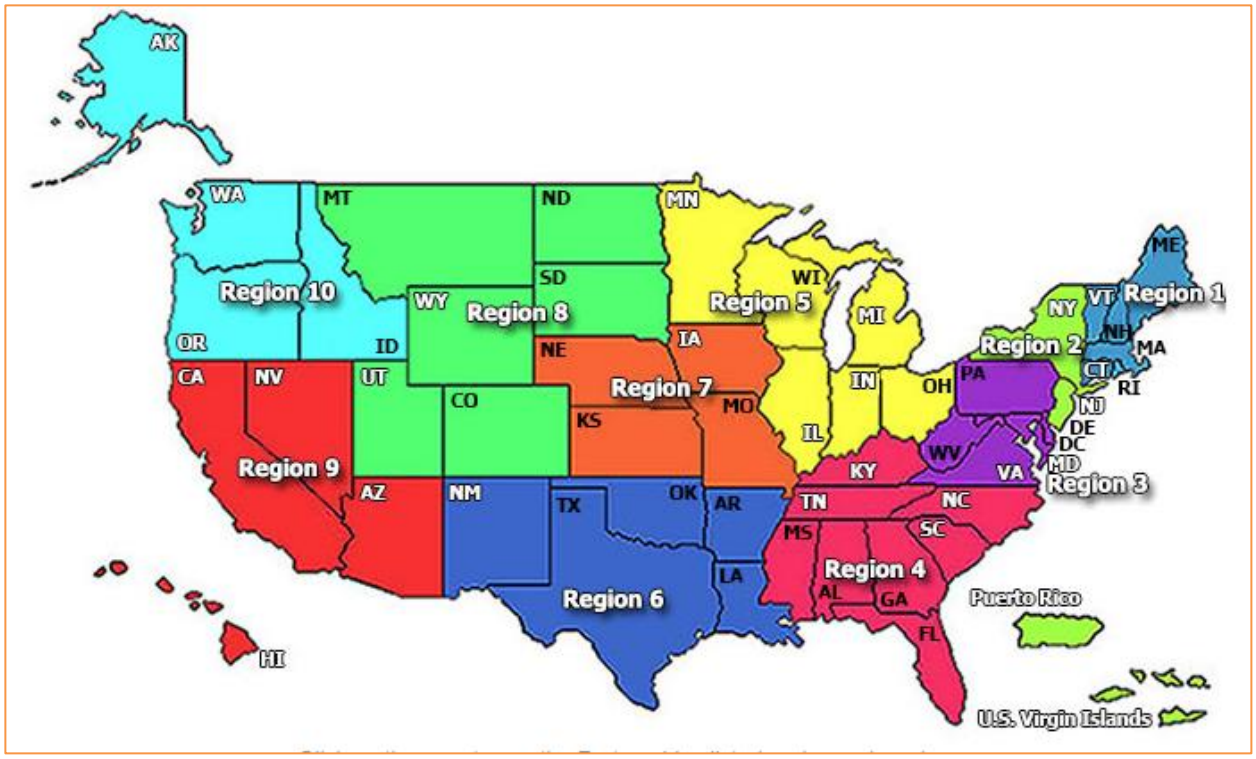
Of these, 60.6% (83 events) were reported from Federal OSHA states, while 39.4% (54 events) occurred in State Plan states.

The breakdown by state revealed California and Florida with the greatest number of events, each with 11 (8.0%), followed by Georgia with 8 (5.8%).

Fatal Events Reported by OSHA Region

October to December 2018

Region	# of Cases	Percent
1	6	4.4%
2	13	9.5%
3	17	12.4%
4	36	26.3%
5	22	16.1%
6	11	8.0%
7	10	7.3%
8	5	3.6%
9	13	9.5%
10	4	2.9%
Total	137	100.0%



Fatal Events by NAICS Code

A breakdown of top reported fatal events by NAICS code shows "Roofing Contractors" at the top with 14.6% (20 events) of the total events. Other top codes are "Highway, Street, and Bridge Construction" contractors with 9.5% (13 events) followed by "Commercial and Institutional Building Construction" contractors with 8.8% (12 events) and "Electrical Contractors" and "Site Preparation Contractors" each with 8.0% (11 events).

Fatal Events by NAICS Code

Code	Description	# of Cases	Percent
238160	Roofing Contractors	20	14.6%
237310	Highway, Street, and Bridge Construction	13	9.5%
236220	Commercial and Institutional Building Construction	12	8.8%
238210	Electrical Contractors	11	8.0%
238910	Site Preparation Contractors	11	8.0%
236115	New Single-Family Housing Construction	6	4.4%
237130	Power and Communication Line and Related Structures Construction	6	4.4%
238120	Structural Steel and Precast Concrete Contractors	6	4.4%
238220	Plumbing, Heating, and Air-Conditioning Contractors	6	4.4%
238990	All Other Specialty Trade Contractors	6	4.4%
237110	Water and Sewer Line and Related Structures Construction	5	3.6%
238290	Other Building Equipment Contractors	5	3.6%
236118	Residential Remodelers	4	2.9%
238320	Painting and Wall Covering Contractors	4	2.9%
238110	Poured Concrete Foundation and Structure Contractors	3	2.2%
238130	Framing Contractors	3	2.2%
238310	Drywall and Insulation Contractors	3	2.2%
236116	New Multifamily Housing Construction	2	1.5%
237990	Other Heavy and Civil Engineering	2	1.5%
238350	Finish Carpentry Contractors	2	1.5%
238390	Other Building Finishing Contractors	2	1.5%
236210	Industrial Building Construction	1	0.7%
237120	Oil and Gas Pipeline and Related Structures Construction	1	0.7%
238140	Masonry Contractors	1	0.7%
238170	Siding Contractors	1	0.7%
238190	Other Foundation, Structure, and Building Exterior Contractors	1	0.7%
		137	100.0%

Top Construction Standard Violations During 2018

For the 517 fatal events we received for 2018, 287 case files reported a total of 1027 violations of OSHA standards. Since inspectors have up to six months to issue citations on a fatality it is likely that additional citations will be forthcoming.

The violations and their frequencies are listed in the table below. The average number of violations per case with citations issued was 3.58. For the three previous calendar years, 2015, 2016, and 2017 the average number of violations per case was 3.24, 3.43, and 3.36 respectively.

The "Fall Protection" standard is the top violation for the year to date with 74 occurrences, followed by "Scaffolding" with 66, "Safety Training and Education" with 53, "and "Reporting Fatalities, Hospitalizations, Amputations, and Eye Loss" with 50 occurrences.

When comparing CIRPC's top 2018 calendar year violations with OSHA's top Fiscal year 2018 standards violated (per www.osha.gov), there are many similarities as might be expected. "Fall Protection", "Hazard Communication", "Scaffolding", "Lockout/Tagout", "Ladders" and "Fall Protection Training" appear in the top standards violated on both CIRPC's and OSHA's list. Those that appear on both lists are marked with an asterisk.

Top OSHA Standard Violations Reported
(January - December 2018)

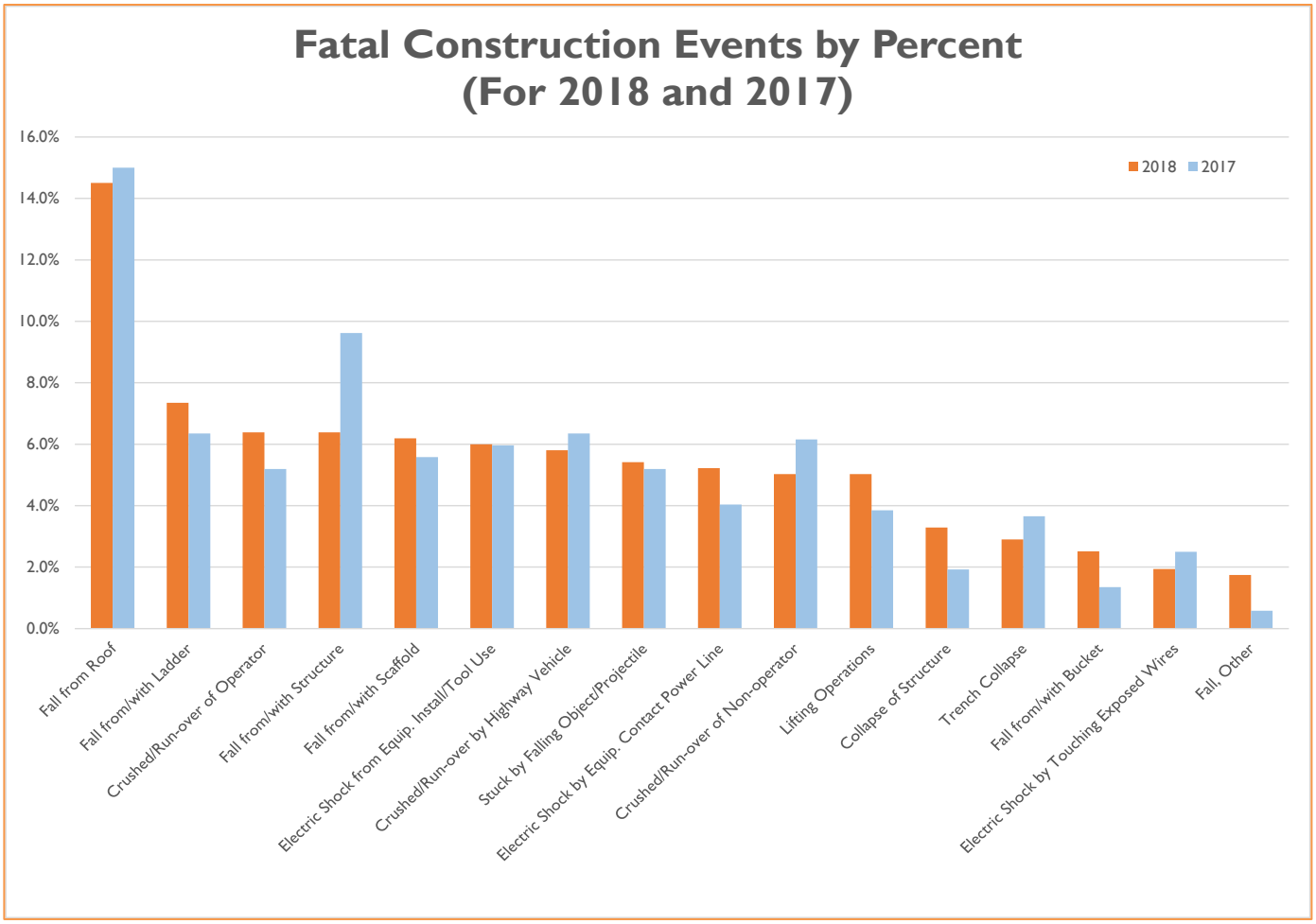
Rank	Std #	Description	# of Occurrences
1	1926.501	Fall Protection*	74
2	1926.451	Scaffolding*	66
3	1926.21	Safety Training and Education	53
4	1904.39	Reporting Fatalities, Hosp., Amputations, and Eye Loss	50
5	1926.503	Fall Protection Training*	40
6	1926.20	General Safety & Health Provisions	39
T7	1910.1200	Hazard Communication*	29
T7	1926.502	Fall Protection Systems Criteria and Practices	29
9	5a1	General Duty Clause	28
T10	1926.416	Electrical, General Requirements	26
T10	1926.651	Excavation	26
12	1926.454	Scaffold Training	24
13	1926.1053	Ladders*	18
14	1910.147	Lockout/Tagout*	17
15	1926.1060	Stairways and Ladders - Training Requirements	15

2018: The Year in Review

There were 517* events reported by OSHA to CIRPC for the calendar year which is a similar to the total of 520 for 2017. In 2018, roof falls led all reported fatal events with 14.5% (75 events) of the total. Roof falls also led all events in the previous four years.

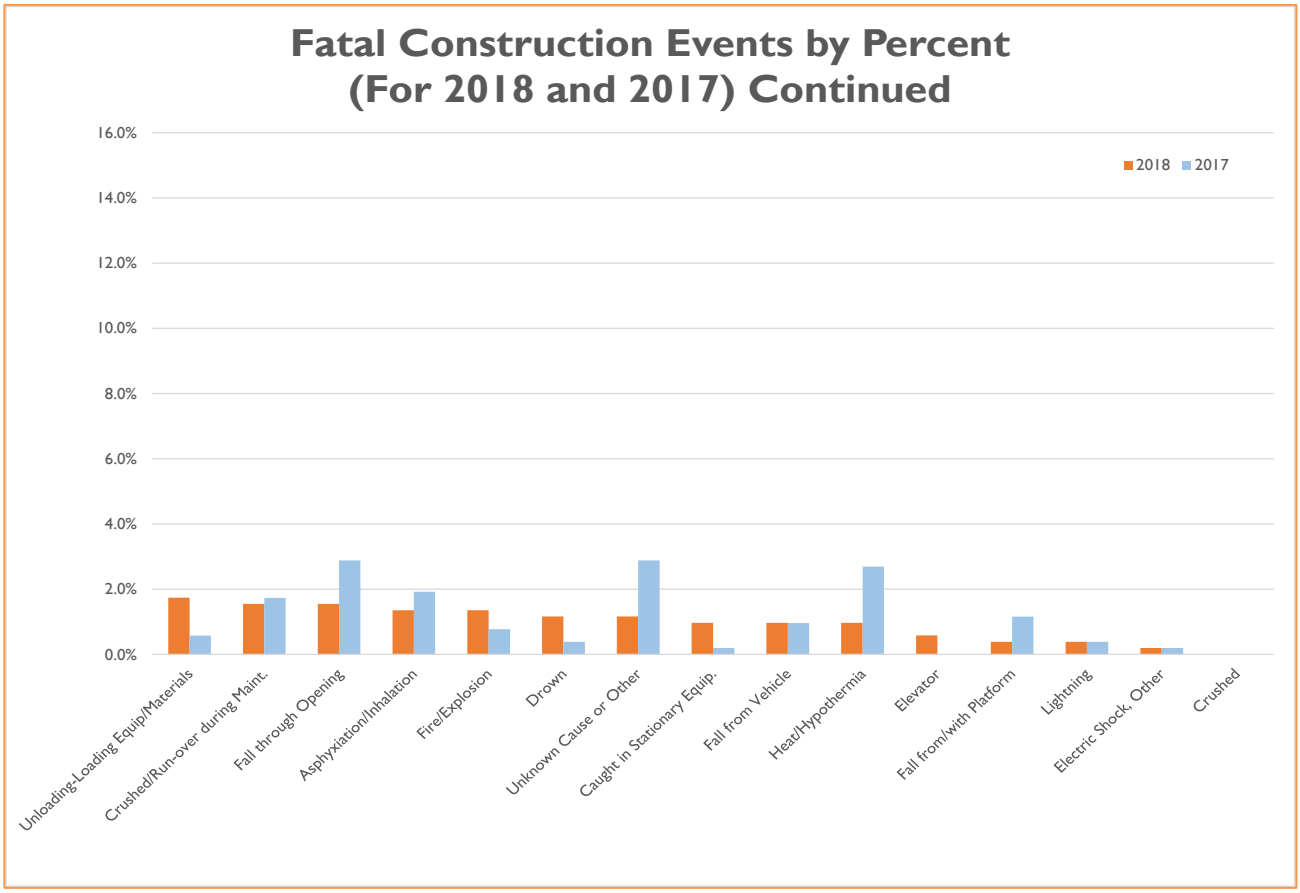
Rounding out the top events for 2018 are "Fall from/with Ladder" with 7.4% (38 events), followed by "Crushed/Run-over of Operator" and "Fall from/with Structure" each with 6.4% (33 events), and "Fall from/with Scaffold" with 6.2% (32 events).

When comparing the fatal events from 2017 with the 2018 events, one can see little ranking changes for the events. "Fall from/with Structure" had the greatest decrease at 3.2% (from 2017 totals). All other events saw minor percent changes (less than 1.8%) from the 2017 totals.



* The 517 events were OSHA jurisdiction cases only and may not total the fatal construction events reported in others sources.

2017: The Year in Review (Continued)



Falls (all types) again topped the list of grouped fatal events with 41.6% of all events in 2018. This was a slight decrease of 1.9% over the total from 2017. Crush/Run-overs (18.8%) and Electrocutions (13.3%) rounded out the top three grouped fatal events. The top three grouped events accounted for almost 75% of all the fatal events in 2018.

Grouped Fatal Construction Events Comparison

Grouped Event	2018	2017	2016
All Falls	41.6%	43.5%	42.3%
All Crush/Run-overs	18.8%	19.4%	20.6%
All Electrocutions	13.3%	12.7%	10.4%
Other Events	26.3%	24.4%	26.7%

CIRPC Tenure Study Sheds New Light on Construction Injuries (Part 1)

Time on the job is often mentioned as an important factor in employee safety. Recently new data on workplace injuries has been developed as a product of grants to several states by the National Institute of Occupational Safety and Health (NIOSH) based on use of workers' compensation records. As a result, we can explore a number of relationships not heretofore possible such as nature, cause, and body part of injury; injury severity; age, sex, and tenure of the injured party.

Additionally, the Construction Industry Research and Policy Center (CIRPC) has received a grant from the Center for Construction Research and Training (CPWR) Small Study Program* to utilize this information on workers' compensation in the context of injuries in construction in Tennessee for the period of 2014-2015. By focusing on the experience of the portion of the workforce experiencing injury rather than on the tenure of the entire workforce, new insights have emerged.

One of the first and perhaps the most notable observation is that a remarkable portion of workers' compensation injuries are experienced by workers reporting limited attachment to the labor force. For the two year period Tennessee under study, 44.5 percent of injuries were sustained by those with a year or less of tenure. For those with tenure of 6 months or less, the percentage is an even more startling 30.1 percent.

If we look at the injuries themselves, whether in terms of type (nature), cause, or body part involved, there is very little difference between the injuries to those with limited tenure and the tenured population as a whole. For example, strain is the leading type of injury overall (31.7 percent), and it likewise accounts for a similar portion of injuries experienced by those with tenure of one year or less (29.3 percent).

Additional findings will be reported in the next issue of Construction Fatality Digest.

* - This study was supported by CPWR through NIOSH cooperative agreement U60-OH009762. Its contents are solely the responsibly of the authors and do not necessarily represent the official views of CPWR or NIOSH.

Summary of Fatal Events

Below is a random selection of 36 fatal event summaries from the 137 cases reported for the quarter. These narratives are taken directly from the reports filed by the OSHA's Certified Safety and Health Officials (CSHOs) with only minor editing. The summaries may be useful in daily safety toolbox talks.

CATEGORY: ROOF FALLS

Inspection Number: 1402908
The victim was making repairs to an existing roof due to a leak around the chimney. The victim was transitioning from the roof on the single family home to an extension ladder. The employee lost his balance and fell approximately 18 feet onto a stone patio.

Inspection Number: 1407571
The victim was removing snow from a roof so a leak could be repaired. He was walking across the roof to grab a repair part. As he was walking, he stepped through a skylight that was obscured by snow. He fell 15-20 feet hitting objects on the way down which oriented him to fall head first to the concrete surface below. He died on scene.

Inspection Number: 1391418
Employee was engaged in removing old sheet metal roofing and installing new roofing planks. Employee was walking to get his tools when the piece of sheet metal roofing he was walking on gave way, causing him to fall 23 feet to the concrete floor below.

Inspection Number: 1394456
An ATV was used to move material on the roof. The victim drove the ATV off the roof.

Inspection Number: 1391992
An employee was working on a 6/12 pitched roof to install shingles on a newly constructed assisted living home. The employee used a lift to get onto the roof and then had to climb another 30 feet to the peak of the roof to connect to his retractable lanyard. The employee was at the peak of the roof when he slipped on the icy roof, sliding down the roof, and the falling 32 feet to the ground below.

CATEGORY: OTHER FALL EVENTS

Inspection Number: 1407696
The victim was cleaning gutters when he was discovered on the ground approximately 15 feet away from where his ladder was set up. There were no witnesses to the fall. The victim suffered a brain injury that continued to hemorrhage and ultimately resulted in his death two days later.

CATEGORY: OTHER FALL EVENTS (Continued)

Inspection Number: 1406755
Employer and employee were hanging Christmas lights at a residential home. The employee lost his balance and fell from the ladder onto a concrete surface.

Inspection Number: 1397685
The victim was installing crown molding at a residential home. He was later found on the floor from an apparent fall from a step ladder. He had suffered a broken neck.

Inspection Number: 1395747
An employee fell from a raised vehicle bed as it traveled in reverse. The employee was struck by the vehicle and killed.

Inspection Number: 1413922
The worker was climbing the scaffold, when he lost his balance and fell into the space between the building and the scaffold.

Inspection Number: 1397948
An employee was working in a man lift. He disconnected his fall protection from the lift and connected to telecommunications equipment that was attached to water tower. The employee fell out of lift and the telecommunications equipment failed to support the employee's weight causing the equipment to detach from the tower. This caused the employee and the equipment to fall to the ground.

Inspection Number: 1388447
An employee was drilling holes into a steel beam 45 feet above the ground. He was not tied off to an anchorage point. He lost his balance and fatally fell to the ground below.

Inspection Number: 1412391
The victim was conducting field measures and counting trusses on a jobsite. He tripped and fell (from a truss) hurting his hip. The supervisor was contacted and told the victim to go to the doctor and be evaluated. The hospital sent him home and was found unconscious in his home a number of days later. He then was taken back to the hospital where he was notified that he had broken his ribs and was bleeding internally. He then went into a coma and ended up passing away later that day.

Inspection Number: 1415276
The worker was leaning over a 40 inch deep trench. The worker lost his balance and fell, fatally striking his head on the lip of the opposite side of the trench.

CATEGORY: ELECTROCUTIONS

Inspection Number: 1395463
A 35 year old male employee was moving a shingle transport/aluminum ladder. The ladder made contact with live electrical wires running in front of the house. The employee was electrocuted.

Inspection Number: 1389306
Two victims were electrocuted when the boom and hose of their concrete pump truck contacted the overhead power lines.

Inspection Number: 1388871
An employee was assisting an operation to drive a grounding rod into the ground. The rod made contact with live 277v line after it penetrated an underground conduit. The employee holding the ground rod at the time and was electrocuted.

Inspection Number: 1408497
The victim was doing demolition of ceiling tile and grid from a ladder. He was disconnecting a light fixture while standing on a 10 foot ladder (at the 8 foot level). He had successfully disconnected 8 light fixtures prior to this one. He used a tester to determine that it was "hot"(energized). He proceeded to disconnect using caution. In the process he was shocked causing him to fatally fall head first onto the tile floor.

CATEGORY: STRUCK BY, RUN OVER, CRUSHED BY OPERATING CONSTRUCTION EQUIPMENT/VEHICLE

Inspection Number: 1410185
Employee was standing next to an excavator while the operator was maneuvering the bucket. The operator could not see the employee and was being directed by the foreman to move the bucket back approximately 2 feet. During this operation, the bucket hit the employee in the chest/abdomen area.

Inspection Number: 1395768
An employee was run over by a dump truck that was being pushed by a front end loader. The dump truck was unoccupied and the employee was standing in front of the dump truck when the front end loader began pushing.

Inspection Number: 1388789
Employee/owner was doing contracted work (installing security camera) at a grocery store, when he fell on the controls of a scissor lift that he was operating. This caused the lift to raise upward and pin him against the ceiling causing the fatal injury.

CATEGORY: STRUCK BY, RUN OVER, CRUSHED BY OPERATING CONSTRUCTION EQUIPMENT/VEHICLE (Continued)

Inspection Number: 1397832
Helicopter pilot was transporting personnel to three existing H-frame power lines. After the drop off, the helicopter struck a newly set pole, causing the helicopter to crash.

Inspection Number: 1394811
A grounds man working with another employee as part of a hurricane Michael power restoration crew were standing 25 feet off of a state road in the grass. A truck with trailer in tow drove off the road and struck them. One employee passed away at the scene and 2 others were injured and hospitalized which lead to another employee passing away.

Inspection Number: 1404808
A 45 year old concrete finisher, was struck by a vehicle at a highway construction site. He was finishing concrete while constructing a turning lane near an intersection. A vehicle entered the construction zone travelling approximately 80-90 mph and struck the arrow board and flipped on its side. The vehicle continued to travel east bound and struck the finisher. He was deceased on the scene.

Inspection Number: 1389044
Two employees were sampling soils on the east bound lanes, when a pickup pulling a trailer was rear-ended by a large truck. The trailer spun into the construction lane striking the two workers. One worker was pronounced dead at the scene.

CATEGORY: OTHER FATALITY CAUSES

Inspection Number: 1402126
The employee was working inside an enclosed trailer with an operating gas generator. He came out of the trailer sat down and told another employee he didn't feel good. He collapsed; EMS was called. He did not recover and passed away due to high carbon monoxide levels in his system.

Inspection Number: 1391158
An HVAC employee was performing work on a high velocity ventilation exhaust system. The employee opened the door to the roof top unit (which was running) and was sucked into (entrapped) in the fan unit.

Inspection Number: 1389609
Employees seeking shelter from the rain and wind were injured when the wood-frame residential structure under construction collapsed during windy conditions.

CATEGORY: OTHER FATALITY CAUSES (Continued)

Inspection Number: 1394802
Two employees were working inside of an elevator shaft on top of an elevator car. They were installing angle irons for counterweight guards. The elevator adjacent to the employees was in normal operation and being used by the hospital. While this elevator was going up, its counterweight was traveling down. The victim was clipped in the back of the head by the counterweight.

Inspection Number: 1401050
The victim was working a tag line on a hoisted truss when the truss became dislodged from the lifting apparatus. The truss fell 8 feet, striking the victim in head.

Inspection Number: 1390959
Two employees were working on a suspended scaffold on the 12th floor of a building, when a coping stone became dislodged from the 20th floor and fell, striking both employees. One employee died at the hospital and the second employee had minor injuries.

Inspection Number: 1388748
A laborer was attempting to "break" sections of pipe at the receiving end of a road boring operation. The driller, who was positioned approximately 840 feet away, asked the laborer if he could push 6 additional inches and the laborer gave the go ahead. Unbeknown to the driller, the laborer had placed a 40 inch wrench on the pipe. The driller pushed the pipe and the rotation caused the wrench to swing and strike the laborer in the forehead, killing him.

Inspection Number: 1398862
The victim was using a portable saw when it kicked back and sliced his neck. He was transported to the hospital where he passed away.

Inspection Number: 1395734
Employee was working behind a dump truck when the tailgate came down and fatally crushed his head.

Inspection Number: 1412245
An employee was working on connecting a water utility line and installing a manhole when he stepped outside the trench box to perform an unknown task. The unsupported excavation collapsed on to the employee and fatally buried him.

Inspection Number: 1390832
The employee was on a flatbed trailer moving an I-beam with a pry bar. It is suspected that when the employee moved the I-beam it spun. The employee was knocked over and then fell to the ground. The moving I-beam fell off of the flat bed and onto the employee trapping him beneath it. The employee was killed at the scene.

Get Ready for Safe + Sound 2019

Safe + Sound, OSHA's year-round campaign to encourage every workplace to have a safety and health program, includes both employers and workers. Participate in quarterly events on building an effective safety and health program in your workplace. Learn about best practices during webinars and put them into action during the 30-day challenges. These events also focus on management leadership, worker participation, and finding and fixing hazards. Share your safety successes during Safe + Sound Week, August 12-18, 2019. Sign up on the Safe + Sound website (www.osha.gov/safeandsound)

(Information courtesy of OSHA)

We can be contacted at:
Construction Industry Research and Policy Center
The University of Tennessee
Stokely Management Center, Room 202
916 Volunteer Boulevard
Knoxville, Tennessee 37996
Phone: 865-974-4422
E-mail: cirpc@utk.edu

Visit our website!
cirpc.haslam.utk.edu

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We would like to thank OSHA's Dave Schmidt for help in obtaining the data used in this newsletter. Comments and suggestions can be directed to John Wagner (jpwagner@utk.edu) as we work together to contribute to a safer construction workplace.