DEPARTMENT OF INDUSTRIAL RELATIONS
Occupational Safety and Health Standards
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TITLE 8. CALIFORNIA CODE OF REGULATIONS

Construction Safety Orders Section 1635
(Published on November 1, 2024)

Steel Framed Buildings – Fall Protection Around Floor Openings and Use of Cone and Bar Barricades (CBB)

NOTICE IS HEREBY GIVEN that the Occupational Safety and Health Standards Board (Board) proposes to adopt, amend or repeal the foregoing provisions of title 8 of the California Code of Regulations in the manner described in the Informative Digest, below.

PUBLIC HEARING

The Board will hold a public hearing starting at 10:00 a.m. on **December 19, 2024** in the **American River Room** of the **Rancho Cordova City Hall, 2729 Prospect Park Drive Rancho Cordova, CA 95670**, as well as via the following:

- Video-conference at www.webex.com (meeting ID 1469 63 6425)
- Teleconference at (844) 992-4726 (Access code 1469 63 6425)
- Live video stream and audio stream (English and Spanish) at
- https://videobookcase.com/california/oshsb/

At this public hearing, any person may present statements or arguments orally or in writing relevant to the proposed action described in the Informative Digest.

WRITTEN COMMENT PERIOD

In addition to written or oral comments submitted at the public hearing, written comments may also be submitted to the Board's office. The written comment period commences on **November 1, 2024,** and closes at 5:00 p.m. on **December 19, 2024**. Comments received after that deadline will not be considered by the Board unless the Board announces an extension of time in which to submit written comments. Written comments can be submitted as follows:

By mail to Attention: Cone and Bar Rulemaking, Occupational Safety and Health Standards Board, 2520 Venture Oaks Way, Suite 350, Sacramento, CA 95833; or By e-mail sent to oshsbrulemaking@dir.ca.gov.

AUTHORITY AND REFERENCE

Labor Code (LC) section 142.3 establishes the Board as the only agency in the State authorized to adopt occupational safety and health standards. In addition, LC section 142.3 requires the

adoption of occupational safety and health standards that are at least as effective as federal occupational safety and health standards. These proposed regulations will implement, interpret and make specific LC section 142.3.

INFORMATIVE DIGEST OF PROPOSED ACTION/ POLICY STATEMENT OVERVIEW

On January 17, 2019, the Board adopted a petition decision granting Petition 570 by Western Steel Council and District Council of Ironworkers (Petitioners). The decision directed Board staff to convene an advisory committee to consider the issues raised by the petition.

The Petitioners sought amendments in section 1710, Structural Steel Erection, relating to protections around floor openings and leading edges. The Petitioners proposed to add rules regarding the use of cones and bars as barricades for work involving openings, when work is considered as work in progress. This proposal is intended to address fall hazards due to openings in temporary floors, however, the rulemaking does not address one of the items in the petition, which is the timing of mid-rail installation in structural steel erection covered by title 8, section 1710.

The Board evaluated the proposed regulations pursuant to Government Code section 11346.5(a)(3)(D) and has determined that the regulations are not inconsistent or incompatible with existing state regulations. This proposal is part of a system of occupational safety and

health regulations. The consistency and compatibility of that system's component regulations is provided by such things as: (1) the requirement of the federal government and the Labor Code to the effect that the State regulations be at least as effective as their federal counterparts, and

(2) the requirement that all state occupational safety and health rulemaking be channeled through a single entity (the Standards Board).

The proposal differs from the federal standard because the proposal specifically addresses openings where work is in progress.

Anticipated Benefit

The Federal Occupational Safety and Health Administration (federal OSHA) has long focused on the "Constructions Fatal Four," which are the leading causes of death in the construction industry. Falls are the number one cause of construction related fatalities followed by struck by an object, electrocutions and caught-between.[1]

The proposal will help reduce falls through floor openings in unfinished floors while work is in progress by clarifying what is considered a barricade. According to stakeholders, industry has been using the CBB along with other materials (such as rope, caution tape, piled materials) for years. The proposal eliminates the use of rope, caution tape and piled materials as a barricade.

[1] EHS Daily Advisor. OSHA's "Fatal Four" – Leading Causes of Fatalities in the Workplace. Updated June 3, 2019. https://ehsdailyadvisor.blr.com/2019/05/oshas-fatal-four-leading-causes-of-fatalities-in-the-workplace/

The use of CBB as proposed is a safer option because of the rules that are being proposed regarding its use, such as standardizing its set-up, materials used and training. In addition, the cone and bar clearly communicates the presence of the opening and its use coupled with personal fall protection protects the worker inside the CBB.

The specific changes are as follows:

Section 1635

The Petitioners asked to include the use of cone and bar barricades (CBB) in title 8, section 1710. The CBB system includes multiple interconnected traffic cones and retractable lightweight plastic bars set up and maintained at least 6 feet and no more than 10 feet from a floor opening for the purpose of warning employees of the opening, limiting access to a nearby opening and demarcating areas where personal fall protection is required.
Although the Petitioners proposed amendments to section 1710 to address the hazards due to openings in temporary floors, section 1635 is the more appropriate section to amend. Section 1635 addresses hazards relating to temporary floors of buildings and hazards where construction is still in progress, which includes when the structure does not have a finished or permanent floor.

Subsection (c) applies to steel erection construction where work is in progress and requires floor openings to be uncovered. Currently, subsection (c)(2) permits the use of barricades to protect workers from a fall hazard created by floor openings. However, there are no specifications to describe an acceptable barricade.

The proposed amendments to section 1635 are as follows:

- Subsection (c) was amended to clarify that subsection (c) also applies to newly created floor openings and not just existing floor openings that were once covered. The effect of the proposed change will prevent a misinterpretation of the rules. On construction sites, there are existing deck openings and openings created due to a job change order, design change or to correct a mistake.

- Subsection (c)(2) was amended to delete “floor area adjacent to the” because this vague phrase has been replaced with more specific placement language via the proposed addition of the CBB system explained in subsection (c)(2)(B).

  Subsection (c)(2) was also amended to require that openings only be barricaded by guardrails or CBB systems by adding “by guardrails, the cone and bar barricade (CBB) system or” after the phrase “The floor opening shall be barricaded.” “Guardrails” was added as a type of permitted barricade for consistency with section 1632. Existing subsection (c)(2) requires floor openings be barricaded, but does not specify the type of materials that can be used to create a barricade. The effect of the proposal is to clarify that no other form or type of barricade is permitted other than guardrails and the CBB

system.

The phrase “the floor opening shall” was deleted as a grammatical correction. The effect of this modification is to better describe the need to barricade or cover floor openings to protect workers from fall hazards due to floor openings in structural steel framed building construction.

A Note was added to subsection (c)(2) to direct the reader to the Appendix to section 1635 to illustrate and inform the reader what the CBB system looks like.

- Proposed new subsection (c)(2)(A) adds specifications on the materials for the CBB system. The effect is to inform the reader of the required materials.

- Proposed subsection (c)(2)(A)1. contains the specifications of the cones; color, height, weight and labeling requirements. The effect is to inform the employer of the type of cones required and how the cones must be labeled. These specifications are intended to increase visibility, which makes the employees more aware of their surroundings.

- Proposed subsection (c)(2)(A)2. requires the bar, plastic pipe or rigid material be of high visibility color in solid or pattern so that it will be more noticeable to employees working in the area. This is necessary because increased visibility makes the employees more aware of their surroundings and this awareness helps workers identify floor openings and the risk of falls.

- Proposed new subsection (c)(2)(B) contains rules regarding the installation and use of the CBB system. These proposed amendments are necessary to organize the rules regarding use. The materials and the rules listed under subsection (c)(2)(B) are what makes the CBB system effective to help prevent falls.

- Proposed subsection (c)(2)(B)1. requires the cones be firmly connected to each other by bar, plastic pipe or a similar substantial rigid connecting medium to cordon off the area of the fall hazard. If a portion of the CBB system is not interconnected, the disconnected section could be mistaken as an entry point. The effect of the interconnecting cones and bars is to create a physical barricade that clearly demarcates the area of restricted access.

  The subsection also specifies the bar be placed 6 inches from the top of the cone, which determines the height of the bar from the floor. Floors in construction sites are uneven, making it necessary to measure from the top of the cone. The effect is to standardize the placement of the cones and height of bars to ensure that the CBB system will be used as intended.

- Proposed subsection (c)(2)(B)2. requires the cones and bars be set up prior to creating the opening and the CBB system to be maintained at least 6 feet from the opening until the task is completed or the opening is covered. The effect of setting up the CBB before

creating the opening communicates to the employees the impending presence of a fall hazard as the opening is being created. It also limits access to the area prior to creating a fall hazard.

- Proposed subsection (c)(2)(B)3. requires the CBB system remain in position and maintain its integrity to form a functioning barricade. If the barricade material breaks, loses its form or gets displaced, it is no longer an effective barricade. The effect of the requirement is to ensure a functioning barricade for the duration of its use.

- Proposed subsection (c)(2)(B)4. requires that employees setting up, walking inside or working inside the demarcated area use personal fall protection. The effect is to ensure the employees are protected from falls while creating the floor opening, removing the cover and lifting up or cutting the decking material. This requirement is consistent with section 1710(m)(2).

- Proposed subsection (c)(2)(B)5. requires that the barricade not be used for falling object protection and prohibits work directly below the floor opening barricaded by the CBB system. This requirement clarifies that the CBB system's purpose is not to prevent objects from falling into the opening and it would not be effective for falling object protection. The CBB system is used to barricade openings when work is in progress. Work near the floor opening has an inherent risk of items such as tools and building materials falling through the opening. Working below an opening where work is in progress presents a hazard to employees due to falling objects, debris and sparks from grinding or welding operations. The effect of the requirement is to prohibit work directly below an opening barricaded by a CBB system and prevent injuries due to falling objects.

- Proposed subsection (c)(2)(B)6. prohibits unauthorized employees from disturbing or entering the area demarcated by the CBB system. The success of the CBB system is dependent on employees respecting the barricade and the effect is to permit only workers who are authorized by the employer to enter the barricaded area.

- Proposed subsection (c)(2)(B)7 requires employers to train their employees on the proper set up and use of the CBB system. The effect is to ensure employees know what is required to keep themselves and their co-workers safe. This subsection also requires the employer to document the training consistent with existing requirements under sections 1509 and 3203(b). The effect is to enhance clarity and improve consistency with existing regulations.

- Subsection (c)(5) is amended to require the placement of the CBB system be verified by a qualified person prior to each shift and following strong wind conditions. The requirement provides the employer the opportunity to correct the placement of the barricade. The effect is to ensure the CBB system is properly set up and has not been displaced to protect workers from fall hazards.

Appendix to Section 1635

The proposal adds a non-mandatory appendix, consisting of: Figure 1635.1. Cone and Bar Barricade (CBB System); Figure 1635-2. CBB System In-Use; and Notes to provide information regarding its use. The effect is to show what a CBB system looks like.

DISCLOSURES REGARDING THE PROPOSED ACTION

Mandate on Local Agencies or School Districts: None.

Cost or Savings to State Agencies: None.

The proposal does not consider potential sales tax revenues. Cone and bar systems is being added as one of the ways to protect employees from falling through openings and leading edges; therefore, it would be speculative to consider potential sales tax revenues. Since an employer has the option to use plank and plywood or guardrails, there is no way to determine the number of instances where substitution will be made.

The proposal is not expected to increase the contracting cost for new construction or remodeling of existing buildings. According to stakeholders, industry has been using the CBB for years, so the cost for the CBB would have already been absorbed in prior contracts where CBB was used. So, there will likely be no incremental contracting cost due to purchasing of CBB materials.

According to stakeholders, industry has been using the CBB along with other materials (such as rope, caution tape, piled materials) as a barricade for about 10 years. Although the proposal eliminates the use of caution rope, caution tape, and piled material as barricade, the use of CBB as proposed is safer because of the rules that are being proposed regarding its use, such as standardizing its set-up, materials used and training. The cone and bar system clearly communicates the presence of the floor opening and its use coupled with personal fall protection protects the worker inside the CBB.

The use of CBB also decreases the use of plank and plywood. There is a potential for cost savings through the use of less plank and plywood. However, the exact amount of cost savings is uncertain as the use of CBB is an alternative to the use of plank and plywood for certain circumstances where work is still in progress. Additionally, it is not known how much less plank and plywood would be used if it was not used to cover an opening. The cost savings are dependent on how widespread CBB use becomes. The materials that make up a CBB system are more durable, lightweight and easier to install than plank and plywood, which would result in decreased cost in storage, transportation, labor and materials. Additionally, the amount of substitution is difficult to quantify as it varies per project and the use of plank and plywood would not be entirely eliminated by the proposal.

Therefore the use of CBB will not have an incremental cost on contracts or to the specialized contractors because industry has been using the CBB as a barricade for years and any potential

savings due to the decreased use of plank and plywood is unknown since the amount of substitution is difficult to quantify as it varies by project and it is not known how much less plank and plywood would be used if it was not used to cover an opening.

Cost to Any Local Government or School District Which Must be Reimbursed in Accordance with Government Code Sections 17500 through 17630: None.

Other Nondiscretionary Cost or Savings Imposed on Local Agencies: None.

Cost or Savings in Federal Funding to the State: None.

Cost Impact on a Representative Private Person or Business:

The Board is not aware of any cost impacts that a representative private person or business would necessarily incur in reasonable compliance with the proposed action.

Statewide Adverse Economic Impact Directly Affecting Businesses and Individuals: Including the Ability of California Businesses to Compete:

The Board has made an initial determination that this proposal will not result in a significant, statewide adverse economic impact directly affecting businesses/individuals, including the ability of California businesses to compete with businesses in other states.

The proposal would affect 1,513 structural steel contractors, costing these specialized contractors approximately $14.32 million in materials over the 10-year lifetime of the regulation. However, the exact amount of cost savings is uncertain as the use of CBB systems is one of the permissible means of protecting employees from falls through openings and it is not known how much less plank and plywood would be used if it was not used to cover an opening.

There is no additional cost for personal fall protection because iron workers are already equipped with full body harnesses and lanyards as required by section 1710. There is no additional cost for training because existing regulations like sections 1509, 1510 and 3203 require training and safety meetings. Furthermore, some employers already use CBB systems, but the rules regarding the use are not standardized.

General contractors of multi-story buildings with structural steel skeletons would be affected only to the extent that they need to be familiar with the proposed rules as the controlling employer of the jobsite who has the authority to stop unsafe work and require the structural steel contractor to correct the hazard. However, the proposal is not expected to increase the contracting cost for new construction or remodeling of existing buildings since, according to stakeholders, industry has been using the CBB for years.

The proposal will not create, eliminate or expand jobs or businesses in California.

Significant Effect on Housing Costs: None.

SMALL BUSINESS DETERMINATION

The proposal will affect small businesses. The percentage of businesses with less than 100 employees – which are considered small businesses – is approximately 93% of all structural steel contractors.[2]

RESULTS OF THE ECONOMIC IMPACT ASSESSMENT/ANALYSIS

The proposed regulation will not have any effect on (1) the creation or elimination of California jobs;(2) the creation of new businesses or the elimination of existing California businesses or (3) the expansion of existing California businesses.

Employers are already required to cover, barricade or provide fall protection to address fall hazards due to floor openings in temporary floors. The proposal prescribes what is considered a barricade and standardizes the use of CBB systems by providing specifications and rules for use.

According to an email communication received from Western Steel Council in 2019, the cost per employer for CBB systems was approximately $3,000, or equivalent to the purchase of 85 cones and 85 bars. Since then, the cost of cones and bars has increased, which amounts to $4,984.58 per employer, including sales tax.

According to the California Contractor's State Licensing Board data, there are approximately 1,513 structural steel contractors (C-51 license).[3] When taking the number of contractors (1,513) multiplied by the cost of CBB system materials shown below ($4,984.58) it equals approximately $7.54 million. In addition, the annual ongoing replacement cost is approximately $498.46 per business, representing 10% of the initial cost. Multiplied by 1,513 contractors, this yields $6.79 million over the 10-year regulation's lifetime. Including the initial cost of $7.54 million, the total statewide costs that businesses may occur to comply with the regulations over its lifetime are approximately $14.32 million.

Cost of Cones
Number = 85 28-inch cones (estimated as number of cones needed to cover roughly 2,000 square feet)
Cost per cone = $26.30[4]
Cost of 85 cones = $2,235.50
Total cost of cones with 10.75% tax rate = $2,475.82

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[2] United States Census Bureau. 2019 SUSB Annual Data Tables by Establishment Industry. U.S. & states, 6-digit NAICS. Released December 2023. https://www.census.gov/data/tables/2021/econ/susb/2021-susb-annual.html
[3] California Contractor's State License Board. Publica Data Portal, List of Contractors by Classification. Accessed March 15, 2024. https://www.cslb.ca.gov/onlineservices/dataportal/
[4] Traffic Safety Store. 28" Traffic Cones. Accessed March 15, 2024. https://www.trafficsafetystore.com/traffic-cones/orange-economy-28#C28HDS2X

Cost of Bars
Number = 85 (estimated as number of bars needed to cover roughly 2,000 square feet) Cost per bar = $26.65[5]
Cost of 85 bars = $2,265.25
Total cost of bars with 10.75% tax rate = $2,508.76

Initial Statewide Cost of CBB Systems
CBB system material cost with 10.75% tax rate = $4,984.58. Number of structural steel contractors in California = 1,513 Total initial statewide cost of CBB systems = $7,541,669.54

Ongoing Cost of CBB Systems
Annual ongoing replacement CBB system material cost (10%) = $498.46 Number of structural steel contractors in California = 1,513
Annual statewide ongoing cost = $754,169.98
Total ongoing cost over 10-year lifetime ($754,169.98 x 9 years) = $6,787,529.82

Total Cost of CBB Systems
Total initial statewide cost of CBB systems = $7,541,669.54 Total ongoing cost over 10-year lifetime = $6,787,529.82 **Grand total = $14,329,199.36**

There is no additional cost in personal fall protection because iron workers are already equipped with full body harnesses and lanyards as required by section 1710. There is no additional cost for training because sections 1509, 1510 and 3203 require training and safety meetings. Furthermore, some employers already use CBB systems, but the rules regarding their use are not standardized.

BENEFITS OF THE PROPOSED ACTION

The proposal will help prevent falls through floor openings in unfinished floors of buildings by clarifying what is considered a barricade. According to stakeholders, industry has been using the CBB along with other materials (such as rope, caution tape, piled materials) for years. The proposal eliminates the use of rope, caution tape and piled materials as a barricade. The use of CBB as proposed is a safer option because of the rules that are being proposed regarding its use, such as standardizing its set-up, materials used and training. In addition, the cone and bar clearly communicates the presence of the opening and its use coupled with personal fall protection protects the worker inside the CBB.

The use of the CBB with personal fall protection is an alternative to the use of plank and plywood for certain circumstances where work is still in progress. For example, work where a cover is used would require repeat opening and covering throughout the day.

There is a potential for cost savings by using less plank and plywood. However, the

[5] Traffic Safety Store. 6’ to 10’ Traffic Cone Bar by JBC Safety. Accessed March 15, 2024. https://www.trafficsafetystore.com/traffic-cones/cone-bars-6-10#CB10OW

exact amount of cost savings is uncertain, because the use of CBB is an alternative (not mandated) to plank and plywood in certain circumstances where work is still in progress. Additionally, it is not known how much the use of CBB will offset the amount of plank and plywood purchased. The cost savings are dependent on how widespread CBB use becomes. The materials that make up a CBB system are more durable, lightweight and easier to install than plank and plywood, which would result in decreased cost in storage, transportation, labor and materials. Additionally, the amount of substitution is difficult to quantify as it varies per project and the use of plank and plywood would not be entirely eliminated by the proposal.

The use of CBB will not have an incremental cost on contracts or to the specialized contractors because industry has been using the CBB as a barricade for years and any potential savings due to the decreased use of plank and plywood is unknown since the amount of substitution is difficult to quantify as it varies by project and it is not known how much less plank and plywood would be used if it was not used to cover an opening.

The proposed regulation ultimately protects the health and safety of California workers but does not offer a direct benefit to the state's environment.

CONSIDERATION OF ALTERNATIVES

In accordance with Government Code section 11346.5(a)(13), the Board must determine that no reasonable alternative it considered to the regulation or that has otherwise been identified and brought to its attention would either be more effective in carrying out the purpose for which the action is proposed or would be as effective and less burdensome to affected private persons than the proposed action or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provision of law than the proposal described in this Notice.

The Board invites interested persons to present statements or arguments with respect to alternatives to the proposed regulation at the scheduled public hearing or during the written comment period.

The advisory committee discussed the use of delineators (looper tubes) versus cones. During the advisory committee meetings, the advisory committee members stated that cones were more stable and heat resistant than delineators. The cost of a delineator with a 12-pound base is approximately $23.30.[6] This alternative was rejected because in a high heat environment the delineators melt and fall over, making it an ineffective barricade.

[6] Traffic Safety Store. 42" Looper Tube. Accessed March 15, 2024. https://www.trafficsafetystore.com/delineator-tubes/looper-tube-42#TL42-3

CONTACT PERSONS

Inquiries regarding this proposed regulatory action may be directed to Ruth Ibarra, Staff Services Manager I or the back-up contact person, Amalia Neidhardt, Principal Safety Engineer at the Occupational Safety and Health Standards Board, 2520 Venture Oaks Way, Suite 350, Sacramento, CA 95833; (916) 274-5721.

AVAILABILITY OF STATEMENT OF REASONS, TEXT OF THE PROPOSED REGULATIONS AND RULEMAKING FILE

The Board will have the entire rulemaking file available for inspection and copying throughout the rulemaking process BY APPOINTMENT Monday through Friday, from 8:00 a.m. to 4:30 p.m., at the Board's office at 2520 Venture Oaks Way, Suite 350, Sacramento, California 95833.

Appointments can be scheduled via email at oshsbrulemaking@dir.ca.gov or by calling (916) 274-5721.

As of the date this Notice of Proposed Action is published in the Notice Register, the rulemaking file consists of this Notice, the proposed text of the regulations, the Initial Statement of Reasons, supporting documents, or other information upon which the rulemaking is based.

Copies may be obtained by contacting Ruth Ibarra or Amalia Neidhardt at the address or telephone number listed above.

AVAILABILITY OF CHANGED OR MODIFIED TEXT

After holding the hearing and considering all timely and relevant comments received, the Board may adopt the proposed regulations substantially as described in this Notice. If the Board makes modifications which are sufficiently related to the originally proposed text, it will make the modified text (with the changes clearly indicated) available to the public at least 15 days before the Board adopts the regulations as revised. Please request copies of any modified regulations by contacting Ruth Ibarra or Amalia Neidhardt at the address or telephone number listed above. The Board will accept written comments on the modified regulations for at least 15 days after the date on which they are made available.

AVAILABILITY OF THE FINAL STATEMENT OF REASONS

Upon its completion, copies of the Final Statement of Reasons may be obtained by contacting Ruth Ibarra or Amalia Neidhardt at the address or telephone number listed above or via the internet.

AVAILABILITY OF DOCUMENTS ON THE INTERNET

The Board will have rulemaking documents available for inspection throughout the rulemaking process on its web site. Copies of the text of the regulations in an underline/strikeout format, the Notice of Proposed Action and the Initial Statement of Reasons can be accessed through the Board's website at http://www.dir.ca.gov/oshsb.