OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD
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INITIAL STATEMENT OF REASONS

CALIFORNIA CODE OF REGULATIONS
TITLE 8: Section 1635 of the Construction Safety Orders

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

SPECIFIC PURPOSE AND FACTUAL BASIS OF PROPOSED ACTION

On January 17, 2019, the Occupational Safety and Health Standards Board (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.

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

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. This is necessary to ensure that existing and newly created openings are protected. 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 or the cone and bar barricade (CBB)
- system," after the phrase "The floor opening shall be barricaded." This means no other form or type of barricade is permitted. "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 proposal to prescribe the type of barricade and rules regarding its use is necessary to ensure the effectiveness of the CBB system in preventing falls.
- In addition, in subsection (c)(2), the phrase "the floor opening shall" was deleted as a grammatical correction. The purpose and necessity for 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. This is necessary 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. This is necessary to inform the employer of the type of cones required and how the cones must be labeled.
- 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 create a barricade,

the cones and bars have to connect to demarcate the area that has restricted access. If a portion of the CBB system is not interconnected, the disconnected section could be mistaken as an entry point. This is necessary because barricades are a way of cordoning off the area of the fall hazard.

- 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. The measurement is taken from the top of the cone because the floor may be uneven. Stated measurements are necessary to standardize the placement of the cones and height of the bar 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 an 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. This is needed to warn employees of 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. This is necessary because if the barricade material breaks, loses its form, or gets displaced due to high heat or strong winds, the CBB system will no longer be an effective barricade.
- Proposed subsection (c)(2)(B)4. requires that employees setting up, walking inside or working inside the demarcated area use personal fall protection. This requirement is consistent with section 1710(m)(2). Personal fall protection is necessary to ensure the workers creating the floor opening by removing the cover and lifting the cover up or cutting the decking material are protected from falls.
- 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. The CBB system's purpose is not to prevent objects from falling into the opening and would not be effective for falling object protection.
- The CBB system is used to barricade openings when work is in progress because work near the 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 prohibition of working directly below an opening barricaded by a CBB system is necessary to 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. This is needed because 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 in the proper set up and use of the CBB system. Employee training is necessary to inform employees about what is required to keep themselves and their co-workers safe. This subsection also requires the employer to document training consistent with existing requirements under sections 1509 and 3203(b). This proposed amendment is necessary for consistency with existing regulations and to enhance clarity.
- Subsection (c)(5) is amended to clarify that along with the placement of covers, the CBB system must be verified by a qualified person prior to each shift and following strong wind conditions. This clarification is proposed for consistency with this proposal and existing regulations. This is necessary 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 illustrate what a CBB system looks like and provide information regarding its use.

REFERENCE TO COMPARABLE FEDERAL REGULATION

The comparable federal regulation is 29 Code of Federal Regulations (29 CFR) section 1926.760(a)(1), which requires a walking/working surface with unprotected sides or edges be protected from fall hazards by guardrail systems, safety net systems, personal fall arrest systems, positioning device systems or fall restraint systems. The federal standard does not specifically address openings when work is in progress. The proposal requires the area be barricaded to prevent other employees who are not directly working on the opening from being exposed to a fall hazard. Personal fall protection is required for employees who are setting up, walking inside or working inside the CBB system.

TECHNICAL, THEORETICAL AND/OR EMPIRICAL STUDIES, REPORTS OR DOCUMENTS RELIED ON BY THE BOARD

1. Occupational Safety and Health Standards Board Advisory Committee meeting roster, attendance sheets, invitation and minutes, October 10 and 11, 2019. https://www.dir.ca.gov/oshsb/documents/Use-of-Cone-Bar-Barricade-Petition-570-AC-roster.pdf
2. https://www.dir.ca.gov/oshsb/documents/Use-of-Cone-Bar-Barricade-Petition-570-AC-invite.pdf
3. https://www.dir.ca.gov/oshsb/documents/Use-of-Cone-Bar-Barricade-Petition-570-AC-minutes.pdf
4. Occupational Safety and Health Standards Board. Petition 570 submitted by the District

Council of Iron Workers and Wester Steel Council on August 7, 2018. https://www.dir.ca.gov/oshsb/documents/petition-570.pdf

5. Occupational Safety and Health Standards Board. Petition 570 Adopted Decision. January 17, 2019.
6. https://www.dir.ca.gov/oshsb/documents/petition-570-adopteddecision.pdf
7. Division of Occupational Safety and Health (Cal/OSHA). Evaluation of Petition 570. December 17, 2018.
8. https://www.dir.ca.gov/oshsb/documents/petition-570-dosheval.pdf
9. Occupational Safety and Health Standards Board. Evaluation of Petition 570. December 19, 2018.
10. https://www.dir.ca.gov/oshsb/documents/petition-570-staffeval.pdf
11. Email from Greg McClelland with the Western Steel Council to Maryrose Chan with the Occupational Safety and Health Standards Board, regarding Economic and Fiscal Cost of CBB, dated October 18, 2019.
12. Traffic Safety Store. 28" Traffic Cones. Accessed March 15, 2024. https://www.trafficsafetystore.com/traffic-cones/orange-economy-28#C28HDS2X
13. Traffic Safety Store. 6' to 10' Traffic Cone Bar by JBC Safety. March 15, 2024. https://www.trafficsafetystore.com/traffic-cones/cone-bars-6-10#CB10OW
14. Traffic Safety Store. 42" Looper Tube (Delineator). Accessed March 15, 2024. https://www.trafficsafetystore.com/delineator-tubes/looper-tube-42#TL42-S
15. 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/
16. United States Census Bureau. 2019 SUSB Annual Data Tables by Establishment Industry.
17. U.S. & states, 6-digit NAICS. 2021 SUSB Annual Data Tables by Establishment Industry.
18. U.S. & states, 6-digit NAICS. Released December 2023. https://www.census.gov/data/tables/2021/econ/susb/2021-susb-annual.html
19. 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/

These documents are available for review BY APPOINTMENT Monday through Friday from 8:00 a.m. to 4:30 p.m. at the Board office located at 2520 Venture Oaks Way, Suite 350, Sacramento, California. Appointments can be scheduled via email at oshsb@dir.ca.gov or by calling (916) 274-5721.

PETITION

Petitioner: District Council of Iron Workers and Western Steel Council; File No. 570.

The Board received a petition on August 8, 2018, to amend section 1710 of the Construction Safety Orders contained in title 8 of the California Code of Regulations to include new definitions, change decking installation requirements, change fall protection requirements and incorporate the use of a cone and bar barricade system around floor openings in addition to the use of temporary railings or coverings required by section 1632. On January 17, 2019, the Board granted the petition to the extent that the Petitioners' proposal be referred to a representative advisory committee for consideration.

A copy of the petition, Cal/OSHA's evaluation, Board staff evaluation and the Board's petition decision are included as Documents Relied Upon.

ADVISORY COMMITTEE

This proposal was developed with the assistance of an advisory committee. (The advisory committee roster, attendance sheets, invitation and minutes are included as Documents Relied Upon.)

FIRE PREVENTION STATEMENT

This proposal does not include fire prevention or protection standards. Therefore, approval of the State Fire Marshal pursuant to Government Code section 11359 or Health and Safety Code section 18930(a)(9) is not required.

SPECIFIC TECHNOLOGY OR EQUIPMENT

The proposal requires specific equipment to be used as a barricade. The materials proposed for the CBB system are heat resistant, lightweight and easy to transport.

According to the Petitioners, the proposed CBB system has demonstrated its effectiveness in over 10 million hours of use, and Petitioners note that industry has already been using the CBB system for years.

ECONOMIC IMPACT ANALYSIS/ASSESSMENT

The proposal will have no adverse economic impact on businesses. The estimated cost 10-year cost to the steel erection industry is approximately $14.3 M, which includes the first year cost of $7.5 M and $6.8 M over 9 years. The proposal would affect 1,513 structural steel contractors. 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.

This proposal will not (1) create or eliminate jobs within the State of California, (2) create new businesses or result in the elimination of existing businesses within the State of California or (3) expand businesses currently doing business within the State of California.

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 through the use of less plank and plywood. The materials that make up a CBB system are durable, lightweight and easier to install than plank and plywood, which would result in decreased cost in storage, transportation, labor and materials. However, the exact amount of cost savings is uncertain as the use of CBB system 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. 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.

EVIDENCE SUPPORTING FINDING OF NO SIGNIFICANT STATEWIDE ADVERSE ECONOMIC IMPACT DIRECTLY AFFECTING BUSINESSES

The Board 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.

Although the use of CBB systems incurs the cost of materials, its use also is likely to reduce to some extent the amount of plank and plywood used to cover openings where work is in progress. The decreased use of plank and plywood means less employee hours for installation and exposure to ergonomic hazards due to lifting. However, the decreased use of plank and plywood 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 was not included in the estimation of benefits.

REASONABLE ALTERNATIVES TO THE PROPOSAL AND THE BOARD'S REASONS FOR REJECTING THOSE ALTERNATIVES

The advisory committee discussed the use of delineators 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 (looper tube) with a 12-pound base is approximately $26.65.[1] [1]The estimated 10-year cost is $13.5 M, which includes first-year cost of $7.1 M and $6.4 M over 9 years.

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