State of California
Department of Industrial Relations
Occupational Safety and Health Standards Board

Petition File No. 616

Board Staff Evaluation
Submitted by Maryrose Chan, Safety Engineer

July 30, 2026

State of California

Gavin Newsom, Governor

INTRODUCTION

On June 29, 2026, Greg Small, PE, a Fall Protection Qualified Person instructor and subject matter expert on fall protection, submitted a petition to oshsb@dir.ca.gov concerning helmet protection for employees working at height.

REQUESTED ACTION

The petitioner requests the Board to consider amending applicable title 8 regulations to require all employees who are using active fall protection systems to wear Type II helmets that meet American National Standards for Industrial Head Protection, ANSI Z89.1-2014.

PETITIONER'S ASSERTIONS

- The head is one of the most vulnerable parts of the human body. Brain injuries do not heal as readily as injuries to other parts of our bodies. Unlike bone, muscle and tendons (which can often completely recover from serious cuts, breaks, tears and punctures), brain tissue does not regenerate. At best, other parts of the brain attempt to partially take over functions lost by the injured part of the brain and are much less effective than the injured brain had been before the injury.
- The greatest risk of head injury when using a fall arrest system is prior to full engagement of the fall arrest system. This occurs during and slightly beyond the Free Fall phase of the fall event. When a worker is tumbling, the head can easily strike objects even if the fall is arrested. Once the fall arrest system is engaged, the body quickly is jerked upright so that the feet are leading the fall and will impact the ground or lower obstruction first, effectively dissipating the fall energy into the strongest parts of our body, shielding and usually preventing appreciable impact energy being delivered to the head.
- Statistics from Australia show that 75% of fall fatalities involve fatal head injuries.
- UK fatalities from falls are about 20% of those recorded in the US (per man-hours worked). Although not discussed at the meeting as a possible reason, a key difference between the US and the UK (and many other countries around the world) is that US workers wear construction hard hats instead of helmets and thus have significantly less reliable head protection. This alone might explain a significant portion of the difference in fatality statistics between the US and the UK.
- US OSHA issued Safety and Health Information Bulletin "SHIB 11-22-2023", recommending the use of Helmets in ALL construction work.

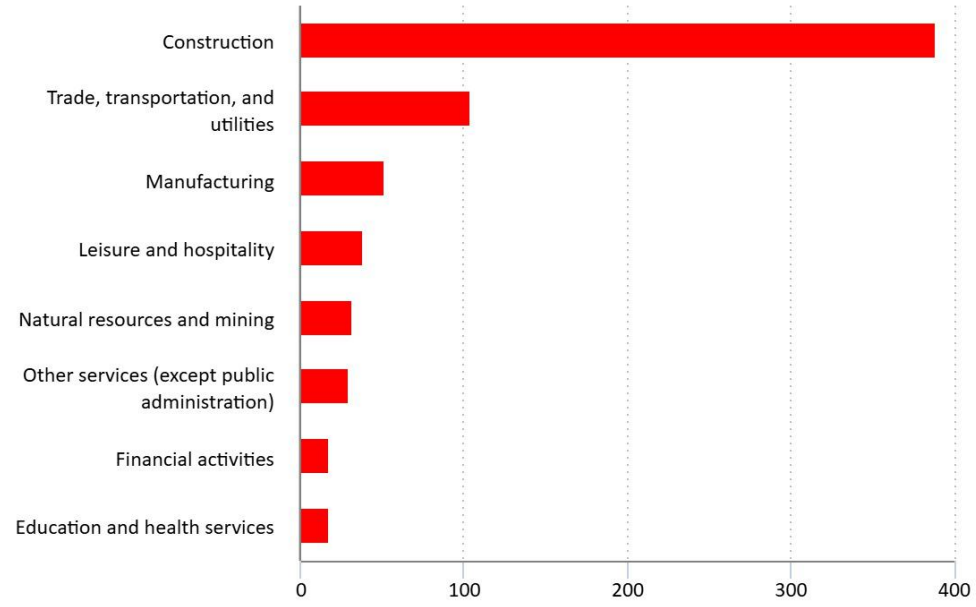
BACKGROUND

Falls remain to be a source of injuries and fatalities in the workplace. According to the US Bureau of Labor and Statistics[1], in 2024, there were 1,034 workplace deaths in the private-sector construction industry. Over one-third (389) of fatal injuries in construction were due to falls, slips, and trips, and 95.9 percent of these were falls to a lower level. Construction accounted for almost half (48.8 percent) of all fatal falls, slips, and trips in private industry in 2024.

These falls often result in head injury. Work-related traumatic brain injuries (WRTBIs) are estimated to represent 4–24% of all traumatic brain injuries reported each year[2]. According to the National Council of Compensation Insurance, brain and head in injuries, such as TBIs, account for a significant portion of mega claims—17% of mega claims between $3 million and $5 million, and 30% of mega claims in excess of $10 million. For active claims between 2013 and 2018, the average total incurred cost per TBI claim was more than double the average for all lost-time claims through a second report. As of 2018, lost-time TBI claims accounted for almost 5% of reported medical payments on all countrywide lost-time claims even though they represent only 2.5% of these claims.[3]

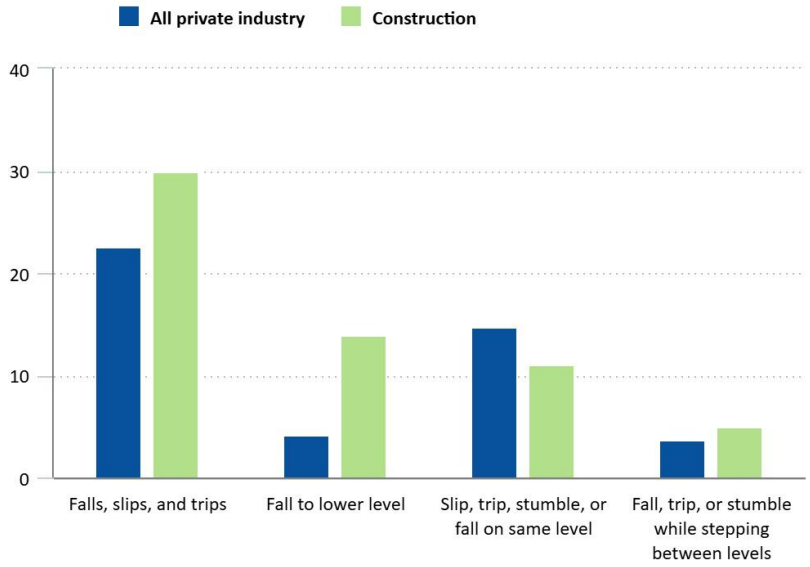
[1] "National Safety Stand-Down Highlights Fall Hazards in Construction : The Economics Daily : U.S. Bureau of Labor Statistics." 2024. Bureau of Labor Statistics. https://www.bls.gov/opub/ted/2026/national-safety-stand-down-highlights-fall-hazards-in-construction.htm.
[2] Colantonio, Angela, Sara Salehi, Vicki Kristman, J. David Cassidy, Angela Carter, Oshin Vartanian, Mark Bayley, et al. 2016. "Return to Work after Work-Related Traumatic Brain Injury." Edited by Juliet Haarbauer-Krupa. NeuroRehabilitation 39 (3): 389–99. https://doi.org/10.3233/nre-161370.
[3] "Traumatic Brain Injuries in Workers Compensation - Associated Medical Services and Costs." 2021. NCCI Holdings Inc. 2021. https://www.ncci.com/Articles/Pages/Insights-Traumatic-Brain-Injuries-WorkersComp.aspx.

Fatal falls, slips, and trips in selected private industries, 2024



Hover over chart to view data.
Source: U.S. Bureau of Labor Statistics.

Annualized rates of nonfatal falls, slips, and trips involving days away from work per 10,000 full-time private-industry workers, 2024



Click legend items to change data display. Hover over chart to view data.
Source: U.S. Bureau of Labor Statistics.

STAFF EVALUATION

Head Protection

American National Standard Institute (ANSI)

Head protection can reduce the severity of the injury and save lives by reducing the impact to the head caused by falling or being struck by moving objects or falling objects.

There are two types of approved impact helmets per American National Standards for Industrial Head Protection, ANSI Z89.1-2014. These are the Type I and Type II impact helmets with three different Classes. For example, one may purchase a Type II, Class E helmet.

- Type I helmets are designed to reduce the impact force from a blow to the top of the head.
- Type II helmets are designed to reduce impact force from a blow to the top or sides of the head.
- Class G (General) intended to reduce the danger of contact with low voltage conductors. Test samples shall be proof tested at 2200 volts (phase to ground)
- Class E (Electrical) Class E helmets are intended to reduce the danger of contact with higher voltage conductors. Test samples shall be proof tested at 20,000 volts (phase to ground).
- Class C (Conductive) are not intended to provide protection against contact with electrical hazard.

Additional Requirements for Type II helmets

Type II helmets are required to meet additional performance requirements by passing the ANSI prescribed test methods.

- Impact Energy Attenuation. Type II helmets include a liner (foam) that is intended to absorb impact force, therefore lessening the amount of impact energy received by the head. Impact Energy Attenuation test is in section 10.4 of the ANSI standard.
- Off-Center Penetration. The impact testing on the headform is performed in various positions to demonstrate protection against impact.: front, side, rear and anywhere on the shell above the Dynamic Test Line (DTL) - drawing in ANSI standard. Impact penetration test is in section 10.5 of the ANSI standard.
- Chin Strap is a required element and shall remain attached to the helmet when tested.

Virginia Tech University STAR system rating

Virginia Tech University developed a rating system called the Safety Technology and Research (STAR) system. They developed test methods beyond the minimum safety standards to quantitatively evaluate impact performance and rate helmets. Historically, their research was focused on head impacts and helmets in sports.

In 2025, the Construction STAR tests methods[4] were developed to quantitively compare safety helmets performance in the context of concussion and skull fracture risks. According to the study, the STAR scores show that Type II helmets reduce the concussion risk by 32.7% and skull fracture by 57.5% compared to the Type I helmets.[5] Virginia Tech Helmet Ratings recommend Type 2 helmets with a 4 and 5 star rating.

Cost

Board staff compared the cost of Type I and Type II helmets from various vendors and Type II helmets cost significantly more than Type I helmets.

Benefit

Type II helmets are designed to lessen the impact to the head, thereby decreasing the severity of the injury, which can potentially save lives and reduce costs caused by the injury.

Active vs Passive Fall Protection Systems

Active fall protection systems are systems that require active participation from the user to prevent fall or arrest falls. Examples of active fall protection systems are personal fall arrest and fall restraint or travel restraint systems. Components of personal fall protection system include: full-body harness, lanyards, self-retracting lifelines (SRL), anchorage points. Passive system does not require user interaction such as guardrails, barriers or nets.

RELEVANT STANDARDS

Federal Standards

There are no federal standards that specifically prescribe Type II helmets for employees who use active fall protection. However, there is a standard that requires employers to assess the risks prior to selecting personal fall protection. To serve as guidance for evaluating risk and selecting the appropriate head protection, OSHA released a safety bulletin SHIB 3-6-2024 Head Protection: Safety Helmets in the Workplace

29 CFR Subpart I – Personal Protective Equipment

CFR 1910.132. General Requirements

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[4] Susanna M. Gagliardi, Nicole E.-P Stark, Lee M. Edwards, Mark T. Begonia, and Steve Rowson. *STAR Protocol for Construction Helmets* (Blacksburg, VA; Virginia Tech Helmet Lab, Virginia Tech, 2025), https://vtechworks.lib.vt.edu/server/api/core/bitstreams/87102c67-180f-47e6-82c0-fbdd15c812d4/content

[5] Gagliardi, S.M., Stark, N.EP., Begonia, M.T. *et al.* Development of a Fall-Specific Impact Testing Method to Evaluate Safety Helmet Performance and Injury Risk. *Ann Biomed Eng* **54**, 777–795 (2026). https://doi.org/10.1007/s10439-025-03930-9

1910.132(d)

Hazard assessment and equipment selection.

1910.132(d)(1)

The employer shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE). If such hazards are present, or likely to be present, the employer shall:

1910.132(d)(1)(i)

Select, and have each affected employee use, the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment;

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29 CFR 1910.35 Head Protection

1910.135(a)

General requirements.

1910.135(a)(1)

The employer shall ensure that each affected employee wears a protective helmet when working in areas where there is a potential for injury to the head from falling objects.

1910.135(a)(2)

The employer shall ensure that a protective helmet designed to reduce electrical shock hazard is worn by each such affected employee when near exposed electrical conductors which could contact the head.

1910.135(b)

Criteria for head protection.

1910.135(b)(1)

Head protection must comply with any of the following consensus standards:

1910.135(b)(1)(i)

American National Standards Institute (ANSI) Z89.1-2009, “American National Standard for Industrial Head Protection,” incorporated by reference in § 1910.6

California Standards

California is more protective than the federal standard, because the employer under section 3381(c)(1) is required to select and require employees to use the appropriate impact helmet.

T8 CCR 3380. Personal Protective Devices

(f) Hazard assessment and equipment selection.

(1) The employer shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE). If such hazards are present, or likely to be present, the employer shall:

(A) Select, and have each affected employee use, the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment;

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T8 CCR 3381. Head Protection.

(a) Employees working in locations where there is a risk of receiving head injuries from flying or falling objects and/or electric shock and burns shall wear approved head protection in accordance with this section.

(b) When head protection is required, the employer shall provide each employee with head protection that meets the criteria in one of the following standards, which are hereby incorporated by reference:

(1) American National Standards Institute (ANSI)/International Safety Equipment Association (ISEA) Z89.1-2009, “American National Standard for Industrial Head Protection;”

(2) ANSI Z89.1-2003, “American National Standard for Industrial Head Protection;” or

(3) ANSI Z89.1-1997, “American National Standard for Industrial Head Protection.”

(c)(1) The employer shall ensure that the appropriate impact type helmet is selected and used.

Note: Protective helmets are described by impact type and electrical class. All protective helmets required by subsection (b) meet either Type I or Type II impact requirements. Type I helmets are intended to reduce the force of impact resulting from a blow only to the top of the head. Type II helmets are intended to reduce the force of impact resulting from a blow to the top or sides of the head.

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Consensus Standards

American National Standards for Industrial Head Protection, ANSI Z89.1-2014 (R-2019)

EN 397: 2025 Industrial Protective Helmets

EN 397: 2025 Technical Guidance

Other Standards, Guidelines, Codes

NIOSH Science Bulletin, November 10, 2022

Construction Helmets and Work-related Traumatic Brain Injury

STAFF ANALYSIS

Scope

The requested action will affect all industries that have employees who work at heights such as Construction, Agriculture, Manufacturing, Electrical, Petroleum, etc.

Evaluation of Risk

The requested action is intended to mitigate risks of a head injury to employees who work at heights and use personal fall protection. Working at height exposes the employee to fall and impact hazards.

As stated by the Petitioner, "the greatest risk of head injury when using a fall arrest system, is prior to full engagement of the fall arrest system. This occurs during and slightly beyond the Free Fall phase of the fall event. When a worker is tumbling, the head can easily strike objects even if the fall is arrested…"

Swing falls are dangerous. Swing falls occur when the personal fall arrest system is not anchored directly overhead. If a fall occurs, the employee will swing back and forth like a pendulum until the employee comes to a rest. While falling and swinging the employee may hit obstructions along the fall and swing path causing injuries to the worker, including the possibility of hitting their head. The jerking and swinging during a fall can cause the helmet to be dislodged from the head leaving the employee without head protection. Type II helmets are required to have a chin strap, thus helping secure the head protection.

Employees who wear active fall protection are exposed to the hazard of falling, falling objects, striking objects during the fall, thereby they are exposed to the risk of a head injury through impacts to the top, side and rear of the head.

STAFF RECOMMENDATION

Although section 3380(c)(1) requires the employer to ensure that the appropriate impact type helmet is selected and used, employers do not uniformly select Type II helmets as the type of head protection appropriate for employees who use active fall protection systems.

Therefore, Board staff recommend the Board to GRANT the petition to require ANSI approved Type II helmets for employees who are using an active fall protection system.