State of California
Department of Industrial Relations
Division of Occupational Safety and Health

Memorandum

Date: January 17, 2024

To: Autumn Gonzalez, Chief Counsel and Acting Executive Officer
Amalia Neidhardt, Principal Safety Engineer
Occupational Safety and Health Standards Board

From: Yancy Yap, Senior Safety Engineer
Jason Denning, Principal Safety Engineer
Eric Berg, Deputy Chief
Division of Occupational Safety and Health

Subject: Evaluation of Petition No. 599 to amend title 8 section 1604.21 regarding construction personnel hoist capacity and loading.

1.0 INTRODUCTION

On October 13, 2023, the Division of Occupational Safety and Health (Cal/OSHA) received a petition from Tanya Charlesworth, representing BrandSafway (Petitioner) proposing a change to title 8 section 1604.21. BrandSafway is a nationwide company, whose business, amongst other things, involves rental of construction personnel hoists (CPH) also known as construction personnel elevators (Figure 1).

The petitioner is requesting a change to title 8 subsection 1604.21(a) to adopt the requirements of *ANSI/ASSE A10.4-2016 Safety Requirements for Personnel Hoists and Employee Elevators on Construction and Demolition Sites* (ANSI 10.4). Specifically, the petitioner proposes an exception to the rated load of a CPH hoist car based on net platform area whenever the hoist is equipped with an overload sensor.

Labor Code Section 142.2 permits interested persons to propose new or revised standards concerning occupational safety and health and requires the Occupational Safety and Health Standards Board (Standards Board) to consider such proposals. California Labor Code section 147 requires the Standards Board to refer to Cal/OSHA for evaluation of any proposed occupational safety and health standard.

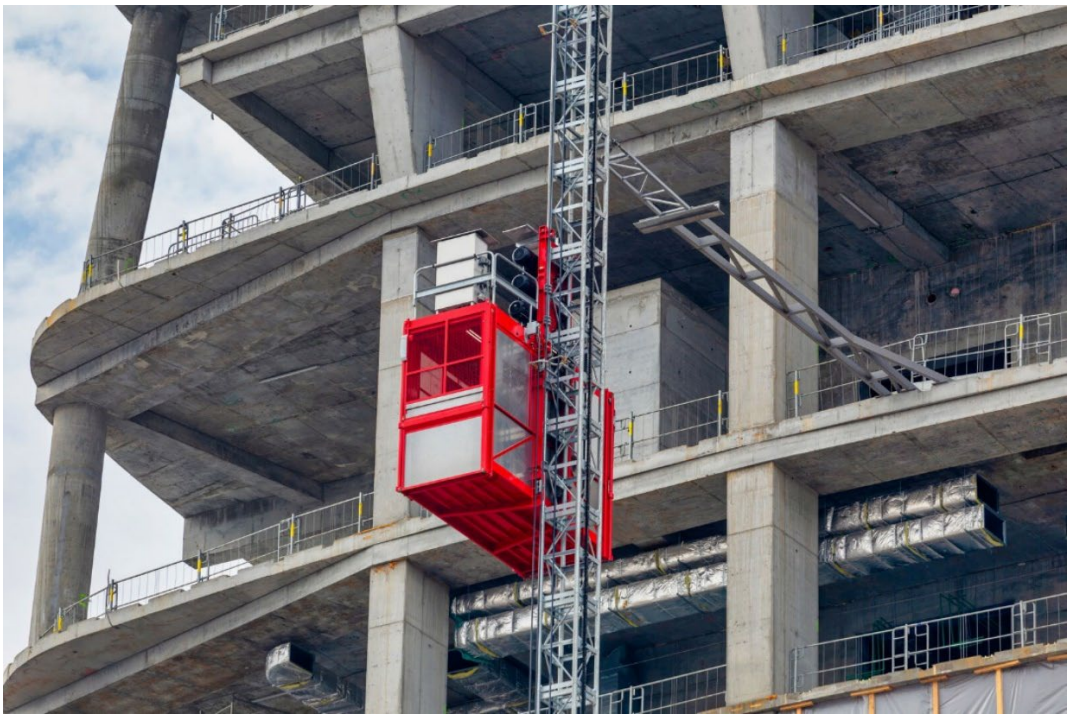

Figure 1. A Construction Personnel Hoist (CPH) is a temporary elevator used for carrying personnel and materials at construction sites. The hoist car in red coloring, consists of a "net platform area" which is the total floor space inside the hoist car. (Photo Credit: Technical Safety BC)

2.0 PETITIONER'S PROPOSAL AND BASIS FOR AMENDMENT OF TITLE 8 REGULATIONS

The petitioner requests to adopt part 21.1 of "ANSI A10.4-2016 – Safety Requirements For Personnel Hoists and Employee Elevators On Construction and Demolition Sites" which allows the hoist car floor area to be of any size provided the CPH is equipped with an overload sensor. An overload sensor is an electronic scale that determines the weight of materials and passengers in the hoist car and automatically disconnects power for the upward and downward movement of the hoist car when the load capacity of the CPH is exceeded. The petitioner did not offer any regulatory text for this proposed change.

The petitioner owns a large fleet of CPHs with extendable hoist cars whose length can vary from 10-feet up to 18-feet in length. According to the petitioner, the requirements of Table 4 in title 8 subsection 1604.21(a) limit the floor area of a CPH based on rated load, is unique to California, and prohibits the use of extendable hoist cars. The petitioner asserts that title 8 subsection 1604.21(a) is referencing an outdated 1973 version of ANSI A10.4 and, as a result, prohibits the petitioner's company from utilizing their large fleet of extendable hoist cars. As an example, the petitioner argues that 16-foot curtain walls for building façades, though long, are relatively light (Figure. 2). To transport long curtain walls, building contractors in California must rent CPHs with greater load capacities to attain floor areas large enough to accommodate such building components. As the rental price of CPHs varies directly with load capacity of the equipment, the need to obtain larger floor areas based on load capacity results in higher rental costs.

The petitioner asserts that having an overload detection device increases safety by preventing

movement of the hoist car whenever it is overloaded. The petitioner argues that there is no existing California regulation that prevents overloading of hoist cars and thus incorporation of an overload detection device provides a higher level of safety.

Figure 2. Installation of exterior building façade curtain wall. Curtain walls are non-structural building exterior coverings made from lightweight materials such as glass or aluminum. (Photo Credit: mornglass.com)

3.0 APPLICABLE TITLE 8 REGULATIONS

Title 8 section 1604.21 of the Construction Safety Orders includes requirements for rated capacity and related data plates for construction passenger hoists. Table 4 of subsection 1604.21(a) limits the inside net area of CPHs based on rated capacity. Subsection 1604.21(e) prohibits the use of overload devices.

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Construction Safety Orders
Article 14. Construction Hoists
§1604.21. Capacity and Loading.

(a) Inside Net Platform Area.
The inside net platform area (See Figure 4) of the hoist car is determined
by the rated capacity of the hoist and shall be no greater than that given
in Table 4.

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Table 4. Relationship of Hoist Rated Capacity to Inside Net Platform Area

Rated Load (pounds)	Inside Net Platform Area (square feet)
2,000	24.2
2,500	29.1
3,000	33.7
3,500	38.0
4,000	42.2
4,500	46.2
5,000	50.0
10,000	88.0

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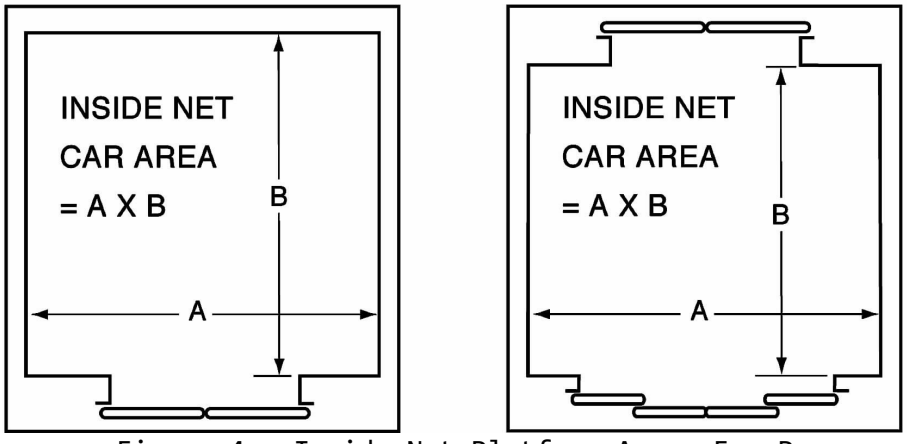

Figure 4 - Inside Net Platform Areas For Personnel-Hoist Cars

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(e) Overload Devices.

Overload devices shall not be permitted.

4.0 APPLICABLE FEDERAL OSHA REGULATIONS

Federal OSHA regulations related to construction personnel hoists are included in 29 CFR section 1926.552. Federal OSHA does not have regulations equivalent to 1604.21(a) limiting a hoist car's net platform area based on the hoist's rated capacity. Additionally, there are no Federal OSHA regulations on the use or the prohibition of overload devices for CPHs.

5.0 APPLICABLE CONSENSUS STANDARDS

The 2016 edition of ANSI A10.4 Safety Requirements for Personnel Hoists and Employee Elevators on Construction and Demolition Sites contains requirements for the design, inspection, maintenance, and use of personnel hoists in construction and demolition operations. Part 21.1 of ANSI 10.4 includes maximum net platform areas for CPH hoist cars based on the rated capacity of the equipment.

> ANSI/ASSE A10.4-2016 Safety Requirements for Personnel Hoists and Employee Elevators on Construction and Demolition Sites.
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> *****
>
> 21 Capacity and Loading.
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> *****
>
> 21.1 Inside Net Platform Area.
> The inside net platform area (see Figure 21.1)) of the hoist car shall be determined by the rated capacity of the hoist and shall be no greater than that given in Table 6 unless an overload detection device as described in Section 21.5 is provided. With the use of an overload detection device, the rated load ratio to inside net platform area shall not be less than 82psf (400 kg/m^2). The rated capacity shall not be increased without written approval of the manufacturer or a registered professional engineer, if the manufacturer is no longer in business. The authorized person assigned to the hoist is responsible for ensuring that the material carried in the hoist is appropriately secured to prevent it from shifting and the maximum load rating is not exceeded when transporting material or personnel.

Table 6
Relationship of Hoist Rated Capacity to Inside net Platform Area

Rated Load (pounds)	*Inside Net Platform Area (square feet)*
2,000	*24.2*
2,500	*29.1*
3,000	*33.7*
3,500	*38.0*
4,000	*42.2*
4,500	*46.2*
5,000	*50.0*
6,000	*57.7*
7,000	*65.3*
8,000	*72.9*
9,000	*80.5*
10,000	*88.0*

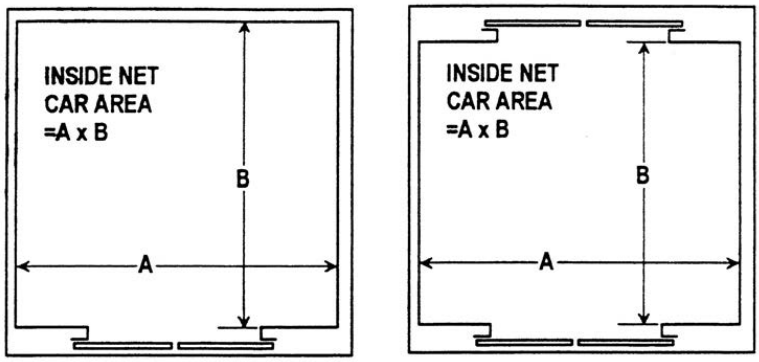

Figure 21.1 - Inside Net Platform Areas for Personnel Hoist Cars

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ANSI A10.4 – 1963, 1973, 1981, 1990, and 2007 were also reviewed by Cal/OSHA staff. The exception to the requirements of limited floor space on a CPH hoist cars when a CPH is equipped with an overload detection device was not included until the 2016 edition of ANSI A10.4.

6.0 Cal/OSHA Enforcement History and Data

Cal/OSHA Research and Standards Safety Unit staff conducted research for incidents investigated by the Cal/OSHA Enforcement Unit involving the overloading of or use of overload devices on CPHs. No citations, accidents, or injuries related to overloading of CPHs or the use of overload devices were identified as result of this research.

7.0 Cal/OSHA ANALYSIS

7.1 Information from the Cal/OSHA Elevator Unit

Cal-OSHA Research and Standards Safety Unit staff consulted with subject matter experts from the Cal/OSHA Elevator Unit to gain a better understanding of the origination and intent of the requirements in Table 4 of subsection 1604.21(a) to limit CPH floor area based on rated capacity. During these discussions, Cal/OSHA Elevator Unit safety engineers conveyed the following information.

The purpose of limiting the CPHs platform dimension in relation to its rated capacity is to prevent overloading the platform. The limited platform area reduces the likelihood of overloading the CPH, but it does not guarantee overloading, depending on the density of material.

The use of a device to detect an overload condition prevents the CPH from running after it has been overloaded. While the platform is stopped, brakes hold the platform at the floor level. Since the hoist brakes can only hold a certain amount of weight, it would not be difficult to quickly overload a platform and overcome the brakes causing the hoist car to fall. Therefore, an overload device as the only method to prevent overloading does not provide the same level of safety as limiting the ability to overload the hoist platform by its area.

In the Elevator Unit's experience, load weighing devices are often out of calibration or non-functional. Additionally, Elevator Unit staff pointed out that ANSI A10.4-2016 does not include a requirement to perform periodic or acceptance testing of overload detection devices unlike mechanical components such as ropes, bearings, gears, car safety, and governor parts which have specific directives for inspection of wear and for testing to ensure the parts have not worn to unsafe levels. There are also no inspection and testing or maintenance protocols for overload detection devices within the ANSI A10.4-2016 standard.

ANSI A10.4 section 21.5 allows the use of an overload device in lieu of Table 6 if the ratio of the rated capacity to the net platform area does not exceed 82 pounds per square foot at any hoist capacity rating. As illustrated by Table A below, the 82 pounds per square foot limitation results in a platform area that is larger than those in Table 4 of subsection 1604.21(a). Section 1604.21 is more protective than ANSI A10.4 because the smaller platform area limits the likelihood of overloading a CPH thereby providing a higher degree of safety.

Table A. Comparison of Title 8 Section 1604.21 and ANSI A10.4 Section 21.1. - The table shows using a constant 82 pounds per ft^2 results in a larger platform size at higher CPH capacities.

Hoist Rated Load-Capacity (pounds)	Ratio of Rated Load to Inside Net Platform Area (Pounds per ft^2)		Inside Net Platform Area (ft^2)	
	Title 8 Section 1604.21(a)	ANSI A10.4-2016	Title 8 Section 1604.21(a)	ANSI A10.4-2016
2,000	82.6	82.0	24.2	24.4
2,500	85.9	82.0	29.1	30.5
3,000	89.0	82.0	33.7	36.6
3,500	92.1	82.0	38.0	42.7
4,000	94.8	82.0	42.2	48.8
4,500	97.4	82.0	46.2	54.9
5,000	100.0	82.0	50.0	60.9
10,000	113.6	82.0	88.0	121.9

7.2 Proposals of Petitions 589 and 599 are Different.

The Occupational Safety and Health Standards Board granted Petition file No. 589 on October 21,

2021. Petition 589 proposed to update Article 14 Construction Hoists of the title 8 Construction Industry Safety Orders by incorporating nineteen items from the ANSI A10.4-2016 standard. One of the proposals in Petition 589 was to allow the use of overload devices currently prohibited under section 1604.21(e).

Cal/OSHA supported the use of overload devices in Petition 589 as no change was proposed to the allowable net platform area requirements in title 8 subsection 1604.21(a). Therefore, the protection provided by maximum allowable CPH platform areas would be augmented by and not replaced by overload devices.

However, Petition 599 is different in that the proposal would allow for the use of overload devices in lieu of compliance with the net platform areas permitted by section 1604.21(a), thereby, permitting CPHs equipped with overload devices to have platforms of unlimited size. The hazards associated with overloading and the potential resultant failure of CPH components can lead to serious and fatal injuries to workers. The proposed use of overload devices in lieu of net platform limitations required by section 1604.21 would increase the risk of CPH failure and reduce worker safety.

7.3 A Risk Assessment was not Performed by the Petitioner

Cal-OSHA inquired if the petitioner had performed a risk assessment for using overload devices as a means of preventing overloading large platform areas. Risk assessment is an exhaustive method of determining various failure modes and their effects. The petitioner informed Cal/OSHA staff that they had not performed a risk assessment for the use of overload devices.

7.4 Alternative Options for the Petitioner.

As an alternative to the petition process, the petitioner may apply for a permanent variance from the Occupational Safety and Health Standards Board to make use of its large fleet of extendable hoist cars for carrying long curtain walls for building façades. If granted, a permanent variance could allow deviation from section 1604.21(a) specifically for the use of extendable hoist cars for carrying long curtain walls for building facades.

Another option for the petitioner is to use standard capacity hoist cars that are manufactured with long and narrow floor dimensions that can transport personnel and also accommodate 16-foot curtain walls. Long and narrow hoist cars can be manufactured within the platform limits of section 1604.21(a).

8.0 CONCLUSION

Cal/OSHA recommends that Petition file No. 599 be DENIED.

cc: Jeff Killip, Cal/OSHA Chief