STATE OF CALIFORNIA EDMUND G. BROWN JR., *Governor*

DEPARTMENT OF INDUSTRIAL RELATIONS
DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
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Juliann Sum, Chief

February 17, 2015

Christopher Lee
[redacted]

Re: Title 8 Section 1712 Reinforcing Steel and Other Similar Projections.

Dear Mr. Lee;

Thank you for your letter of February 12, 2015 to the California Division of Occupational Safety and Health (Cal/OSHA) regarding protecting employees against impalement hazards during construction work. In your inquiry you asked the following:

QUESTION 1.

A member of United Contractors asked a question emanating out of the Modesto DO. He said he was informed by a compliance officer that bent rebar would no longer be accepted as a means of preventing impalement injuries.

RESPONSE TO QUESTION 1.

Title 8 section1712 requires employers to protect employees against impalement hazards. The regulation is not limited to rebar, but also requires protection against similar projections. 1712 states in part:

(c)(1) Employees working at grade or at the same surface as exposed protruding reinforcing steel or other similar projections, shall be protected against the hazard of impalement by guarding all exposed ends that extend up to 6 feet above grade or other work surface, with protective covers, or troughs.

(2) Employees working above grade or any surface and exposed to protruding reinforcing steel or other similar projections shall

> be protected against the hazard of impalement. Protection shall be provided by:
>
> (A) The use of guardrails, or
>
> (B) Approved fall protection systems meeting the design requirements of Article 24, or
>
> (C) Protective covers as specified in subsection (d).
>
> (3) Protective covers shall not be used to protect against impalement where the maximum height of fall exposure, to the top of the protective cover, exceeds 7 1/2 feet, unless the protective covers meet the requirement of subsection (d)(4)(D).

Title 8 section 1712 rulemaking conducted by the Occupational Safety and Health Standards Board (Standards Board) in 2003 initially allowed 'hooking'[1] of rebar as an acceptable form of impalement protection for employees working at grade. 'Hooking' was never considered as impalement protection for employees working above grade. The Standards Board removed provisions from the regulation to allow 'hooking' based on testing that demonstrated 'hooking' did not provide impalement protection. Documentation of the rulemaking proceedings is at http://www.dir.ca.gov/oshsb/rebarhazzards0.html. The Standards Board stated in the Final Statement of Reason:

> Further modifications are proposed to delete the proposed definition and practice of "hooking" in subsections (b) and (c), respectively, as a viable means of eliminating impalement hazards for employees working at grade. These modifications are the result of comments received during the first 15-Day Notice of Proposed Modifications as well as a video supplied by a commenter in which hooked rebar repeatedly failed as a means of impalement protection using drop tests…

Question 1 implies that Cal/OSHA at one time accepted bent or 'hooked' rebar as impalement protection after the 2003 rulemaking. This implication is incorrect. The Standards Board explicitly stated that '*hooking*' was not impalement protection at grade prior to the regulation becoming final. As a result, Cal/OSHA has not and has never considered bending rebar as impalement protection at grade after the 2003 rulemaking.

This does not mean that bent rebar always represents an impalement hazard to employees. For example, if bent rebar is tightly spaced and presents a large horizontal surface area for a person to fall onto, it may not represent an impalement hazard. Cal/OSHA cannot provide exact specifications where bent rebar represents an impalement hazard. However, the Standards Board determined in its rulemaking that a surface area of 16 square inches per rebar provides impalement protection.

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[1] "Hooked Rebar" is vertical reinforcing steel bent over to an angle of 90 degrees or more.

If tightly spaced 'hooked' rebar presents a horizontal surface area of 16 square inches or greater, the likelihood of impalement should be minimal, but each situation will be different. Pursuant to Title 8 section 1509, the employer must evaluate hazards at the worksite. This would include determining if 'hooked' rebar at the worksite represents an impalement hazard. If the employer determines that 'hooked' rebar does not represent an impalement hazard, for whatever reason, the employer should document the rationale behind the determination to provide to Cal/OSHA if necessary.

QUESTION 2.

Are caps [*sic*] the only acceptable means of preventing such injuries?

RESPONSE TO QUESTION 2:

It is assumed that you are referring to protective covers as defined in Title 8 section 1712 when referring to caps. Protective covers on 'hooked' rebar, in most cases, would not provide impalement protection. The covers are not designed nor intended to provide impalement protection when stricken from the side. If someone were to fall on a 'hooked rebar', the protective cover would likely be knocked off the rebar.

Wood or metal protective troughs built in accordance with Plate C-25 of the Construction Safety Orders should be used to cover 'hooked' rebar. The employer may also use job-built protective covers as specified by an engineer registered in California which are designed to cover the full horizontal length of 'hooked' rebar.

We hope this provides you with information you need. If you have any further questions regarding this or related safety concerns, please contact me at 510-286-7010.

Sincerely,

E Berg

Eric Berg

Acting Principal Safety Engineer