OCCUPATIONAL SAFETY AND HEALTH
STANDARD BOARD

PETITION FILE NO. 578

BOARD STAFF EVALUATION

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INTRODUCTION

Petition File No. 578 (Petition) was submitted by Richard Manuel, Safety Director, Lancaster Burns Construction, Inc. (Petitioner) on August 5, 2019. The Petition seeks to amend Title 8, Construction Safety Orders, Section 1710(l), regarding temporary flooring in skeleton steel construction of multistory buildings.

REQUESTED ACTION

The Petitioner requests an amendment to Section 1710(l) "Temporary Flooring – Skeleton Steel Construction in Multistory Buildings" to add an exception providing temporary flooring will not be required under certain conditions where, he asserts, installing such flooring would create a greater hazard.

PETITIONERS ASSERTIONS

Petitioner asserts that:

- "Section 1710(l)(7) has a very significant gray area that undermines safety…"
- Amending the regulation "opens windows of opportunity to utilize new technology and equipment" to significantly reduce fall risks.
- Ambiguity in the regulation almost led to Lancaster Burns Construction, Inc. (LB Construction) being cited for violation of the regulation.
- There is confusion and disagreement on the requirements of the section within the Cal/OSHA program.
- The section has no relation to steel connecting in multistory buildings "where the building has been professionally engineered and does not rely on metal decking or planking for structural integrity during the erection process."
- The regulation as written "creates a more dangerous environment for structural steel connectors by forcing them to climb (shinning of columns) and walk on steel (coon or walk the bottom flange) in order to connect."
- "[The practice of using aerial lifts to perform skeleton steel construction connections] not only adheres [to] fall protection standards of Title 8 it also helps prevent hazards 3 and 4 of the focus four: 'Struck By' and 'Caught in Between'."

STAFF EVALUATION

On September 5, 2019, Board staff and three Division representatives visited a construction site in San Bruno, CA, to observe a skeleton steel erection project. The job was staffed by ironworkers who, when asked, stated they oppose the Petitioner's alternative process for steel erection using aerial lifts without the presence of temporary flooring within 30 feet of the level being erected.

Among the concerns discussed between the Division, workers onsite, and Board staff were the following:

Concern 1) Difficulties in performing steel connections from aerial lifts with limited ability to reach the upper levels of the structure,

Concern 2) Overhead hazards of falling tools and materials to employees working below the connecting work without temporary flooring,

Concern 3) Difficulties in rescuing a stranded worker without temporary flooring to serve as a base for the rescue effort, and

Concern 4) The lack of structural stability afforded the building by laterally bracing it with temporary flooring.

On October 8, 2019, staff spoke with the Petitioner to discuss the Petition and the above concerns. In regard to Concern 1, the Petitioner stated that his proposal is not intended to apply to all skeleton steel projects. For instance, he said that he only intends to use aerial lifts for building projects up to the first three stories (due to height limitations of the lifts), and those with favorable onsite conditions (e.g. solid, level surfaces without obstructions) that allow aerial lifts to operate safely. Also, jobsites with many other trades present, where a controlled access zone (CAZ) would be difficult to enforce, would not be good candidates for aerial lifts, he said. He stated that using boom and scissor lifts to connect the first few stories of a building provides a much safer working surface than the narrow I-beams currently used.

To control overhead hazards of falling objects and tools (Concern 2), he said that he uses warning tape and posted signs to demarcate the boundaries of the CAZ. Additionally, a foreman was stationed at the entrance of the CAZ to prevent entry to the area below the connecting work. He said that the foreman had a radio that could be used to signal the crane operator and others to stop work if someone was to enter the area. He also said that his workers are often the only trade present at this stage of construction, making the CAZ easier to regulate.

When staff asked the Petitioner about procedures to rescue a stranded employee from a man basket (Concern 3), the Petitioner explained that his process requires the use of multiple aerial lifts, which can be used for rescue if needed. In contrast, he explained that rescuing a fallen employee from a steel beam requires pulling the worker back up to the beam from which he/she fell, or climbing a ladder and attempting to bring the employee down. He said that working from the aerial lift would allow quicker and safer rescue of a distressed employee.

Finally, in response to Concern 4, he explained that due to the design of certain buildings, the temporary flooring is not required to provide lateral stability. He said that the lateral bracing for stability is built into the structure by the registered professional engineer that designed it.

In addition to the inherently secure working surface of an aerial lift, the Petitioner said that employees would have easier access to water while in the lift. He stated that steel surface temperatures can exceed 140°F in the summer. He also indicated that although employees are wearing personal protective equipment to prevent direct skin contact with the heated steel, they are still required to climb and straddle the steel at different stages of the erection process, exposing them to burns and an increased risk of heat illness.

Accident Review

Staff reviewed construction fatalities on the OSHA.gov website from 2009 to the present[1,2] using the search word "steel" as a filter to identify accidents that occurred during the connecting process of skeleton steel erection. Incidents prior to 2015 did not include OSHA inspection numbers and lacked sufficient detail to allow staff to determine confidently that the incident occurred during steel erection work.

In order to be included in Table 1, the fatality had to have an OSHA inspection number and include a detailed Accident Investigation Summary with enough information to determine that the employee was likely involved in skeletal steel erection activities when the incident occurred.

	Entry Date	Location	OSHA Accident Investigation Summary
1	2/26/2019	Prairieville, LA	At 8:45 a.m. on February 25, 2019, an employee was walking along a steel beam while moving decking material. During work, the employee fell and struck concrete. He suffered a head injury and was killed.
2	1/12/2019	Bakersfield, CA	At 2:32 p.m. on January 12, 2019, an employee had welded a steel post to the uppermost beam on a steel structure. The employee was wearing an Ultra-Safe brand safety retractable lanyard and harness. During the fall, the fall arrest system failed and the employee was killed. The employee fell 48 feet to the ground.
3	7/16/2018	Chalfont, PA	At 2:00 p.m. on July 13, 2018, an employee was working at a construction site, helping to erect multiple steel columns. During work, one of the steel columns being positioned fell forward, striking the employee's back head. The employee was killed.

[1] https://www.osha.gov/fatalities. Accessed multiple times prior to 10/10/19 for fatalities occurring in fiscal year 2017 or later.
[2] https://www.osha.gov/fatalities/reports/archive. Accessed multiple times prior to 10/10/19 for fatalities occurring prior to fiscal year 2017.

4	6/20/2018	Brigantine, NJ	At 11:30 a.m. on June 20, 2018, Employee #1 was observing the crane's movement and placement of a steel beam. The steel beam disengaged from the crane's haul line and fell, striking the employee on the head. Employee #1 sustained a fractured skull and was killed.
5	9/4/2015	Taunton, MA	At approximately 8:45 a.m. on September 4, 2015, an employee was on structural steel. He was waiting for a joist to be hoisted and placed so he could connect it. The crane operator was moving a bundle of decking. The bundle of decking was inside the building 'footprint'. The crane operator was going to move the decking bundle out of the way to facilitate installation of bridging by another connector in an aerial lift. The crane hit a truss to which the employee was tied off. The truss fell and caused the employee to fall. The employee struck the ground and may also have struck the girder that fell. The employee suffered from massive blunt trauma to the head and other body parts and was killed.
6	3/17/2015	Little Rock, AR	At 2:28 p.m. on March 17, 2015, an employee was walking on steel beam. The employee who was not anchored to structural component, lost his footing and fell from structural beam to concrete surface below. The employee was killed from a fracture to the head.
7	2/10/2015	Toccoa, GA	At 8:45 a.m. on February 10, 2015, an employee climbed a ladder to get up to a steel beam to secure it. The employee crawled onto the structural steel beam, which was being held in place by a "C" clamp, when the clamp came loose. The beam and the worker fell 14 feet. He hit his head on pieces of lumber and was killed.

Table 1: Summaries of fatality investigations since 2015 involving skeleton steel erection.

Each of the fatality incidents 1, 2, 5, 6, and 7 involve walking on steel with or without personal protection equipment. The Petitioner's proposed use of aerial lifts may have had some positive effect in averting these outcomes for falls from heights of three stories or less because the need for employees to walk on the steel beams is eliminated. The outcome of fatality incident 4 could have also been affected by the use of aerial lifts because, as stated in the petition, "after [the structural steel] connections are complete, workers operating the aerial lifts will move away until the next section of the sequence is [in position to be connected]."

Relevant Standards

Federal Standards

29 CFR 1926.754(b)(3) reads:

> *A fully planked or decked floor or nets shall be maintained within two stories or 30 feet (9.1 m), whichever is less, directly under any erection work being performed.*

While the federal language appears to be very clear in requiring "a fully planked or decked floor or nets" below erection work, federal OSHA has allowed the use of fall protection in the past to substitute for the required decking. Using the concept of a "de minimis" violation, or a technical violation of a standard without a direct or immediate relationship to employee safety or health, federal OSHA allows compliance officers leeway in citing violations to the standard.

However, after concerns from labor representatives and internal review, federal OSHA clarified its de minimis policy for the enforcement of 29 CFR 1926.754(b)(3). In a "Question and Answer" document[3] developed by federal OSHA to assist employers in complying with the paragraph, federal OSHA states the following:

> *Question 23: Section 1926.754 (b)(3) requires a "fully planked or decked floor or nets" in multi-story structures within two stories or 30 feet, whichever is less. Section 1926.760 requires workers above 15 feet to be protected from falls, with two exceptions: section 1926.760(b)(3) and (c) allows workers engaged in certain steel erection activities (initial connecting; decking in a Controlled Decking Zone) below 30 feet to work without using fall protection. Can an employer's requirement that all workers be protected by fall arrest systems, including those engaged in connecting and decking, take the place of compliance with the 1926.754(b)(3) floor/net requirement?* (Underlining added).

> *Answer: While OSHA encourages employers to exceed the fall protection requirements of the standard and have all workers use fall protection, section 1926.754(b)(3) provides additional safeguards. Therefore, such an employer would be required to comply with 1926.754(b)(3). However, compliance staff retain their normal discretion to determine, on a case by case basis, that violations are de minimis where there is no direct or immediate relationship to safety or health, and the employer's use of personal fall protection systems at all times may be a factor in such a determination. See OSHA's Field Operations Manual, CPL 02-00-148 (Nov. 9, 2009), section VIII.*

Labor Code 142.3 requires the Board to adopt regulations at least as effective as federal regulations addressing occupational safety and health issues. Federal interpretations and compliance directives, though potentially helpful in compliance with a regulation, do not remove the Board's requirement to be at least as effective as the federal language as written.

That said, California should not necessarily dismiss outright the potential benefits of the Petitioner's proposal. Although the Petitioner's suggested amendment could appear to

[3] https://www.osha.gov/enforcement/directives/cpl-02-01-048. Accessed 10/11/19.

contradict the federal language, the potential protections afforded by the Petitioner's suggestion may be superior to the safety afforded by the federal requirement in certain situations.

California Standards

California requirements differ slightly from the federal counterpart requirements by applying to the area below and directly under the tier of beams "on which any work is being performed" as stated below:

> *1710(l)(7) Where skeleton steel is being erected, a tightly planked and substantial floor shall be maintained within two stories or 30 feet, whichever is less, below and directly under that portion of each tier of beams on which any work is being performed.*

Article 4 "Structural Steel Framed Buildings" of the California Labor Code (LC) includes provisions for the erection of steel buildings more than two stories in height. The following sections are most relevant to the current petition:

LC Section 7250:

> *As used in this article "building" means any multifloor structural steel framed building more than two stories high in the course of construction.*

LC Section 7251:

> *As defined above, these provisions shall apply to buildings erected in tiers or stories and shall not apply to steel framed buildings having large open spans or areas such as, mill buildings, gymnasiums, auditoriums, hangars, arenas, or stadiums.*

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LC Section 7253:

> *There shall be a tight and substantial temporary floor within two floors below and directly under that portion of each tier of beams on which erection, riveting, bolting, welding or painting is being done. For operations of short duration of exposure to falling, safety belts shall be required as set forth in Section 7265.*

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LC Section 7266:

> *No person shall proceed with any work assigned to or undertaken by him, or require or permit any other person to proceed with work assigned to or undertaken by either, unless the planking or nets required by this article are in place. Violation of this section is a misdemeanor.*

Even if California were to contend that allowing steel erection work to be performed from aerial lifts is at least as safe as the federal regulations mentioned above, the Board would lack the authority to provide a regulatory exception to the above cited Labor Code requirements.

Position of Division

A Division report dated December 18, 2019 and signed by Eric Berg, Deputy Chief, recommends denial of the Petition. According to the Division, the Petitioner's proposal contradicts both the California Labor Code and federal OSHA regulations, and is unnecessarily duplicative of existing language.

Analysis

The Petitioner's request is two-fold: first, he wants clarification to the regulation as to when temporary flooring is required, and second, he is requesting an exception be added to the requirements for temporary flooring to allow employers to perform the work using aerial lifts. Although the first two floors can typically be erected before the requirement for temporary flooring applies, the exception is necessary because the temporary flooring obstructs the use of a scissor lift when connecting beyond the second floor.

The Petitioner's description of his experience with the Division in seeking approval to use aerial lifts in his steel erection process and the federal OSHA "Q&A" discussion (see Federal Standards above) may imply that at least some of the regulated public is unaware of the major reasons for providing temporary flooring within 30 feet or two stories below steel erection work. The major reasons for the flooring, as described in Concerns 2-4 above, as well as in the Division report, are not expressly stated in the state or federal requirements. An employer seeking a potentially safer way of performing a task (i.e. a reduction in employee exposure to falls from walking on steel) or a variance from existing requirements may run into conflict with the unstated reasons for the requirements of the temporary flooring.

Although the reasons for the temporary flooring are not explicitly stated in the regulation, the requirement for the temporary flooring is clearly stated. Therefore, amending the regulation to provide such information, though potentially helpful for compliance, is not necessary.

Walking on Steel

Although traditionally done for over a century, walking on steel at elevation is hazardous and factors into the high fatality rate of falls in the construction industry. Employees walking on the steel are also exposed to the hazards of being struck by or caught in between the steel as it is connected.

Current regulations allow steel erectors to perform certain tasks without fall protection. However, both the representatives at the San Bruno jobsite and the Petitioner state that they require "100% tie-off", or personal fall protection at all times, regardless of fall distance.

Significantly though, fatality incidents 2 and 5 described above occurred in spite of fall protection being used.

A basic means of controlling employee exposure to hazards is through the use of the hierarchy of controls. Removing a hazardous exposure from a work process is considered to be at the top of that hierarchy. Because the Petitioner's proposed alternative method for connecting steel using aerial lifts removes employees from exposure to the risks of walking on steel, it may warrant further study by safety professionals, even if done outside of the Board's processes.

Petitioner's Process

On October 15, 2019, staff observed a small steel erection jobsite where the Petitioner's employees were working. Although only a single level of steel was being erected (the remainder of the building would be made of wood), staff observed that the scissor lifts were clear of the beams as they were moved into place. Only after the beams were in position to be connected did the lifts move into the area. Furthermore, at no time were the scissor lifts underneath the hoisted load while the steel was being connected.

Existing regulations prohibit employees from working under the path of the suspended load as the steel is moved into position for erection. An exception is made for connectors making the initial steel connections (See Section 1710(d)(1)(A)). The Petitioner's proposal appears to eliminate the need for a suspended load to pass over employees.

Although there are several potential advantages to erecting structural steel using aerial lifts, the lifts can introduce numerous hazards into the process if used improperly. According to an OSHA fact sheet[4], aerial lifts require detailed training and can pose the following hazards:

- Fall from elevated level,
- Objects falling from lifts,
- Tip-overs,
- Ejections from the lift platform,
- Structural failures (collapses),
- Electric shock (electrocutions),
- Entanglement hazards,
- Contact with objects, and
- Contact with ceilings and other overhead objects.

Given the hazards described above, any revision to the existing Title 8 regulations to include an exception to Section 1710(l)(7) as proposed by the Petitioner would require considerate deliberation by an advisory committee. The Petitioner recognizes that the proposed exception is not appropriate for all structural steel work and recommends limiting it to three stories in height, in accordance with the maximum heights of the aerial lifts.

The Board encourages dialog discussing innovative technologies and practices when they can be demonstrated to improve the current level of safety provided by Title 8. However, in the case of Petition 578, the Board is limited by the provisions stated in Labor Code Sections 7253

[4] https://www.osha.gov/Publications/aerial-lifts-factsheet.html. Accessed 10/22/19.

and 142.3, requiring the Board to adopt regulations that are commensurate with comparable federal regulations, as stated previously. Therefore, it would appear the Board is precluded by statute from amending Title 8 Section 1710(l)(7) as requested by the Petitioner.

STAFF RECOMMENDATION

Given the preceding findings and discussion, Board staff recommends Petition File No. 578 be DENIED.