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16. Abstract (Limit: 200 words) This testimony discussed specific issues raised by OSHA in its proposed rule on concrete and masonry construction. OSHA discussed in that rule the design of handles on concrete buggies, maintaining that if the handles do not extend beyond the wheels of the buggy, then there is no need for knuckle guards. NIOSH believes such a design will help reduce the number of knuckle injuries if concrete buggies are pushed only in a straight line. NIOSH recommends that OSHA consider both the modification described in the proposed rule and the addition of knuckle guards. NIOSH also voices recommendations concerning the explanation for the design of concrete buckets, the use of tags in conjunction with lockout procedures, the requirement that workers not be located under precast concrete members that are being lifted or tilted into place, and several other points which OSHA discussed in relation to the proposed rule.

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NIOSH Comments to DOL

COMMENTS BY NIOSH ON OSHA PROPOSED RULE ON
CONCRETE AND MASONRY CONSTRUCTION

50 FR 37543
Docket No. S-301A

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Comments by NIOSH on OSHA Proposed Rule on Concrete and Masonry Construction

Docket No. S-301A

These comments address specific issues raised by OSHA in its proposed rule, concrete and masonry construction [29 CFR 1926] published September 16, 1985 in the Federal Register [50 FR 37543].

In Section III, Summary and Explanation of Proposal, OSHA discusses the design of handles on concrete buggies. OSHA maintains that if the handles do not extend beyond the wheels of the buggy, then there is no need for knuckle guards. NIOSH believes that such a design will help reduce the number of knuckle injuries if concrete buggies are pushed only in a straight line; however, we are concerned that this design will not be effective if a turn is required. Thus, NIOSH recommends that OSHA consider both the modification described in the proposed rule and the addition of knuckle guards.

OSHA's explanation for the design of concrete buckets explained in 1926.704(i) implies that the design being required is to prevent concrete from "hanging-up" on the outside edge of the bucket, thus, eliminating the potential for concrete to fall on workers who may be underneath the bucket. NIOSH believes this requirement was intended to ensure that the bucket can be completely emptied of concrete when the bucket gates are opened thereby eliminating the need for a

worker to climb into the bucket to use a vibrating tool or to strike the bucket from the outside to ensure complete emptying. NIOSH recommends that OSHA clarify this point.

Section 1926.704(k) requires tags to be used in conjunction with lockout procedures; paragraph (b) of 1926.704 only requires lockout. NIOSH recommends that OSHA require the use of tags for any operation that requires lockout procedures. NIOSH suggests that OSHA determine whether or not a worker who enters a mixer to chip out dried concrete is performing a "repair." If not, NIOSH recommends that lockout/tagout requirements be extended to cover this activity.

In 1926.706(a)(3), Precast Concrete, OSHA requires that workers not be located under precast concrete members that are being lifted or tilted into place. NIOSH fully supports this requirement. Several other situations come to mind that may present a potential hazard. For instance, should workers be prohibited from performing interior work on one level while precast members are being positioned on the level above them? In order to align a precast concrete slab with the steel connector inserts of an interior corner while the slab is suspended by the crane, a worker must either be on top of the slab or underneath it; does this requirement apply to such a worker?

In Section IV, OSHA raises a number of specific issues concerning this proposed rule. The first two relate to testing methods that can be

used to ensure that the concrete has been properly cured. NIOSH addressed this issue in comments submitted on April 19, 1982 in response to the Advance Notice of Proposed Rulemaking on this topic; at that time NIOSH stated:

> "Cast-in-place concrete which provides for structural integrity should be scrutinized through a quality control program, the purpose of which is to assure that the concrete mix yields the designed strength of concrete when cured. The program should address testing methods such as slump tests, air content tests, destructive and non-destructive testing, and tests for assuring proper use of curing accelerators and other admixtures for attaining designed concrete strengths."

Since the original submission, NIOSH has considered this further. It is assumed that the employer has the responsibility of providing concrete which meets the design requirements. This concrete has a dual function, first to be of sufficient strength to provide for the structural integrity of the finished building and second to be of sufficient strength to withstand the imposed loads during construction of the structure. Naturally, if both functions are fulfilled, the likelihood of a building collapsing should be reduced, and workers will be protected from injury or death. But, how is the contractor/employer to determine the strength of the concrete? Test methods, whether destructive, non-destructive or a combination of both, must be incorporated into the building process. Since this is to be a

performance oriented standard, NIOSH suggests that the concept of a quality control program for concrete be recommended in lieu of specific test methods. Such a program would allow the employer to assure that the concrete is of sufficient strength to maintain structural integrity during construction and to meet the design requirements. How this is done should be left to the employer as long as the methods utilized are those known to yield consistently reliable results.

An article that describes the results of research performed to determine the early age of concrete by the maturity method is attached. Please note that the last paragraph of the article recommends that research is needed to improve this method for determining concrete strengths during the first seven days of aging. This is normally the time frame when the strength is most crucial for rapid construction practices.

Paragraph 8 of Section IV suggests that only wire rope is used in pre- and post-tensioning. This is not true since steel rods are also used; however, there should be little effect on the potential hazards of the operation if either are used. The greatest risk of serious injury is associated with the sudden release of energy from the tensioned element. These elements, rods or wire rope, are oftentimes subjected to loads of 200,000 psi. Should a rope or rod fail and strike an employee, serious injury is likely to occur.

The Division of Safety Research (DSR), NIOSH, published a document entitled Comprehensive Safety Recommendations for the Precast Concrete Products Industry which addresses many of the problems associated with pre-tensioning wire ropes (paragraph (b) on page 48 of the attached document). Recommendations for controlling these associated hazards are contained in paragraph C, entitled "Stressing," on page 76 of the document. In addition to these specific operational hazards, OSHA should consider the additional recommendations contained within the document as they pertain to on-site precasting operations within the construction industry.

Enclosures and/or attachments that are not included are available free of charge from the NIOSH Docket Office (513/533-8450).