

**OCCUPATIONAL SAFETY  
AND HEALTH STANDARDS BOARD**

2520 Venture Oaks, Suite 350  
Sacramento, CA 95833  
(916) 274-5721  
FAX (916) 274-5743  
[www.dir.ca.gov/oshsb](http://www.dir.ca.gov/oshsb)



NOTICE OF PROPOSED MODIFICATIONS TO  
CALIFORNIA CODE OF REGULATIONS

Title 8: Division 1, Chapter 4, Subchapter 4, Article 12,  
Sections 1600-1601 of the Construction Safety Orders.

Pile Driving and Pile Extraction.

Pursuant to Government Code Section 11346.8(c), the Occupational Safety and Health Standards Board (Standards Board) gives notice of the opportunity to submit written comments on the above-named standard in which modifications are being considered as a result of public comments and/or Board staff consideration.

On May 20, 2010, the Standards Board held a Public Hearing to consider revisions to Title 8, Sections 1600 and 1601, of the Construction Safety Orders. The Standards Board received written and oral comments on the proposed revisions. The standards have been modified as a result of these comments and Board consideration.

A copy of the full text of the standard, with the modifications clearly indicated, is attached for your information. In addition, a summary of all written and oral comments regarding the original proposal and staff responses is included.

Any written comments on these modifications must be received by 5:00 p.m. on July 26, 2010, at the Occupational Safety and Health Standards Board, 2520 Venture Oaks Way, Suite 350, Sacramento, California 95833 or submitted by fax at (916) 274-5743 or emailed at [oshsb@dir.ca.gov](mailto:oshsb@dir.ca.gov). The standards will be scheduled for adoption at a future business meeting of the Standards Board.

The Standards Board's rulemaking files on the proposed action are open to public inspection Monday through Friday, from 8:00 a.m. to 4:30 p.m., at the Standards Board's office.

Inquiries concerning the proposed changes may be directed to Marley Hart, Executive Officer at (916) 274-5721.

OCCUPATIONAL SAFETY AND HEALTH  
STANDARDS BOARD

Date: July 8, 2010

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Marley Hart, Executive Officer

**PROPOSED MODIFICATIONS**  
(Modifications are indicated in bold,  
double underline for new language,  
and bold, double strikeout for deleted language.)

**STANDARDS PRESENTATION  
TO  
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

PROPOSED STATE STANDARD,  
TITLE 8, CHAPTER 4

TITLE 8: Division 1, Chapter 4, Subchapter 4. Construction Safety Orders  
Article 12. Pile Driving and Pile Extraction

Amend Section 1600 and add new Section 1600.1 as follows:

§1600. Pile Driving.

~~(a) Site layout. The controlling contractor shall ensure that safe access into and through the site is provided and maintained for the delivery and movement of necessary equipment and material.~~

~~EXCEPTION: This requirement does not apply to roads outside of the construction site.~~

~~(b)~~ (a) A danger zone shall be clearly delineated around the operating hammer where employees involved in cutting, chipping or welding operations shall be prohibited so as to protect them from the hazards of falling objects.

(1) The employer shall establish the danger zone.

(2) The danger zone shall be maintained under the supervision of a competent person.

~~(c)~~ (b) A blocking device or other effective means capable of safely supporting the weight of the hammer shall be provided for placement in the leads under to secure the hammer in the leads and shall be used at all times while when any employees are is working under the hammer.

~~Exception: Where it is necessary for a worker, momentarily, to lean through the leads to spot a pile under hammer, it is not required that the hammer be secured in the leads.~~

~~(d)~~ (c) Pressurized Lines and Hoses. Steam and air hammer hose connections.

(1) All pile driver hose connections including those to pile driver hammers, pile ejectors, or jet pipes shall be securely tethered with an adequate length of at least 1/4 inch (0.635 cm) alloy steel chain having 3,250 pounds (1,500 kg) rated capacity (working load limit), or equivalent strength alloy steel cable to prevent the line from thrashing around in case the coupling becomes disconnected.

(A) ~~(2)~~ Chains or wire rope shall not be shortened with knots, bolts or other makeshift devices.

(2) Steam and compressed air line controls shall consist of two shutoff valves. At least one shutoff valve shall be equipped with a quick-acting lever within easy reach of the pile hammer operator.

~~(e)~~ (d) When used, platforms shall be of sufficient size so that the employee can easily avoid contact with the hammer. It shall be surrounded on all sides, except between the hammer leads, with a railing or guard line 42 to 45 inches in height. Guard lines shall be taut and at least 3/8

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inch wire rope or equivalent. If railings are used, they shall be constructed in accordance with Section 1620.

Exception: Pipe or structural steel railings of equivalent strength may be used.

~~(f)~~ (e) Precautions shall be taken to ensure that objects are secured against wind and accidental displacement, to prevent tools, material, and equipment from falling off elevated platforms. Toeboards shall be installed on all sides of the platform in accordance with Section 1621(b).

~~(g)~~ (f) Access to Pile Leads.

(1) Leads shall be provided with a continuous ladder or horizontal bracing that is uniformly spaced at intervals no greater than 18 inches, and the leads shall be equipped with adequate anchorages rings, or similar attachment points, so that the employee may engage a personal fall protection system to the leads. The personal fall protection system shall comply with the requirements of Article 24.

~~(2) The means of access shall prevent the employee from contacting the pile hammer.~~

~~(3) (2) The operator of the equipment will apply all brakes and necessary safety switches to prevent uncontrolled motion of the equipment before an employee may access the leads.~~

~~(h)~~ (g) Sheet Pile Access.

(1) ~~(g) Stirrups shall be provided for use on sheet piles or a mechanical device shall be used to guide the pile into place.~~ If an employee is required to go aloft on sheet piling, the employee shall use an aerial device or ladder.

Exception: ~~Where it is unsafe to use an aerial device or ladder, a boatswain's chair may be used in accordance with Section 1662.~~

(A) ~~(h) Employee(s) shall not ride the hammer, crane load block or overhaul ball.~~

(B) A crane suspended personnel platform may be used for access if used in accordance with Section 5004.

(2) Sheet piling shall be firmly stabilized before workers are permitted to work on them.

(3) Stirrups shall be provided for use by employees who must take a position on sheet piles.

~~(i)~~ (h) Specific Pile Driving Requirements.

(1) ~~(i) Where work is to be performed, walkways at least 20 inches in width shall be provided across piles or other open work with the exception of those piles on which the driver is standing.~~

(2) Before any type of pile is placed in position for driving, the pile head must be cut square to the driving head and free of concrete spall, steel fragments, or other debris.

(3) ~~(j) Where a drop hammer is used for driving piling other than sheet piling, a driving head or bonnet shall be provided to bell the head of the pile and hold it true in the leads.~~

~~(j)~~ (i) Pile Hammer Requirements.

(1) General.

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(A) The pile hammer, clamp, power unit and supply hoses shall be inspected in accordance with their manufacturer's recommendations. Associated equipment such as the couplings, support and lifting equipment, rigging and retaining bolts shall be inspected before each shift and periodically during use.

(B) Driving heads shall be kept aligned with the pile and pile hammer as a pile is driven.

(2) Vibratory pile hammers.

(A) When driving with a crane-suspended vibratory pile hammer, the person operating the remote on/off clamp switch shall be in direct visual contact with the signal person.

(B) The exciter (vibratory pile hammer) shall not be unclamped from the pile when there is any line pull on the suspension or when the pile hammer is still vibrating.

~~(j)~~ (i) Ring buoys shall be provided in accordance with Article 13 and located where readily available at intervals not exceeding 200 feet on all structures over water under the course of construction.

Where employees are concentrated in groups, there shall be additional ring buoys consisting of not less than 1 additional buoy for each 25 employees in that area. Portable standards or equivalent means to hold the ring buoys in plain view shall be provided. Life saving boats shall be provided in accordance with Article 13.

~~(k)~~ (l) All floating rigs, with the exception of small work rafts or pontoons, shall be equipped with at least 2 ring buoys.

~~(m)~~ (l) In every crew there shall be a designated signaler, and the engine or winch operator shall receive signals from no other except, that when an employee is aloft, the hammer shall not be moved except on the signal of the employee aloft.

Note: For recommended standard hand signals, see Plate C-11.

~~(n)~~ (m) All deck engines, not operated by an operator on the throttle sides, shall be equipped with a cross extension of the throttle that is within the reach of the spool tender.

~~(o)~~ (n) Hoist Drums.

(1) Every hoisting drum used on a pile driver that uses a pawl dog and ratchet arrangement to hold it in position shall be equipped with an adequate dog effective pawl and ratchet capable of holding the rated load capacity when it is suspended.

(2) This pawl dog shall be readily visible from the engine operator's station or shall be provided with a directly connected and positive telltale device that will be visible.

(3) ~~(p)~~ No arrangement of counterweights or springs on the dog shall be permitted which will allow the dog to be automatically disengaged. Pawls which automatically disengage either by relieving the load or rotating the drum are prohibited.

~~(p)~~ (o) Pile Leads.

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~~(1) (e)~~ Stop blocks shall be provided for the leads to prevent the hammer from being raised against the head block.

~~(2)~~ Guards or devices shall be provided across the top of the head block to prevent the cable from jumping out of the sheaves.

~~(3) (f)~~ When the leads must be inclined in the driving of batter piles, provisions shall be made to stabilize the leads.

~~(4)~~ Pile gates, **when used**, shall be of a size sufficient to secure piling at the bottom of the leads during driving operations.

~~(s)~~ Steam line controls shall consist of two shutoff valves, one of which shall be a quick-acting lever type within easy reach of the hammer operator.

~~(e) (p)~~ Pile Driving Rig Stability.

~~(1) (t)~~ Guys, outriggers, thrustouts, or counter-balances shall be provided as necessary to maintain stability of pile driver rigs.

~~(2)~~ Hammers shall be lowered to the bottom of the leads while the pile driver is being moved (traveling).

~~(3) (u)~~ All employees shall be kept clear when piling is being hoisted into the leads.

~~(t) (q) (v)~~ When steel tube (**pipe**) piles are being “blown out,” employees shall be kept well beyond the range of falling materials.

~~(e) (r) (w)~~ When driving jacked piles, all access pits shall be provided with ladders and bulkheaded curbs to prevent material from falling into the pit.

Note: Section 5158 of the General Industry Safety Orders prescribes the minimum standards for preventing employee exposure to dangerous air contamination and/or oxygen deficiency in confined spaces.

~~(t) (s) (x)~~ Hoisting of piling shall be done by hooks provided with a means to prevent accidental disengagement or a shackle shall be used in place of a hook.

~~(u) (t) (y)~~ Taglines shall be used for controlling unguided piles and free hanging (flying) hammers.

~~(z)~~ Hammers shall be lowered to the bottom of the leads while the pile driver is being moved.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Add new Section 1600.1 as follows:

§1600.1 Pile Extraction.

(a) The rated capacity of the hammer's suspension shall not be exceeded. The manufacturer's recommendations for extracting piling shall be observed at all times.

~~(b) When piles are extracted by drop impact, the connection between the pile hammer and the piling shall be sound and shall be inspected often during the extraction process. The provisions of Subsection 1600(i) shall apply to the extraction process.~~

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Amend Section 1601 as follows:

§1601. Methods of Unloading and Storing Piles.

Piles shall be unloaded and stored in a controlled manner so that employees are not exposed to the hazard of rolling or falling piles.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

## **SUMMARY AND RESPONSE TO COMMENTS**

## SUMMARY AND RESPONSE TO ORAL AND WRITTEN COMMENTS

### I. Written Comments

Mr. Pat Karinen, Senior Field Representative, Pile Drivers Local Union #34, by letter dated April 19, 2010.

#### Comment No. 1:

Subsection 1600(g), Access to Piles, Subsection (g)(2), reads: “The means of access shall prevent the employee from contacting the pile hammer.” The commenter reasons that this proposed change is impractical. The primary reason an employee needs to climb the leads is to fuel and oil or grease the hammer, adjust the hammer settings, or rig-in or attach the hammer to the lines from the crane that is lifting the hammer. Thus he recommends that this subsection be removed.

#### Response:

The Board notes that subsection (g)(3) provides that the operator of the equipment must apply all brakes and necessary safety switches to prevent uncontrolled motion of the equipment before an employee may access the leads, thus protecting the employee who must access the leads to perform the tasks listed by Mr. Karinen. The Board therefore accepts this comment and proposes to delete subsection (g)(2) from the proposal [Note: Due to another comment, Subsection 1600(g) is being renumbered as Subsection 1600(f) and subsection (g)(3) will be renumbered as subsection (f)(2)].

#### Comment No. 2:

Section 1600(p)(4) reads: “Pile gates shall be of a size sufficient to secure piling at the bottom of the leads during driving operations.” The commenter requests that the provision be modified to “Pile gates when used...” He opined that, in some pile driving operations, a pile gate is more of a hindrance than a help, specifically, when fixed leads are used and a pre-drilled hole is used to locate the pile. He observed that in this case a gate is just one more piece of iron that an employee has to be aware of when lofting and driving the pile.

#### Response:

The Board accepts this comment and proposes to modify the proposal accordingly. [Note: Due to another comment, Subsection 1600(p) is being renumbered as Subsection 1600(o)]

#### Comment No. 3:

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Subsection 1600(r) reads: “When steel tube piles are being “blown out,” employees shall be kept well beyond the range of falling materials.” The commenter states that this provision should be clarified. He speculates that “steel tube pile” may refer to a large diameter pipe pile. He states that he has used an air lift to clean out a large diameter pipe pile, and in that case it is a “no brainer” to keep employees clear of debris.

Response:

This subsection is verbatim from the existing standard (no changes were originally proposed). It is also verbatim of the federal standards [29 CFR 1926.603(c)(4)]. A search of the Internet indicates that the term “tube pile” is more commonly used in Europe and appears to be synonymous with “pipe pile” in the United States. Thus the commenter’s observation of using an air lift to clean-out large diameter pipe is an example of the operation referred to by this provision. The Board therefore accepts this comment to the extent that it proposes an amendment to clarify that “tube pile” is the same as “pipe pile”. [Note: Due to another comment, Subsection 1600(r) has been renumbered as Subsection 1600(q)]

Comment No. 4:

Subsection 1600(u) reads: “Taglines shall be used for controlling unguided piles and free hanging (flying) hammers.” The commenter opines that a tag line attached to a pile in the process of lofting it into the leads would create more problems than it would solve, because an employee would have to access the leads to untie the tag line after the pile was lofted. The commenter therefore, says that this portion of the proposal should be deleted.

Response:

This provision is an existing provision (no changes were proposed), and it is also found in ANSI/ASSE A10.19, Section 11.23. Furthermore, it refers only to “unguided piles and free hanging (flying) hammers.” Thus it would not apply to any operations where the pile or hammer is lofted in a controlled manner. This section was available for discussion at the advisory committee;<sup>1</sup> however, participants had no comments on it. Since this provision has been in the current standard for a number of years without any apparent problem, the Board declines to make changes to this section at this time. [Note: Due to another comment, Subsection 1600(u) has been renumbered as Subsection 1600(t)]

The Board thanks Mr. Karinen for his interest and participation in the rulemaking process.

II. Oral Comments

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<sup>1</sup>Two members of Pile Drivers Local Union #34 were in attendance at the advisory committee.

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Oral comments received at the May 20, 2010, Public Hearing in San Diego, California.

Mr. Pat Karinen, Senior Field Representative, representing Pile Drivers Local Union #34.

Comment:

Mr. Karinen summarized the comments he had presented in his letter to the Board dated April 19, 2010.

Response:

See responses to Mr. Karinen's written comments above.

The Board thanks Mr. Karinen for appearing at the public hearing to express his concerns regarding the proposal and for his interest in the rulemaking process.

Mr. Gary Perlichek, Vice President, representing Foundation Pile Driving Contractors.

Comment No. 1:

Mr. Perlichek expressed his agreement with Mr. Karinen's concerns.

Response:

Mr. Perlichek's concerns are noted and have been addressed as indicated in the response to Mr. Karinen's written comments.

Comment No. 2:

The commenter requested clarification of Subsection 1600(p)(3), which provides that when the leads must be inclined in the driving of batter piles, provisions shall be made to stabilize the leads. He requested clarification on how the bottom of the leads are to be planted on the ground to stabilize them for driving batter piles. He stated that most batter piles are driven with swinging leads, so they are just hanging off a line.

Response:

This subsection is verbatim of federal OSHA Standard 29 CFR 1926.603(a)(7), and it is existing verbiage that is not proposed to be amended. It is a performance standard and therefore does not give specific means of stabilizing the batter pile. A search of the Internet indicates there are a

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number of ways of stabilizing the pile, often dictated by site conditions. A proposal to amend this subsection was discussed by the advisory committee;<sup>2</sup> however, the consensus of the committee was to leave the existing verbiage unchanged. Therefore, the Board declines to make changes to this subsection at this time. [Note: Due to another comment, Subsection 1600(p) has been renumbered as Subsection 1600(o)]

Comment No. 3:

The commenter noted that subsection 1600(q)(3) provides that all employees shall be kept clear when piling is being hoisted into the leads. However, he stated that it is necessary to have at least one person or sometimes two people to handle the pile and lock it. He requested that the subsection be amended to permit this.

Response:

This subsection is verbatim of federal OSHA Standard 29 CFR 1926.603(c)(2), and it is existing verbiage that is not proposed to be amended. Subsection 1600(q) was discussed at the advisory committee, and a minor modification was made to subsection 1600(q)(2) for clarity; however, the committee did not indicate any need to modify subsection (q)(3). Board staff has discussed this comment with Mr. Perlichek and determined that his concern was that employees need to approach the leads to make final adjustments to lock the pile in place once it has been lofted into the leads. The proposed provision does not prevent this activity. Instead it precludes approaching the leads only while the pile is being lifted. Therefore, the Board finds no necessity to make changes to this subsection at this time. [Note: Due to another comment, Subsection 1600(q) has been renumbered as Subsection 1600(p)]

Comment No. 4:

With reference to Subsection 1600.1(b) regarding extraction of piles by drop impact, the commenter asked for clarification/definition of the term “drop impact.”

Response:

Board staff has discussed this comment with the commenter. As noted previously, in order to extract piles it is first necessary to break the surface tension the pile has with the surrounding material. This is often done using drop impact or vibratory forces.

Subsection 1600.1(b) was originally proposed to provide that when piles are extracted by drop impact, the connection between the pile hammer and the piling should be sound. The intent was

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<sup>2</sup> Advisory committee attendance included two representatives from Foundation Pile.

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to assure that the drop impact would not deflect off the pile to be loosened and extracted. Board staff has determined that both drop impact and vibratory energy can be used to break surface tension in order to extract piles. The subject of controlling drop impact and vibratory energy is already covered in Subsection 1600(i); therefore Board staff proposes to cross reference to this Subsection for the pile extraction process.

The Board thanks Mr. Perlichek for his participation in the rulemaking process.

Comment by Board Member Bill Jackson:

Subsection 1600(a), Site Layout, provides that the controlling contractor is to ensure that safe access into and through the site is provided and maintained for the delivery and movement of necessary equipment and material. Mr. Jackson was of the opinion that the term “controlling contractor” should be defined in order to be clear to the regulated public. He noted that there is no federal counterpart for this requirement, and that there are occasions where pile driving is done before the general contractor is on-site to supervise the work. He felt that the proposed verbiage could be interpreted to place responsibility for site access on a party who may not be involved in pile driving at all.

Response:

This proposed subsection was developed by the advisory committee after considerable discussion. It is modeled after Section 1710 Structural Steel Erection, subsection (c)(3), Site Layout. Concerns expressed at the advisory committee included:

- Responsibility for pile driving work that may be done in environmentally sensitive areas.
- Weather can change site conditions and access, particularly when mobilized for extended periods.
- The proposed verbiage covers site access, the need for which is not just limited to the pile driving contractor, but to others as well.
- How this would be implemented in the field.

A plurality (although not a consensus) of advisory committee members favored retaining this proposal, and Board staff decided to leave this section in the draft to obtain public comment. Mr. Jackson’s comment serves to reinforce concerns expressed at the advisory committee, and raises questions about how this provision might be applied in the field. Comments received at the advisory committee indicate that agreement on who is responsible for providing and maintaining site access can usually be reached among the affected parties, and the Board is therefore persuaded that this subsection does not merit further consideration. The Board accepts this comment and proposes to delete subsection (a). This will result in all subsequent sections of Section 1600 being renumbered.