OCCUPATIONAL SAFETY AND HEALTH
STANDARD BOARD

PETITION FILE NO. 574

BOARD STAFF EVALUATION

Submitted by: Michael J. Nelmida, Senior Safety Engineer

April 10, 2019

OSHSB Petition File No. 574
Board Staff Evaluation,
April 10, 2019

INTRODUCTION

Petition 574 (Petition) was submitted by Mr. Michael J. Vlaming (Petitioner), Executive Director of Construction Elevator Contractors Association (CECA) on December 26, 2018. The Petition seeks to amend California Code of Regulation, Title 8, Section 1604.5(d)(2) to repeal the 30-foot vertical tie-in interval and require construction passenger hoists (CPH) to be anchored to the building or structure in conformance with the manufacturer's specification or equivalent.

Figure 1. Construction Elevator (from Alimack Hek website)

REQUESTED ACTION

- Repeal the Section 1604.5(d)(2) provision requiring CPHs to be anchored at vertical intervals of 30 feet or less.
- Amend Section 1604.5(d)(2) to require that CPHs be anchored to buildings or structures "in conformance with, or be equal to, manufacturer's specifications."

Specifically, the Petitioner requests the following change:

(2) Each hoist structure shall be anchored to the building or other structure ~~at vertical intervals not exceeding 30 feet~~ in conformance with, or be equal to, manufacturer's specifications...

BACKGROUND/HISTORY

A February 1986 rulemaking effort (among other proposed changes) attempted to align the T8CCR Section 1604.5(d)(2) with the federal 29 CFR 1926.552 was terminated. Section 1604.5(d)(2) remained at 30-foot vertical intervals instead of the federally required 25-foot vertical interval.

PETITIONER'S ASSERTIONS

The Petitioner asserted that "*CECA members have experienced inconsistent… enforcement… regarding the erection of [construction] personnel hoists*." The Petitioner postulated that "*the current regulation was based on a published consensus industry standard*" that has been recently modified. The Petitioner argued that inconsistent application and recent change to the consensus standard justify the requested change.

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH (DIVISION) REPORT

The Division's evaluation has not been received from by the Board.

STAFF EVALUATION

Board staff examined the relevant federal, state, and national consensus standards. Moreover, Board staff reviewed the Board's original rulemaking records related to the proposal of T8CCR Section 1604.5(d)(2) from November 1974. Section 1604.5(d)(2) was later adopted and the standard has remained unchanged since. Further, Board staff reviewed the February 1986 rulemaking effort regarding construction passenger hoists, which was ultimately disapproved by the Office of Administrative Law. The Board did not pursue further action of the 1986 disapproval.

In addition, Board staff has sought and considered the opinions of the Petitioner, AFL-CIO, Operating Engineers, International Union of Elevator Constructors, and the Construction Employers Association.

Relevant Standards

Federal Standards

29 CFR 1926.552(c)
Personnel hoists.

*****

29 CFR 1926.552(c)(3)

Towers shall be anchored to the structure at intervals not exceeding 25 feet…

California Standards

T8, CCR Section 1604.5*(d) Hoist Structure.*

(2) Each hoist structure shall be anchored to the building or other structure at vertical intervals not exceeding 30 feet. Where the building or other structure is of such character that tie-ins cannot be made, the hoist structure shall be guyed by means of a suitable number of guys. Such guys shall be fastened to adequate anchorages to ensure hoist structure stability. When wire rope is used for guys, the rope shall be at least 1/2-inch in diameter.

Consensus Standards

The current consensus code is ANSI/ASSE A10.4-2016 which states:

5.4.2 Each hoist structure shall be anchored to the building or other structure at vertical intervals in accordance with manufacturers design specifications. Where the building or other structure is of such construction that tie-ins cannot be made, other means of securing the mast to the structure shall be designed by the manufacturer or by a registered professional engineer.

Staff Analysis

Construction passenger hoists (CPH) are required *for hoisting workers… on or in any building, or structure, 60 feet or more in height above or 48 feet in depth below ground level {T8 CCR 1630}* and *on demolition projects on multi-story buildings seven or more floors or seventy-two feet or more in height {T8 CCR 1735(r)(1)}*. CPHs are installed temporarily and normally dismantled upon completion of erection or demolition of the building or structure. CPHs may persist on a construction site for periods of more than one year and in rare cases, when granted a permanent variance by the Board, remain installed permanently.

Figure 2 Mast Ties (from Alimack Hek website)

Title 8 Section 1604.5(d)(2) requires the *hoist structure* (ideally, the mast) to be *anchored to the building or other structure at vertical intervals not exceeding 30 feet*. The regulation implies that tie-ins serve as the primary means by which the hoist structure is "anchored." Where tie-ins cannot be made, the regulation requires that *guys shall be fastened to adequate anchorages to ensure hoist structure stability*. Tie-ins are the preferred anchor contemplated under Section 1604.5(d)(2). Tie-ins are rigid structural braces (Figures 2 & 3) that resist overturning moments and prevent buckling of the mast/tower structure resulting

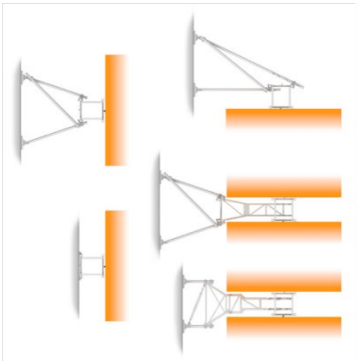


Figure 3.Mast Ties (from Alimack Hek website)

from the climbing or descending of the eccentrically located car with passengers along the mast. The tie-ins also align to the mast/tower structure to ensure a consistent clearance distance between the elevator car and each landing to the building. The stable and consistent clearances help ensure that the employees can embark and disembark from the elevator car at each landing safely. The tie-ins also assist in anchoring the conveyance when the CPH is subject to winds and possible seismic events.

Title 8, Section 1604.5(d)(2) is based on the ANSI A10.4-1973 requirement {T8CCR 1604}. Required tie-ins are installed at 30-foot intervals according to Section 1604.5(d)(2) rather than the 25-foot interval stated in the originating consensus standard.

ANSI A10.4-1973 Section 5.4.2 states*:*

Each hoist structure shall be anchored to the building or other structure at vertical intervals not exceeding 25 feet…

It is unclear, based on the Board's rulemaking files, why the regulation departed from the specified 25-foot interval of the ANSI A10.4-1973. However, the shorter interval prescribed under the federal requirements under 29 CFR 1926.552(c)(3), does not enhance safety where complying with the California regulation results an equal number of anchorages. Where the number of anchorages required under the California regulation equal the number of anchorages required for Federal compliance, the protection afforded to employees is commensurate.

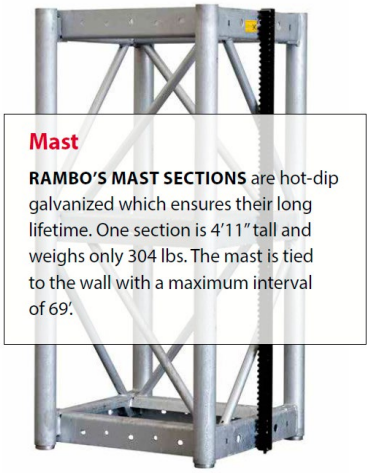


Figure 4. Scanclimber Rambo H65H mast details from Scanclimber website.

Title 8, Section 1604.5(d)(2) differs slightly from 29 CFR 1926.552(c)(3). Both standards in predictable and determinable fashion, specify along the vertical axis, the maximum tie-in intervals by which CPHs should be secured to the building or structure.

Interpretations of the manufacturer's specifications, varying in scope and clarity, do not provide the essential certainty of the existing standard. Figures 4 (above) and 5 (see next page) illustrate available descriptions and technical data regarding mast tie-ins for one of the manufacturers of personnel hoists.

Under the proposed change, the anchorage intervals must conform to the manufacturer's specification. The manufacturer (whose recommendations, upon which, the petition means to supplant the current standard) is not typically involved in the design of the structure/building upon which the CPH is secured. The Petitioner envisions that the responsibility to interpret the manufacturer's design specifications would fall upon Engineer of Record. The Engineer of Record would be responsible for ensuring that the "tie-in" configuration would meet the manufacturer's specification. An example of such manufacturer's specification is shown in Figure 5 and Attachment 1.

Technical Data

	SC2032-65H	SC2037-65H	SC2532-65H	SC2537-65H	SC3232-65H	SC3237-65H
Payload	4410 lbs or 24 persons	4410 lbs or 25 persons	5510 lbs or 24 persons	5510 lbs or 27 persons	7055 lbs or 24 persons	7055 lbs or 27 persons
Car internal length	10'6"	12'2"	10'6"	12'2"	10'6"	12'2"
Car internal width x height	4'11"x 6'9"	4'11"x 6'9"	4'11"x 6'9"	4'11"x 6'9"	4'11"x 6'9"	4'11"x 6'9"
Speed options: 118 or 177 or 295 ft/min	YES	YES	YES	YES	YES	YES
Single or twin car version	YES	YES	YES	YES	YES	YES
Power supply voltage	480V/60Hz	480V/60Hz	480V/60Hz	480V/60Hz	480V/60Hz	480V/60Hz
Top drive lifting unit	YES					
Overspeed safety device	YES					
Max. lifting height, with tied mast	985' (higher mast by request)					
Max. tieing distance	69' *)					
Max. lifting height, free-standing	40' *)					
Max. free mast after topmost tie	43' *)					
Mast section: height weight, single / twin	4'11" 304 lbs / 340 lbs					
Operation temperature	-13...+104° F					
Noise level	< 85 dBA					

*) depending on ground enclosure type, car amount (single or twin), car length and lifting capacity

Figure 5. Technical Data for Scanclimber H65H hoists from the Scanclimber website.

The Petitioner raised in follow-up discussions that increasing the distance between anchorages reduces loads upon the tie-ins where fixed to the building or structure the CPH services. In contrast the Petitioner argued that shorter anchorage intervals result in higher stress imposed upon the building or structure which anchors the mast. The Petitioner equates higher stresses to a reduction in safety. Higher stresses only result in a reduction in safety when not included in the design and selection of ties and anchorages. It is only the most recent edition of the ASSE code (2016) that replaces vertical intervals *"not exceeding 30 feet*" with "*in accordance with manufacturers design specifications.*" Vertical intervals of 30 feet have been routine for California employers since 1974.

The Petition, if granted, may decrease protections afforded to employees under to the current standard. The increase in the maximum vertical anchorage interval results in the leeway to install fewer anchorages. A structure 60 feet in height (the minimum building height requiring installation a CPH) would be required to employ two tie-ins to the building under 1604.5(d)(2). Under the proposed change, some CPH configurations, such as the ones highlighted under Figure 5, may only be required to install one tie-in.

The Petitioner points to the ASSE A10.4-2016 consensus code as the basis for the proposal, but departs materially from the referenced consensus standard by rephrasing the code requirement of "*at vertical intervals in accordance with manufacturers design specifications"* to "*in conformance with, or be equal to, manufacturer's specifications.*" The petition does not include an explanation for these differences. Also not discussed is why the phrase "vertical intervals" should be removed or what factors are to be considered to substantiate how a measure is "equal to" the "manufacturer's specification."

The Petitioner reasoned that the "*intent of the proposed change is to use the current consensus standard.*" The language of the petition was selected to further reflect the language used in Construction Safety Orders-Article 14. Construction Hoists Section 1604.5(d)(3), which states:

(3) Tie-ins shall conform to, or be equal to, the manufacturer's specifications and shall remain in place until the tower or mast is dismantled.

It is important to note that Title 8, Section 1604.5(d)(3) and ASSE A10.4 (2016) Section 5.4.3 are identical. The Petitioner's proposed change to Section 1604.5(d)(2) is not necessary to align the ASSE A10.4 Section 5.4.3 provision to the Title 8 requirements.

Manufacturers design and build CPHs and CPH components to conform to the latest ASSE code enacted at the time. However, there is no requirement for already existing CPHs to conform to later editions of the ASSE A10.4. Each successive edition of the code does not necessarily provide greater protections than the superseded code.

The Petitioner's proposed change would eliminate requirements for all CPHs to be anchored at no greater than 30 foot vertical intervals. In some cases, the manufacturer of CPHs may no longer be in operation to provide such specifications. The Petitioner's proposal would reduce the safety of the regulation and would reduce its clarity and specificity. Board staff therefore recommends against the proposed amendments to 1604.5(d)(2).

STAFF RECOMMENDATION

Board staff recommends Petition File No. 574 be DENIED.

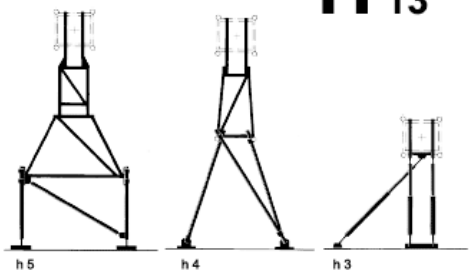
Attachment 1

H 13

Allowed freestanding mast height and min. – max. tie distances at actual mast height and overhang

For mast tie type I, II and III and for mast sections of Ø 76 x 4.2 mm tube dimensions – "new type".

Tables according to CEN and BS 4465, Zone 1.



Tube dimension		SCANDO FC 10/30 TD SCANDO 12/30 SCANDO 12/30 TD	SCANDO 20/30 SCANDO 17/30 TD SCANDO 20/30 TD SCANDO FC 20/30 TD	SCANDO 20/30 C	SCANDO 10/32 SCANDO 10/32 TD SCANDO 10/37 TD	SCANDO 20/32 TD SCANDO 17/37 TD SCANDO 20/37 TD	SCANDO 22/32 C	SCANDO 25/32 C	SCANDO 28/32 C SC. SUPER FC 28/32 C	SCANDO 28/37 C SC. SUPER FC 28/37 C
		Maximum allowed freestanding mast, in meter								
		15	15	13.5	15	13.5	15	15	15	15
4.2		Max. allowed freestanding mast/overhang with reduced max. load to allowed erection load, in meter Max. allowed wind speed 15 m/sec.								
		19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5
Mast height	Overhang	Tie distance in meter, min. – max.								
Single cage hoists SCANDO I										
0 – 100	16.5	9 – 24	9 – 24	–	9 – 24	9 – 24	–	–	–	–
meter	15	6 – 24	6 – 24	9 – 24	6 – 24	6 – 24	9 – 24	10.5 – 24	–	–
	13.5	4.5 – 24	4.5 – 24	6 – 24	4.5 – 24	4.5 – 24	6 – 24	7.5 – 24	7.5 – 21	7.5 – 21
	12	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 24	6 – 24	6 – 21	6 – 21
	10.5	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 21	4.5 – 21
	9	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 21	4.5 – 21
	7.5	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 21	4.5 – 21
	6	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 24	4.5 – 21	4.5 – 21
100 – 150	16.5	–	–	–	–	–	–	–	–	–
meter	15	9 – 21	9 – 21	–	9 – 21	9 – 21	–	–	–	–
	13.5	6 – 22.5	6 – 22.5	10.5 – 21	6 – 22.5	6 – 22.5	10.5 – 21	12 – 16.5	–	–
	12	4.5 – 22.5	4.5 – 22.5	6 – 22.5	4.5 – 22.5	4.5 – 22.5	6 – 22.5	7.5 – 21	9 – 21	9 – 21
	10.5	4.5 – 22.5	4.5 – 22.5	4.5 – 22.5	4.5 – 22.5	4.5 – 22.5	4.5 – 22.5	4.5 – 21	6 – 21	6 – 21
	9	4.5 – 22.5	4.5 – 22.5	4.5 – 22.5	4.5 – 22.5	4.5 – 22.5	4.5 – 22.5	4.5 – 21	4.5 – 21	4.5 – 21
	7.5	4.5 – 22.5	4.5 – 22.5	4.5 – 22.2	4.5 – 22.5	4.5 – 22.5	4.5 – 22.5	4.5 – 21	4.5 – 21	4.5 – 21
	6	4.5 – 22.5	4.5 – 22.5	4.5 – 22.5	4.5 – 22.5	4.5 – 22.5	4.5 – 22.5	4.5 – 21	4.5 – 21	4.5 – 21