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Data Bulletin

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Fatal Injury Trends in the Construction Industry, 2011-2022

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OVERVIEW

Construction is one of the most hazardous industries in the United States: in 2022, its workers accounted for 19.9% of all on-the-job fatal injuries but only 7.5% of employment. *Private industry* construction had a fatal injury rate 2.5 times higher than all industries (9.6 versus 3.9 per 100,000 *full-time equivalents [FTEs]*), which was the third highest in the country. This Data Bulletin examines fatal occupational injuries and at-work deaths in construction by *major subsector*, occupation, demographics, *primary source*, *event/exposure*, and *cause-of-death*. In addition, we identified the most frequently words in fatal injury narratives to examine trends.

Fatal injury estimates used two data sources: 1) U.S. Bureau of Labor Statistics (BLS) Census of Fatal and Occupational Injuries (CFOI) for charts 1 to 8, and 2) CPWR Construction Fatality Map data for charts 9 and 10. CFOI fatal injury estimates were obtained from the public tool, with the exception of Chart 3, which uses a CFOI published table. CPWR's Construction Fatality Map data is publicly available on CPWR's website. CFOI covers all fatal work injuries, while the Construction Fatality Map data includes fatalities in OSHA Fatality Reports and media reports. For charts 11 and 12, which examine causes of death for at-work deaths among those usually employed in construction 16 to 64 years old, data come from the National Center for Health Statistics National Vital Statistics System (NVSS) Mortality Multiple Cause-of-Death data. NVSS data does not capture employment status (full-time, unemployed, retired, etc.) at time of death. Construction workers are defined in NVSS data as those whose usual industry was construction, including individuals currently employed, retired, or no longer in the workforce. All three data sources cover fatalities occurring at work but differ on reporting requirements and available injury information. FTEs were obtained using the Current Population Survey (CPS), a monthly population survey, downloaded through IPUMS. Fatal injury *rates* were calculated per 100,000 FTEs.

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THIS ISSUE

This issue reports trends on fatal injuries using three data sources, examining fatal injuries by major subsector, occupation, demographics, primary source, event/exposure, cause of death, and state, in addition to information reported in injury narratives.

KEY FINDINGS

From 2011 to 2022, the number of fatal injuries increased 39.8% while the rate increased 3.3%.
Chart 1

Fatal injuries largely occurred among males (99.0%). Older workers (55 years or older) accounted for 31.1% and Hispanic workers accounted for 37.4% of fatal injuries in 2022.
Charts 4-6

Roadway incidents involving a vehicle accounted for 13.9% of fatal injuries in 2022.
Chart 8

Falls were mentioned nearly 4,000 times in CPWR Fatality Map narratives reviewed, with roofs and/or ladders mentioned over 2,500 times.
Chart 9

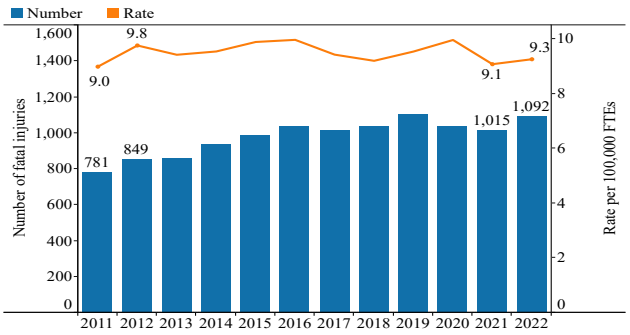
The third leading detailed cause of death at work was accidental poisoning by and exposure to narcotics and hallucinogens, accounting for 6.3% of at-work deaths in 2022.
Chart 11

NEXT DATA BULLETIN

Mental Health Trends in Construction

From 2011 to 2022, 11.7 thousand (K) construction workers died from an on-the-job injury (chart 1). On average, there were 978 fatal injuries annually, with a rate of 9.5 deaths per 100,000 FTEs. During this period, the number of injuries increased 39.8% (781 to 1,092), while the rate increased 3.3% (9.0 to 9.3 per 100,000 FTEs). From 2021 to 2022, fatal injuries increased 7.6% (1,015 to 1,092), while the rate increased 2.2% (9.1 to 9.3 per 100,000 FTEs).

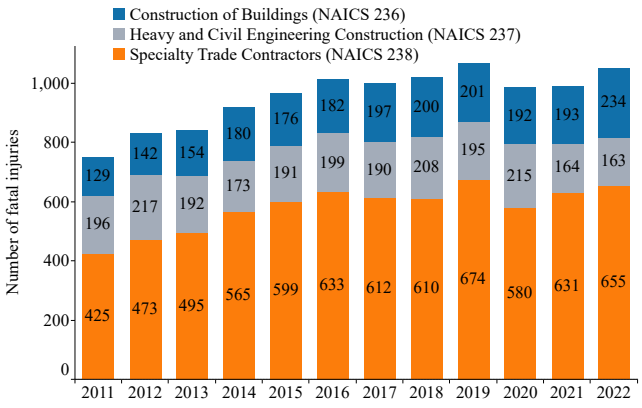
1. Fatal injuries by year, 2011-2022



Source(s): *U.S. Bureau of Labor Statistics, 2011-2022 Census of Fatal Occupational Injuries and 2011-2022 IPUMS Current Population Survey.*

For fatal injuries with a reported major subsector in construction, 60.8% were among workers in Specialty Trade Contractors (NAICS 238), 20.1% were among those in Heavy and Civil Engineering Construction (NAICS 237), and 19.1% in Construction of Buildings (NAICS 236) from 2011 to 2022; (chart 2). For context, in 2021 63.6% of payroll establishments were Specialty Trade Contractors (NAICS 238), 31.3% were Construction of Buildings (NAICS 236), and 5.0% were Heavy and Civil Engineering Construction (NAICS 237).

2. Fatal injuries by major subsector and year, 2011-2022*

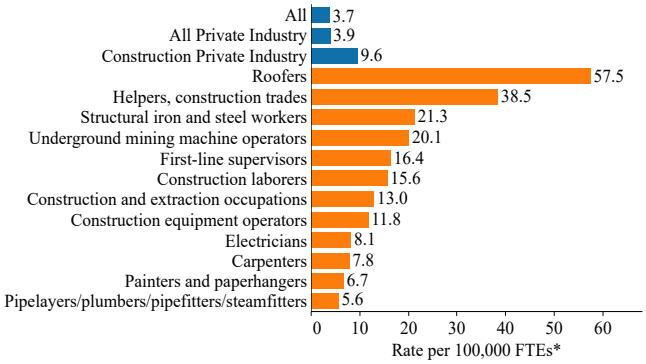


Source: *U.S. Bureau of Labor Statistics, 2011-2022 Census of Fatal Occupational Injuries.*

**Totals may not match chart 1 due to available subsector data.*

Fatal injury rates for select *construction and extraction occupations* among all industries in 2022 were examined (chart 3; note: data is for construction and extraction occupations not necessarily specific to the construction industry). After transportation and material moving, construction and extraction occupations had the second highest number of fatal injuries (n=1,056) in 2022. Among these occupations, the three highest rates (per 100,000 FTEs) were roofers (57.5), helpers (38.5), and structural iron and steel workers (21.3). From 2020 to 2022,the roofer fatality rate increased 22.3%, while rates decreased 11.1% among helpers and 34.5% among structural iron and steel workers (2020 data previously published).

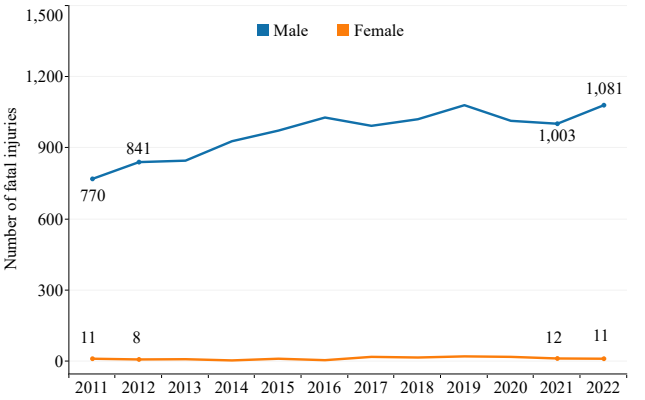
3. Rate of fatal injuries in construction and extraction occupations, 2022



Source: *U.S. Bureau of Labor Statistics, Hours-based fatal injury rates by industry, occupation, and selected demographic characteristics, 2022, https://www.bls.gov/iif/fatal-injuries-tables/fatal-occupational-injuries-hours-based-rates-2022.xlsx.*

From 2011 to 2022, there were on average 12 fatalities annually among women with little variation year to year, while fatal injuries increased 40.4% (770 to 1,081) among males (chart 4). Males accounted for 99.0% of fatal injuries in 2022 (n=1,081). From 2021 to 2022, fatal injuries among men increased 7.8% (1,003 to 1,081), while there was an 8.3% reduction in fatal injuries for women (12 to 11; interpret with caution due to the limited number of injuries).

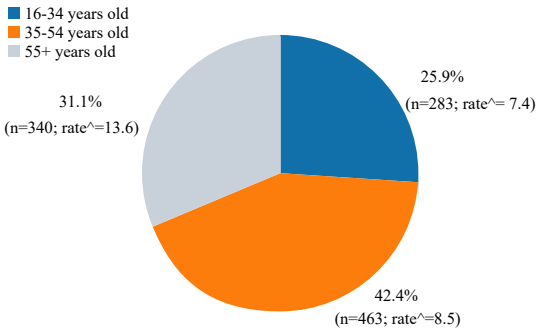
4. Number of fatal injuries in construction by sex, 2011-2022



Source: *U.S. Bureau of Labor Statistics, 2011-2022 Census of Fatal Occupational Injuries.*

Next, fatal injuries in 2022 were analyzed by age group (when there was reported data; chart 5). The majority of fatalities occurred in construction workers 35 to 54 years old (n=463; 42.4%), followed by those who were 55 years or older (n=340; 31.1%) and 16 to 34 years old (n= 283; 25.9%). Workers 55 years or older had the highest rate (13.6 per 100,000 FTEs) which was 1.6 times higher than those 35 to 54 years old (8.5) and 1.8 times higher than those 16 to 34 years old (7.4).

5. Percentage of fatal injuries in construction by age group*, 2022



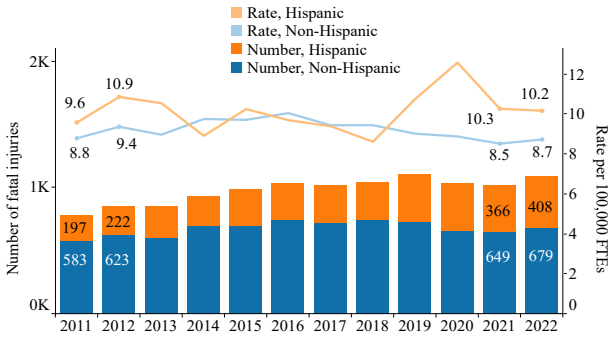
Source: *U.S. Bureau of Labor Statistics, 2011-2022 Census of Fatal Occupational Injuries and 2011-2022 IPUMS Current Population Survey.*

**Total annual fatal injuries may not sum to industry total due to missing data.*

^Fatal rates are calculated per 100,000 FTEs.

From 2011 to 2022, fatal injuries among Hispanic construction workers increased 107.1% (197 to 408), while the rate increased 6.3% (9.6 to 10.2 per 100,000 FTEs) (chart 6). Among non-Hispanics, the number of fatal injuries rose 16.5% (583 to 679), while the rate decreased 1.1% (8.8 to 8.7 per 100,000 FTEs). In 2022, 37.4% of the 1,092 fatal injuries shown in chart 1 occurred among Hispanics (n=408). That year, the rate among Hispanic construction workers was 1.2 times higher than that of non-Hispanic workers (10.2 versus 8.7 per 100,000 FTEs). The BLS reported that the construction industry accounted for 38.9% of foreign-born Hispanic or Latino worker deaths in 2022.

6. Number and rate of fatal injuries in construction by ethnicity*, 2011-2022

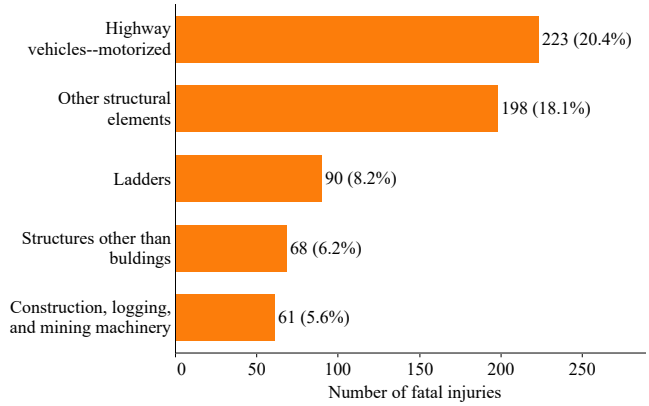


Source: *U.S. Bureau of Labor Statistics, 2011-2022 Census of Fatal Occupational Injuries and 2011-2022 IPUMS Current Population Survey.*

**Total annual fatal injuries may not sum to industry total due to missing data.*

Fatal injuries in construction by selected primary source (e.g., factor responsible for injury) were then examined (chart 7). In 2022, highway vehicles-motorized, a common source of transportation injuries, was the leading primary source, accounting for 20.4% (n=223) of all fatal injuries. Other structural elements–which include parts of buildings or structures (e.g., doors, roofs, ceilings, elevator shafts)–was the second leading source, accounting for 18.1% (n=198) of fatal injuries. Ladders, a common source of falls, accounted for 8.2% (n=90) of fatal injuries.

7. Fatal injuries in construction by selected primary sources*, 2022

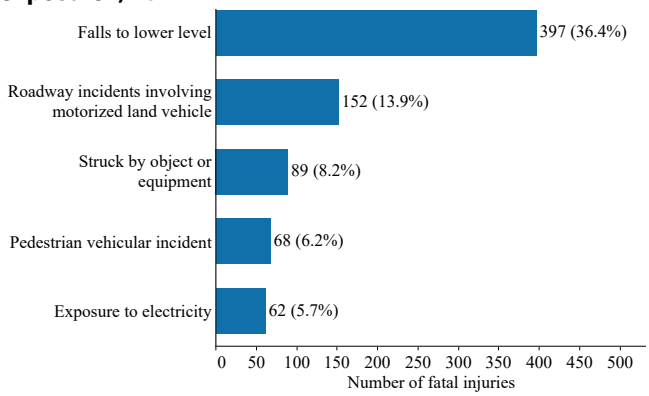


Source: *U.S. Bureau of Labor Statistics, 2022 Census of Fatal Occupational Injuries.*

**Sources are limited to two-digit OIICS codes.*

An analysis of the event/exposures of fatal injuries in construction found *falls to lower level* were the most common, accounting for almost 40% of fatal injuries in 2022 (36.4%; n=397) (chart 8). The second most common were *roadway incidents involving a vehicle*, comprising 13.9% of fatal injuries (n=152). *Struck by object or equipment* (8.2%; n=89) was the third leading event/exposure.

8. Fatal injuries in construction by selected event or exposure*, 2022



Source: *U.S. Bureau of Labor Statistics, 2022 Census of Fatal Occupational Injuries.*

**Event and exposures limited to two-digit OIICS codes.*

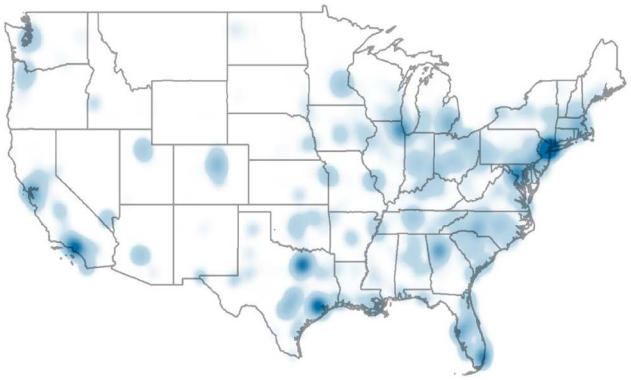
Chart 9 is a word cloud showing the words most frequently used to describe the worker or injury in the 7,412 narratives from 2011 to 2023 reviewed in CPWR's Construction Fatality Map Dashboard. From 2011 to 2023, *employee-terms* were used the most often in these narratives, 12,114 times (frequency data not shown). *Fall-terms* were the next top *word category*, appearing 3,884 times. Two words related to falls were common: *roof-terms*, 1,550 times and *ladder-terms*, 1,016 times. This aligns with data on fatal injuries reported in CFOI which shows the most common event/exposure are falls, slips, and trips as seen in chart 8.

9. Words commonly found in fatality narratives, 2011-2023

Source: *CPWR- the Center for Construction Research and Training, 2011-2023 Construction Fatality Map Dashboard.*

Fatalities spanning 2011-2023 from the Construction Fatality Map Dashboard were examined to highlight locations in the continental U.S. with higher *densities* of recorded fatalities (chart 10). Cities which had higher-than-average densities or concentrations of construction fatalities were San Diego, Los Angeles, Dallas, Austin, Miami, Tampa, and New York City. These cities align with the top states for number of fatal injuries in construction.

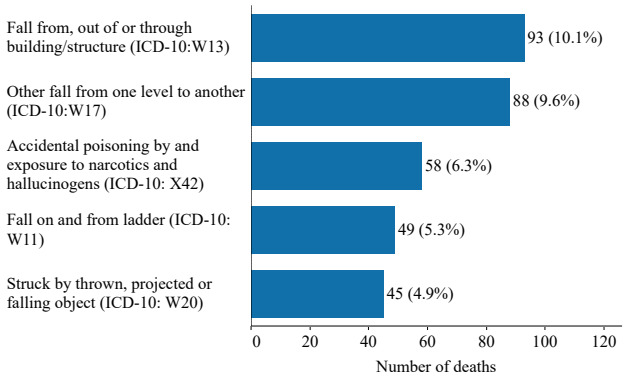
10. Heat map of construction fatalities in the continental U.S., 2011-2023



Source: *CPWR- the Center for Construction Research and Training, 2011-2023 Construction Fatality Map Dashboard.*

Next, deaths at work captured in NVSS mortality data were examined (charts 11 to 12). Four of the top five *detailed causes of deaths* were injuries, including falls and struck-by injuries, while the fifth category was *overdose*-related (chart 11). The leading cause of at work deaths among construction workers 16 to 64 years old was falls from, out of, or through a building or structure (n=93; 10.1%), followed by other falls from one level to another (n=88; 9.6%), and accidental poisoning by exposure to narcotics and hallucinogens (n=58; 6.3%; note: this is one of 20 ICD-10 codes used to define an overdose death).

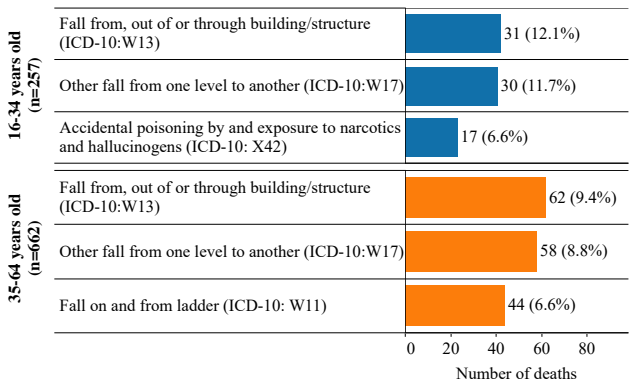
11. Top 5 detailed causes of death among construction workers 16-64 years old at work, 2022



Source: *National Center for Health Statistics, 2022 Mortality Multiple Cause File.*

Detailed causes of deaths at work were then examined by age (chart 12). Cause of death for workers aged 16 to 34 years old were similar to those for all construction reported in chart 11, with a slightly higher percentage of falls from, out of or through building structure (n=31; 12.1%) and other falls from one level to another (n=30; 11.7%). The third leading cause of death for those 16 to 34 years old was accidental poisoning by and exposure to narcotics and hallucinogens (n=17; 6.6%). The top three detailed causes of death for workers aged 35 to 64 years old involved falls.

12. Top 3 detailed causes of death among construction workers 16-64 years old at work by age group, 2022



Source: *National Center for Health Statistics, 2022 Mortality Multiple Cause File.*

In 2022, construction was one of the top five industries for fatal injuries. From 2021 to 2022, the number of fatal injuries in construction increased 7.6%, while the rate increased 2.2%. Understanding the type of injuries occurring and who suffers these injuries is important, as this information can be used to guide prevention efforts.

All data sources examined found falls were a leading cause of fatal injuries, including 1) falls, slips, and trips accounted for 40% of fatal injuries in 2022, 2) "fall" and "fell" were used 3,884 times in CPWR Fatality Map narratives, and 3) the leading cause of death of construction workers at work were fall from, out of or through building or structure (ICD-10: W13). CFOI data showed roofers had the highest rate among selected occupations with 57.5 fatal injuries per 100,000 FTEs. Fatality Map narratives also found roof-terms were used 1,550 times.

Roadway incidents involving motorized land vehicles were the second most common event/exposure of fatal injuries among construction workers accounting for 13.9% of fatalities. In comparison, the BLS reported that for all industries, transportation incidents were the most common event/exposure for all fatal injuries.

The National Safety Council reports the construction industry had the largest number of preventable (e.g., could be eliminated as they do not result from natural causes) fatal injuries in 2022. Effective planning can be used to improve worker safety and health. CPWR has many planning tools and resources for contractors that can be used during the pre-construction phase and before conducting each task. Fall-specific planning resources and a struck-by prevention planning program are also available. CPWR, OSHA, and NIOSH provide hazard-specific resources for the industry.

ACCESS THE CHARTS & MORE

View the charts in PowerPoint and the data underlying the charts in Excel. Downloading will start when you click on each link. These files can also be found under the Data Bulletin at: https://www.cpwr.com/research/data-center/data-reports/.

DEFINITIONS

- ***Cause of death*** *– the specific condition that caused the death based on the International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) diagnosis Code.*
  - ***Detailed cause of death*** *– the specific ICD-10-CM Code. See: World Health Organization's ICD-10 Tool.*
- ***Density*** *– concentration or intensity within a given area used to examine the distribution of fatal injuries.*
- ***Event or exposure*** *– the manner in which the injury or illness was produced or inflicted, such as fall, heat-related illness, etc. Definitions and examples can be found in the Occupational Injury and Illness Classification Manual.*
  - ***Construction and Extraction Occupations*** *– Defined as occupations under 47-0000. These occupations may work outside of the construction industry. For example, Excavating and Loading Machine and Dragline Operators (47-5022) top two industries for employment are 1) Mining, Quarrying, and Oil and Gas Extraction and 2) Construction.*
  - ***Falls to a lower level (OIICS 43)*** *– Injury caused by impact between a falling person and lower surface (e.g., fall from a roof to a ground level; fall from a ground level into an opening or body of water; fall from a collapsing structure).*
  - ***Roadway incidents involving a vehicle (OIICS 26) –*** *The full category name is roadway incidents involving motorized land vehicles which are injuries involving these vehicles that occur on a public highway, street, or road normally used for travel.*
  - ***Struck-by object or equipment (OIICS 62) –*** *Injury in which a person is struck by an object or equipment.*
- ***Full-time equivalent workers (FTEs)*** *–*
  - *Chart 1 based on hours worked in the CPS date. Full-time defined as 2,000 hours per year.*
  - *Chart 3 uses total hours worked in employer logs.*
- ***Major subsector*** *– 3-digit NAICS codes within construction.*
- ***Overdose*** *– A death with one of the following ICD-10 codes: X40–X44, X60–X64, X85, and Y10–Y14.*
- ***Primary source*** *– the objects, substances, equipment, and other factors that were responsible for the injury or illness incurred by the worker. For example, a worker who was climbing up a ladder when they slipped and fell would have a reported primary source of, "Ladders." For more details see: Occupational Injury and Illness Classification Manual.*
- ***Private industry*** *– employment in businesses owned by an individual, excludes government employees.*
- ***Rates*** *–*
  - ***All charts (except chart 3)*** *– calculated by dividing injuries by the number of full-time equivalents for the time period then multiplying by 100,000.*
  - ***Introduction and Chart 3*** *– BLS calculates the rate per 100,000 FTEs as Number of Fatal Injuries/Total Hours Worked X 200,000,000.*
- ***Word category*** *– groupings of words based on a common word root.*
  - ***Employment-terms*** *– workers who work for individuals or private companies.*
  - ***Fall-terms*** *– includes fell and fall(s).*
  - ***Ladder-terms*** *– includes ladder(s) and stepladder(s).*
  - ***Roof-terms*** *– includes roof(s) and rooftop.*
  - ***Truck-terms*** *– includes truck(s).*
  - ***Work-terms*** *– includes work, worked, and working.*

DATA SOURCES

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- Construction Safety and Health Network
  https://safeconstructionnetwork.org/
- Construction Solutions
  https://www.cpwrconstructionsolutions.org/
- Construction Solutions ROI Calculator
  https://www.safecalc.org/
- COVID-19 Construction Clearinghouse
  https://covid.elcosh.org/index.php
- COVID-19 Exposure Control Planning Tool
  https://www.covidcpwr.org
- Electronic Library of Construction Occupational Safety and Health
  https://www.elcosh.org/index.php
- eLCOSH Nano
  https://nano.elcosh.org/
- Exposure Control Database
  https://ecd.cpwrconstructionsolutions.org/
- Nano Safety Data Sheet Improvement Tool
  https://nanosds.elcosh.org/
- Safety Climate - Safety Management Information System (SC-SMIS)
  www.scsmis.com
- Stop Construction Falls
  https://stopconstructionfalls.com/
- Work Safely with Silica
  https://www.silica-safe.org/

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