

STATE OF CALIFORNIA  
DEPARTMENT OF INDUSTRIAL RELATIONS  
OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD  
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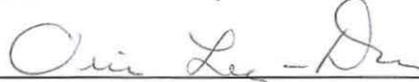
In the Matter of a Petition by: )  
) PETITION FILE NO. 561 DECISION  
Michael Gunland, CHST )  
Health/Safety Director )  
KROEKER, INC. )  
4627 S. Chestnut Ave. )  
Fresno, CA 93725 )  
)  
)  
Applicant. )

The Occupational Safety and Health Standards Board hereby adopts the attached  
PROPOSED DECISION.

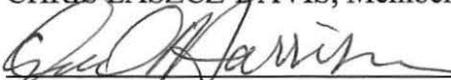
OCCUPATIONAL SAFETY AND HEALTH  
STANDARDS BOARD



DAVID THOMAS, Chairman

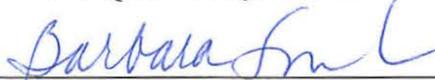


CHRIS LASZCZ-DAVIS, Member



DAVE HARRISON, Member

PATTY QUINLAN, Member



BARBARA SMISKO, Member



LAURA STOCK, Member

By: Marley Hart  
Marley Hart, Executive Officer

DATE: June 15, 2017  
Attachments

**OCCUPATIONAL SAFETY  
AND HEALTH STANDARDS BOARD**

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**PROPOSED DECISION OF THE  
OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD  
REGARDING PETITION FILE NO. 561**

INTRODUCTION

On January 26, 2017, the Occupational Safety and Health Standards Board (Board) received a submission, with subsequent amendment on March 13, 2017, on behalf of the National Demolition Association (NDA), by Michael Gunlund (Petitioner), identified as Safety Director of Kroeker, Inc., and NDA Safety Chairperson. The submission was received by the Board pursuant to Labor Code Section 142.2, and designated Petition 561 (Petition).

Labor Code Section 142.2 permits interested persons to propose new or revised regulations concerning occupational safety and health and requires the Board to consider such proposals and to render its decision no later than six months following their receipt.

SUMMARY

The Petitioner requested that the Board amend Title 8, California Code of Regulations, Section 1735(v), which requires the use of curbs or stop-logs around floor openings to prevent mechanical equipment from falling into floor openings during demolition operations. The requested change to Subsection (v) would allow use of a dual wire rope protective system, as an alternative to curbs or stop-logs. More specifically, the Petitioner proposes the following struck-out deletions, and underlined additions to Section 1735(v):

*Subchapter 4. Construction Safety Orders  
Article 31. Demolition  
§1735. Demolishing Buildings.*

\* \* \* \* \*

*(v) Where mechanical equipment is used for demolition work, floor openings shall ~~have~~ meet one of the following requirements:*

*(1) Curbs, or stop-logs shall be installed to prevent mechanical equipment from running over the edge, or*

*(2) A cable system consisting of two wire ropes shall be designed by a registered professional engineer, and of such construction to prevent the equipment from falling into the opening.*

(A) Calculations for a cable system must include:

1. The specific location in a structure, and for a specified equipment traveling at a certain speed.

2. The size of the wire ropes for each specific location in a structure to satisfy the requirement that the equipment is prevented from falling over.

\* \* \* \* \*

DIVISION EVALUATION

By means of an advisory memorandum, dated April 25, 2017, the Division of Occupational Safety and Health (Division) has recommended to the Board that the Petition be denied. In doing so, the Division does not doubt, given enough expert professional, site specific, engineering, and oversight, that a protective cable system, of the type proposed by the Petitioner, might be able to serve the safety function of the presently required curbs or stop-logs. Nonetheless, significant engineering challenges and uncertainties identified by the Division, inform its opinion that the Petitioner's proposal would undermine the safety provided by existing Title 8 requirements.

One among the significant safety concerns identified by the Division, is rather gravely raised within the Petition attached engineering consultants' analysis itself:

*"THE CONTRACTOR WILL BE RESPONSIBLE TO MAKE SURE THAT THE END COLUMNS OR END WALLS WHERE WIRE ROPE ARE TO BE ATTACHED ARE [ABLE] TO RESIST THE FORCES DEVELOPED BY THE...RESULTING TENSION FROM THE WIRE ROPE AND TO VERIFY THE OVERALL STRUCTURAL INTEGRITY OF THE EXISTING STRUCTURE."*

Just how perilous a responsibility the Petitioner's engineering consultant foresees being taken on by the demolition contractor, is further explained within the Division's advisory memorandum as follows:

*"The proposed system relies on the attachment of the cables to structural members of a building or structure that is being demolished. The structural members may be damaged or partially removed during dismantling operations which would likely result in their inability to sustain the required forces in excess of 32,000 pounds."*

The Division was no more favorably persuaded by the Petitioner having included as an attachment, a March 2, 2016, dated letter from the Federal OSHA, Directorate of Construction, reaching the following conclusions similar to those of the Division:

Wire rope barriers could potentially prevent demolition equipment from running off the edge of a floor openings, if;

- barrier engineering analysis were not only specific to the structure, but specific to each particular part of the structure where it would be installed;

- equipment speeds were kept below barrier design limitations;
- the “fairly involved” analysis of each structure specific barrier design was overseen by a structural engineer; and
- any such design documents bear the seal and signature of the equipment design, and installation overseeing, registered engineer.

The advisory memorandum of the Division does acknowledge the validity of concerns raised by the Petitioner about difficulties poised in designing curbs or stop-log systems of adequate size and strength to stop increasingly large loader equipment being used in the demolition industry. However, the Division goes on to point out that in addition to the comparatively straight forward design principles of curbs and stop-logs being both apparent and time tested, the Petitioner has not identified any reason to conclude that size and strength of curbs and stop-log could not be scaled up to perform as adequately in stopping larger equipment as they have long performed in containing smaller loaders.

The above outlined concerns of the Division, informing its recommendation of the Petition denial, highlight only some of the more elemental problems with the Petition proposal. Numerous other serious and well-reasoned concerns are raised within the Division’s advisory memorandum, which support a conclusion that the Petition proposal would undermine the workplace safety provided by existing Section 1735(v) requirements. For example, an elemental characteristic of cable barriers, namely deflection under load, is identified as posing significant, as yet unresolved, engineering challenges.

The Division also found worthy of note, the Petition having stated that the submitted wire rope barrier design had not yet been employed on a demolition project, in any jurisdiction.

#### BOARD STAFF EVALUATION

Board staff concurs with the Division in recommendation that the Petition be denied.

In addition to many of the same concerns raised in the advisory memorandum of the Division, the June 6, 2017, dated written evaluation of Board staff, identifies numerous additional bases for concern about the detriment to workplace safety potentially caused by the Petition proposal.

With respect to the Petition attached prototypical wire rope barrier design, Board staff points out numerous unresolved engineering issues. Among the most concerning of these, is that the tons of force an imperiled loader would exert against the proposed barrier, could not be presumed to be only horizontally outward, and at the mid-point of the barrier cable span. Instead, those forces could be both outward, and downward at an off-center point of the barrier cable spans, and by extension pulling unequally outward and downward against the columns to which the cables are attached. This not only further complicates barrier engineering, but also raise concerns about proposed reliance upon I-beam attachment clamps intended for other purposes.

As for the Petition claimed superiority of the proposed wire rope barrier, over curbs or stop-logs, in serving dual duty as both equipment barrier and personnel guardrail, Board staff points out that the Petitioner’s prototypical design has the lowest barrier cable placed 48 inches above the floor, as

compared to Title 8, Section 1620(a) required guardrails having both a top-rail no higher than 45 inches, along with a mid-rail below it.

### DISCUSSION

The prototype wire rope barrier design provided by the Petition proposes use of clamps intended for overhead hoisting as a means of attachment to vertical I-beam support columns. It also proposes attachment to reinforced concrete support columns by means of bisecting holes through which cables would be treaded, to then be pre-tensioned with tons of force to one side. The engineering analysis accompanying this conceptual design is quite clear that it remains to be established, on not only a structure by structure, but column by column basis, whether the structural columns to be relied upon, will perform safely for this purpose.

Complicating the required onsite engineering analysis of each structural column to which protective cable would be attached, is that the lateral forces to be borne by a pair of columns in arresting the errant travel of an imperiled 5 ton loader, are not those for which the column would have been originally designed, namely support of the building.

The forces a particular demolition loader may exert against a curb or stop-log system at any given angle and speed presumably could be tested, absent a floor opening, with limited or no damage to the equipment. By comparison, the complex compounding forces a loader may exert against a wire rope barrier and its mounting structure, as well as those that barrier would exert against the upper structure of the loader, eye-level to the operator, might be a much more infeasible and costly testing process.

As for the Petitioner argued safety benefit to be derived from keeping the bucket of the loader against the floor, pushing debris into the floor opening, as opposed to the lifting of a debris laden loader bucket over a curb or stop-log—the Board is not persuaded. Not only would any such shift occur on the side of the curb *away from* the floor opening, but an adequately trained and competent loader operator could be expected to both avoid, and promptly counteract, any destabilizing forward shift in loader center of gravity, *before* the loader bucket was over the opening. Compare that to the Petition proposed scenario of an operator pushing a loader bucket full of debris across the floor under a wire rope barrier, only to first sense the center of gravity shifting effect of the debris load as the bucket hangs out above the floor opening. Whether in actual practice such a hazard would arise, is not a certainty, it is but another among the many unresolved safety concerns associated with the Petitioner's proposal.

### DECISION AND ORDER

Having carefully read and considered Petition 561, as amended, as well as the above cited Petition evaluations of the Division and Board staff, Petition 561 is hereby Denied.