

State of California
Department of Industrial Relations
Memorandum



To: Marley Hart, Executive Officer
Occupational Safety and Health Standards Board
2520 Venture Oaks Way, Suite 350
Sacramento, CA 95833

Date: July 27, 2016

From: Juliann Sum, Chief
Division of Occupational Safety and Health
Department of Industrial Relations

A handwritten signature in black ink, appearing to read "Juliann Sum".

Re: Petition No. 559 for amendment of Title 8 Section 1541.1

1.0 INTRODUCTION AND BACKGROUND

On April 29, 2016, the Division of Occupational Safety and Health (Cal/OSHA) received a petition from Daniel Gallet (petitioner) to amend Title 8 of the Construction Safety Orders contained in the California Code of Regulations. The petitioner requests a change to Title 8 Article 6, *Excavations*, section 1541.1, *Requirements for Protective Systems*. The section contains requirements for the design, installation, use and removal of protective systems to prevent excavation cave-ins. The following is an evaluation of the petitioner's request.

2.0 PETITIONER'S REQUESTS

The petitioner is requesting additions to subsections 1541.1(d)(1) and (e)(1). Subsection (d)(1) currently requires that materials and equipment used for protective systems be free of damage that may impair their proper function. Subsection (e)(1) contains general requirements for the installation and removal of supports for excavation protective systems. These requirements currently include the proper securing and installation of protective systems, prohibition against overloading, precautions for the temporary removal of system supports, and progression of support removal from the bottom to the top of excavations, along with simultaneous backfilling upon removal of supports.

The proposed amendment to subsection 1541.1(d)(1) would prohibit sheeting composed of plywood or similar material and used in excavation shoring systems from having holes unless a registered engineer verified that the bending strength of the sheeting material would not be reduced below the values listed in Appendix D of section 1541.1.¹

¹ Appendix D of section 1541.1 does not contain bending strength requirements for plywood or equivalent sheeting used in excavation protection systems. See part 10.1 of this evaluation.

The petitioner's proposed amendment to subsection 1541.1(e)(1) includes the following:

- Require that all devices used to lift excavation shoring components comply with the American Society of Mechanical Engineer (ASME) B30.20 standard, entitled "*Below the Hook Lifting Devices*."
- Prohibit the use of damaged or unrated ropes to lift excavation shoring system components.
- Prohibit the use of chains to lift malleable shoring components.
- Prohibit the use of pallet pullers² to lift shoring components during installation and removal from excavations.

3.0 PROPOSED ADDITIONS TO SECTION 1541.1

Additions and renumbering of existing section 1541.1, proposed by the petitioner, are shown below in underline strikeout format. The petitioner has not requested that any existing language be deleted.

Subchapter 4. Construction Safety Orders
Article 6. Excavations
§1541.1. Requirements for Protective Systems

* * * * *

(d) Materials and equipment.

(1) Materials and equipment used for protective systems shall be free from damage or defects that might impair their proper function. The addition of holes in plywood or similar material may weaken it from manufactures specifications and are prohibited unless a registered professional engineer has verified the material meets the minimum bending strength listed in appendix D.

(2) Manufactured materials and equipment used for protective systems shall be used and maintained in a manner that is consistent with the recommendations of the manufacturer, and in a manner that will prevent employee exposure to hazards.

(3) When material or equipment that is used for protective systems is damaged, a competent person shall examine the material or equipment and evaluate its suitability for continued use. If the competent person cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then such material or equipment shall be removed from service, and shall be evaluated and approved by a registered professional engineer before being returned to service

² A pallet puller is a device designed to pull pallets horizontally and are not related in any way to plywood pullers

(e) Installation and removal of supports.

(1) General.

(A) Members of support systems shall be securely connected together to prevent sliding, falling, kick outs, or other predictable failure.

(B) Support systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.

(C) All shoring installation/removal lifting devices shall be in compliance with the ASME B30.20, and the tabulated data shall reflect a maximum rated lifting capacity and shall not be exceeded.

(D) The use of damaged or unrated ropes for lifting are prohibited.

(E) The use of chains alone to lift malleable shoring material is prohibited due to the increasing possibility of kick outs, falling loads and damage to the material.

(F) The use of Pallet Pullers for lifting are prohibited, as they are designed specifically for horizontal pulling on a smooth, flat surface and may present an unnecessary hazard to employees.

~~(C)~~(G) Individual members of support systems shall not be subjected to loads exceeding those which those members were designed to withstand.

~~(D)~~(H) Before temporary removal of individual members begins, additional precautions shall be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system.

~~(E)~~(I) Removal shall begin at, and progress from, the bottom of the excavation. Members shall be released slowly so as to note any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation.

~~(F)~~(J) Backfilling shall progress together with the removal of support systems from excavations.

(2) Additional requirements for support systems for trench excavations.

(A) Excavation of material to a level no greater than 2 feet below the bottom of the members of a support system shall be permitted, but only if the system is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

(B) Installation of a support system shall be closely coordinated with the excavation of trenches.

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4.0 APPLICABLE TITLE 8 REGULATIONS

In addition to subsections 1541.1(d) and (e) above, the following regulations are applicable to the lifting of excavation shoring components with a sling (rope, wire rope, strap, chain, web, mesh or similar device).

Subchapter 4. Construction Safety Orders
Article 10. Haulage and Earth Moving
§1593. Haulage Vehicle Operation.

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(n) The use, care and maintenance of slings used in lifting suspended loads with excavators, loaders and similar equipment shall comply with the requirements of Article 101 of the General Industry Safety Orders.

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Subchapter 7. General Industry Safety Orders
Group 13. Cranes and Other Hoisting Equipment
Article 101. Slings
§5040. Scope.

This Article applies to slings used in conjunction with material handling equipment for the movement of material by hoisting. The types of slings covered are those made from alloy steel chain, wire rope, metal mesh, natural or synthetic fiber rope (conventional three strand construction), and synthetic web (nylon, polyester, and polypropylene).

EXCEPTION: Slings made from materials other than those detailed in this section shall be used only in accordance with the manufacturer's recommendations.

§5042. Safe Operating Practices.

(a) Whenever any sling is used, the following practices shall be enforced:

- (1) Slings that are damaged or defective shall not be used.
- (2) Chain or wire rope slings shall not be shortened with knots or bolts or other makeshift devices.
- (3) Slings shall not be kinked, or knotted.
- (4) Slings shall not be loaded in excess of their rated capacities as prescribed by the sling manufacturer on the identification markings permanently affixed to the sling.
- (5) Slings used in a basket hitch shall have the loads balanced to prevent slippage.
- (6) Slings shall be set to avoid slippage.
- (7) Slings shall be padded or protected from the sharp edges of their loads.

- (8) Suspended loads shall be kept clear of all obstructions.
- (9) All employees shall be kept clear of loads about to be lifted and of suspended loads. (See Section 5002).
- (10) Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load.
- (11) Shock loading is prohibited.
- (12) A sling shall not be pulled from under a load when the load is resting on the sling and damage to the sling may result.

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§5047. Natural and Synthetic Fiber Rope Slings.

(a) Sling Use.

(1) Fiber rope slings made from conventional three strand construction fiber rope shall not be used with loads in excess of the rated capacities prescribed in Tables S-18 through S-21.

(2) Fiber rope slings shall have a diameter of curvature meeting at least the minimums specified in Figures S-4 and S-5.

(3) Slings not included in these Orders shall be used only in accordance with the manufacturer's recommendations.

(4) Natural and synthetic fiber rope slings shall not be used for suspending personnel platforms.

(b) Safe Operating Temperatures. Natural and synthetic fiber rope slings, except for wet frozen slings, may be used in a temperature range from minus 200 F to plus 1800 F without decreasing the working load limit. For operations outside this temperature range and for wet frozen slings, the sling manufacturer's recommendations shall be followed.

(c) Splicing. Spliced fiber rope slings shall not be used unless they have been spliced in accordance with the following minimum requirements and in accordance with any additional recommendations of the manufacturer:

(1) In manila rope, eye splices shall consist of at least three full tucks, and short splices shall consist of at least six full tucks, three on each side of the splice center line.

(2) In synthetic fiber rope, eye splices shall consist of at least four full tucks, and short splices shall consist of at least eight full tucks, four on each side of the center line.

(3) Strand end tails shall not be trimmed flush with the surface of the rope immediately adjacent to the full tucks. This applies to all types of fiber rope and both eye and short splices. For fiber rope under one inch in diameter, the tail shall project at least six rope diameters beyond the last full tuck. For fiber rope one inch in diameter and larger, the tail shall project at least six inches beyond the last full tuck. Where a projecting tail interferes with the use of the sling, the tail shall be tapered and spliced into the body of the rope using at least two additional tucks (which will require a tail length of approximately six rope diameters beyond the last full tuck).

(4) Fiber rope slings shall have a minimum clear length of rope between eye splices equal to 10 times the rope diameter.

(5) Knots shall not be used in lieu of splices.

(6) Clamps not designed specifically for fiber ropes shall not be used for splicing.

(7) For all eye splices, the eye shall be of such size to provide an included angle of not greater than 60 degrees at the splice when the eye is placed over the load or support.

(d) End Attachments. Fiber rope slings shall not be used if end attachments in contact with the rope have sharp edges or projections.

(e) Removal from Service. Natural and synthetic fiber rope slings shall be immediately removed from service if any of the following conditions are present:

- (1) Abnormal wear;
- (2) Powdered fiber between strands;
- (3) Broken or cut fibers;
- (4) Variations in the size or roundness of strands;
- (5) Discoloration or rotting;
- (6) Distortion of hardware in the sling.

(f) Repairs. Repairs shall only be made by the manufacturer or equivalent entity. Only fiber rope slings made from new rope shall be used. Use of repaired or reconditioned fiber rope slings is prohibited.

(g) Employers must ensure that natural and synthetic fiber-rope slings:

(1) Have permanently affixed and legible identification markings as prescribed by the manufacturer, and that indicate the recommended safe working load for the type(s) of hitch(es) used, the angle upon which it is based, type of fiber material, and the number of legs if more than one; and

(2) Not be used without affixed and legible identification markings as required by subsection (g)(1) of this section.

(13) Tables S-1 and S-2 shall be used to determine the maximum safe working loads of various sizes of wrought iron and alloy steel chains and chain slings, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products. Proof coil steel chain, also known as common or hardware chain, or other chain not recommended for slinging or hoisting by the manufacturer, shall not be used for hoisting purposes.

(14) Wrought iron chains in constant use shall be annealed or normalized at intervals not exceeding 6 months when recommended by the manufacturer. The chain manufacturer shall be consulted for recommended procedures for annealing or normalizing. Alloy chains shall not be annealed.

(15) Employers shall not use slings without affixed and legible identification markings.

5.0 HAZARDS TO EMPLOYEES WORKING IN EXCAVATIONS

Hazards to workers working in excavations are well documented in Cal/OSHA investigative records. Employees may suffer serious injuries or death when the sidewalls of an excavation collapse and partially or completely bury the employee. Employees may also be exposed to the hazards of spoil materials, equipment and overhead loads falling on them from outside of the excavation. Additionally, there are potential environmental hazards such as water intrusion and exposure to hazardous gases contained within the soil. Potential injuries include:

1. Crushing
2. Asphyxiation
3. Suffocation
4. Fractures
5. Amputations
6. Contusions
7. Hypoxemia

6.0 APPLICABLE FEDERAL OSHA REGULATIONS

The safety requirements for excavations are regulated by Federal OSHA by the Federal Code of Federal Regulations section 1926.652(e) under subpart P of the Construction Safety Orders.

29 CFR Part 1926. Safety and Health Regulations for Construction

Subpart P. Excavations

* * * * *

§1926.652. Requirements for Protective Systems

1926.652(e) Installation and removal of support

1926.652(e)(1) General.

1926.652(e)(1)(i)

Members of support systems shall be securely connected together to prevent sliding, falling, kickouts, or other predictable failure.

1926.652(e)(1)(ii)

Support systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.

1926.652(e)(1)(iii)

Individual members of support systems shall not be subjected to loads exceeding those which those members were designed to withstand.

1926.652(e)(1)(iv)

Before temporary removal of individual members begins, additional precautions shall be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system.

1926.652(e)(1)(v)

Removal shall begin at, and progress from, the bottom of the excavation. Members shall be released slowly so as to note any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation.

1926.652(e)(1)(vi)

Backfilling shall progress together with the removal of support systems from excavations.

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7.0 APPLICABLE CONSENSUS STANDARDS

7.1 ANSI/ASSE A10.12 – 1998

The American National Standards Institute (ANSI) and American Society of Safety Engineers (ASSE) address the materials and equipment for and the installation and removal of excavation protective systems under sections 3.4 and 3.5 of ANSI/ASSE 10.12. The 1998 edition of this standard was the most recent version identified during the course of this evaluation and is not incorporated by referenced in Title 8 regulations.

ANSI 10.12 – 1998 Safety Requirements for Woodworking Machinery – American National Standard for Construction and Demolition Operations

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3.4 Materials and Equipment

3.4.1 Materials and equipment used for protective systems shall be free from damage or defects that might impair their proper function.

3.4.2 Manufactured materials and equipment used for protective systems shall be used and maintained in a manner that is consistent with the recommendations of the manufacturer, and in a manner that will prevent employee exposure to hazards.

3.4.3 When material or equipment that is used for protective systems is damaged, a competent person shall examine the material or equipment and evaluate its suitability for continued use. If the competent person cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then such material or equipment shall be removed from service, and shall be evaluated and approved by a registered professional engineer or the manufacturer before being returned to service.

3.5 Installation and Removal of Support

3.5.1 General Requirements

3.5.1.1 Members of support systems shall be securely connected together to prevent sliding, falling, kickouts, or other predictable failure.

3.5.1.2 Support systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.

3.5.1.3 Individual members of support systems shall not be subjected to loads exceeding those which those members were designed to withstand.

3.5.1.4 Before temporary removal of individual members begins, additional precautions shall be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system.

3.5.1.5 Removal shall begin at, and progress from, the bottom of the excavation. Members shall be released slowly so as to note any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation.

3.5.1.6 Backfilling shall progress together with the removal of support systems from excavations, except when an excavation is required to be kept open for inspection or testing purposes.

* * * * *

7.2 ASME B30.20 – 2013

ASME B30.20, “*Below the Hook Lifting Devices*,” is a consensus standard governing the classification, marking, construction, installation, inspection, testing, maintenance, and operation of structural, mechanical and other types of lifting devices. The standard is not currently incorporated into Title 8. However, the petitioner proposes that devices which lift components of shoring systems, comply with the standard. The 2013 edition of ASME B30.20 is included in this evaluation as Attachment 1.

7.3 ASME BTH-1 – 2005

ASME BTH-1 is incorporated by reference within ASME B30.20 for the design of below-the-hook lifting devices. Specifically, the ASME BTH-1 standard describes minimum structural and mechanical design and electrical component selection criteria for the lifting devices within the scope of ASME B30.20. ASME BTH-1 is not incorporated by reference within Title 8 regulations. The 2005 version of ASME BTH-1 is included in this evaluation as Attachment 2.

8.0 BACKGROUND ON PETITIONER AND DESCRIPTION OF THE PLYWOOD PULLER AND ALTERNATIVE DEVICES

8.1 Petitioner’s Background

The petitioner is a co-owner, with his father David Gallet, of Plywood Pullers LLC, located in Corona, CA. Plywood Pullers LLC markets and sells a friction gripping device of the same name designed for lifting and moving plywood and similar materials. Specifically, the device has been designed to remove sheeting from excavations with the use of a backhoe, excavator, crane or other lifting equipment.

8.2 Plywood Pullers Device

The Plywood Pullers device (Figure 1) consists of three major components; a lifting chain (tether) with a connected hook equipped with a safety latch, a teardrop-shaped pressure assembly, and a u-shaped gripping assembly equipped with gripping teeth. A bolted connection holds the pressure and gripping assemblies together and allows the pressure assembly to pivot in the gripping assembly during use. The tether is welded to the base of the pressure assembly and is threaded through a tongue located on the gripping assembly. An operating handle is also incorporated on the pressure assembly that allows for the device to be manually opened and closed to secure and release the sheeting material. The pressure and gripping assemblies are manufactured for Plywood Pullers by a welding company located in Hesperia, CA. The other components of the

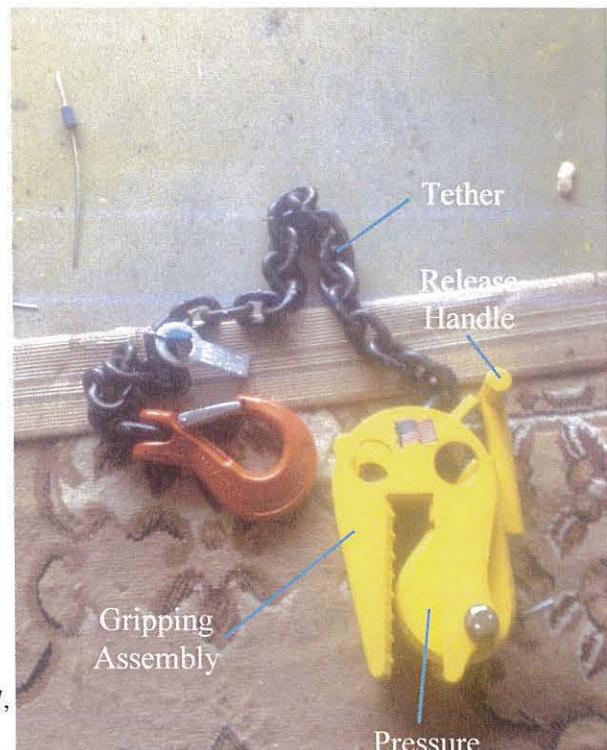


Figure 1. Plywood Pullers Lifting Device

8.3.2 Camlok TSB series Non-Marking Clamp

This TSB lifting clamp, manufactured in the United Kingdom by Camlok, is very similar in design to the Tractel Topal device. Like the Topal clamp, the Camlok device incorporates a lifting chain and flat clamping plate connected to an L-shaped lever assembly. One minor difference between the two devices is the reeving of the lifting chain. While the chain of the Tractel clamp is reeved through only one roller, the Camlock device lifting chain passes through two slotted rollers before terminating at the lever pressure assembly. Unlike the Topal and Plywood Pullers devices, the TSB clamp is equipped with a pressure assembly release lever attached to a shaft that passes through the gripping assembly rather than being attached directly to the pressure assembly. The lifting capacities of the TSB clamp models range from 44 to 2750 pounds and cost approximately \$600 to \$800. Additional information for the Camlok TSB series device is available at:

<http://www.camlok.co.uk/products.aspx?id=6289&pid=6151&tid=6122>



8.3.3 Terrier TNMK series

The TNMK series lifting clamp manufactured by Terrier based in the Netherlands. This device is very similar in design to the Camlok TSB clamp with the exception of the lifting chain reeving. While the Camlok TSB clamp utilizes two grooved rollers, the Terrier device utilizes only one as with the Plywood Pullers and Tractel devices. This device also incorporates a release lever similar to the Camlok device. Rated lifting capacities of the TNMK series lifting clamp models range from 1100 to 6600 pounds and are sold for approximately \$700 to \$1800. Additional information for this device is available at:

<http://terrierclamps.com/products/non-marketing-lifting/tnmk-stnmk-tnmk>



8.3.4 Crosby IPNM10 series

The IPNM10 series of lifting clamps differ from the aforementioned devices in that it does not utilize a lifting chain to actuate the pressure assembly. Instead, this device incorporates a cam system actuated by the lifting ring bar to apply pressure to the clamp. The mechanism of the release lever of this device also incorporates a pretension locking feature that secures the clamp in place prior to a vertical lifting force being applied. The IPNM10 series clamps are labeled as meeting the requirements of ASME B30.20 and have lifting capacities that range from 1000 to 4000 pounds. The cost of these devices ranges from \$1000 to \$1400. Additional information for this device is available at:

<http://www.thecrosbygroup.com/products/lifting-clamps/vertical/non-marring/crosby-ipnm10-vertical-lifting-clamps/>



9.0 PETITIONER'S BASIS FOR NEW REGULATION

9.1 Conference with the petitioner

A teleconference with the petitioner and his father was held on May 20, 2016 at the Cal/OSHA Santa Ana office and the Sacramento Standards Board office to discuss the specifics of the petition that were not included within the original application. During the conference, the petitioner opined that the current language of Title 8 subsections 1541.1(d)(1) and (e)(1) do not adequately protect workers while installing and removing sheeting of excavation protective systems. In support of this assertion, the petitioner drew on the experience of his father who has worked in the construction industry for approximately 30 years. According to the petitioner, the current practices commonly employed for removing protective system sheeting expose workers to many hazards that do not represent violations of current Title 8 regulations.

9.2 Title 8 Section 1541.1(d) – Alteration of sheeting

The petitioner believes that, although section 1541.1(d) prohibits the use of damaged or defective excavation protection equipment, the alteration of such equipment is not addressed. Specifically, the petitioner refers to making holes in plywood and similar materials used for sheeting. Such alteration, the petitioner explains, is performed in order to accommodate the installation of ropes that are used to lift the sheeting from the excavation. This practice, the petitioner contends, can not only present tripping hazards from the lifting ropes, but the holes may reduce the strength of the material so that it no longer meets manufacturer's specifications or compliance with the bending strengths described in Appendix D of section 1541.1.³ Such a situation, he asserts can create the hazard of raveling of the soil in an excavation in the event that the sheeting fails. Introduction of the proposed language would, according to the petitioner, eliminate these hazards by prohibiting holes in sheeting used for excavation protective systems.

9.3 Title 8 Section 1541.1(e)(1) – Lifting equipment

The petitioner asserts that the current requirements of section 1541.1(e)(1) do not address several hazards of installing and removing sheeting material. The first of these hazards argued by the petitioner is the potential failure of lifting equipment due to inadequate design, construction and/or capacity.

9.3.1 Proposed section 1541.1(e)(1)(C) - ASME B30.20 Compliance

The current standard, the petitioner contends, does not require lifting devices to comply with the ASME B30.20 consensus standard. During the May 20th meeting, the petitioner elaborated that it was the intention of the petition to include only the construction and testing portions of the ASME B30.20 standard. A particular edition of the ASME B30.20 standard was not specified by the petitioner. The inclusion of this requirement, according to the petitioner, would enhance safety of workers by reducing the failure of devices that are of inadequate design. During the May 20th meeting, the petitioner elaborated that it was the intent of the proposal that nylon ropes and pallet pullers also need to meet ASME B20.20 requirements, if used during the lifting of shoring components.

³ Appendix D of section 1541.1 does not contain bending strength requirements for plywood sheeting in excavation protection systems. See part 10.1 of this evaluation.

9.3.2 Proposed section 1541.1(e)(1)(D) - Unrated and damaged lifting ropes

The petitioner also believes that section 1541.1(e)(1) does not require lifting devices to have assigned rated capacities based on tabulated data nor does it contain a prohibition to exceed such capacities. The lack of this requirement, the petitioner contends, creates the potential of a lifting device failure when they are loaded beyond their ultimate strength exposing workers to the hazards of falling loads. The petitioner noted that this is of particular concern because it is not always possible to determine the weight of plywood sheeting upon removal due to increased water content and soil that may cling to the sheeting.

Additionally, the petitioner asserts that subsection 1541.1(e)(1) does not contain a prohibition on the use of damaged ropes for lifting of excavation protective systems. During the May 20th meeting, the petitioner added that knots are often required to be tied in the ropes when inserted through holes in the sheeting as discussed in part 9.2 of this evaluation, thereby reducing the lifting capacity of the rope. Allowing unrated or damaged ropes, according to the petitioner, creates potential hazards to workers from rope failure during lifting operations. Including the proposed prohibition on use of unrated or damaged ropes would, according to the petitioner, enhance worker safety by reducing the risk of falling loads due to overloading and lifting rope failure.

9.3.4 Proposed section 1541.1(e)(1)(E) - Prohibit use of lifting chains without accessory devices

The petitioner asserts that section 1541.1(e)(1) does not address hazards created by the use of lifting chains to install and remove sheeting made of “*malleable*” material. During the May 20th meeting, the petitioner explained that the term malleable was meant to refer to plywood sheeting. Steel lifting chains, according to the petitioner, are often utilized as slings to remove sheeting by wrapping them around sheeting in a choker hitch configuration⁴.

This operation, the petitioner asserts, can create three significant hazards. One of these hazards is the potential for the sheeting to slip from the chain while lifting, exposing employees to a falling load. Secondly, lateral forces on the load created by the choked chain, according to the petitioner, can damage the sheeting during lifting operations, reducing its strength. Lastly, the petitioner asserts that, because the sheeting must be choked by the chain near its center of gravity, the bottom of the sheeting will often “kick out” at the bottom when the load tilts from the vertical position when lifted. Workers may be struck by the sheeting as it is lifted or crushed or pinned between the sheeting and structures such as piping in the excavation.

The petitioners’ proposed subsection, 1541.1(e)(1)(E), would prohibit for the use of chains in a choker hitch to lift sheeting and, according the petitioner, mitigate or eliminate the hazards described above by requiring the sheeting to be lifted near the top with an accessory device.

9.3.5 Proposed section 1541.1(e)(1)(F) - Use of pallet pullers

Finally, the petitioner asserts that Title 8 section 1541.1(e)(1) does not address the hazards created by the use of pallet pullers (Figure 2) for the installation and removal of excavation sheeting. Pallet pullers, according to the petitioner, are commonly used to install and remove

⁴ A choker hitch is sling configuration where the sling forms a noose around the load that tightens as the load is lifted.

plywood sheeting though they are designed to pull pallets horizontally on a smooth surface and not for vertical lifting applications. In support of this assertion, the petitioner included documentation of a pallet pulling device manufactured by Vestil Manufacturing Corporation indicating that the device is to be used only to pull pallets and not as an under-the-hook lifting device. Additionally, the petitioner believes that the gripping teeth of pallet pullers can damage plywood sheeting reducing their structural integrity. Incorporating the proposed prohibition on the use of pallet pullers, the petition contends, will reduce the potential hazard of employees being exposed to falling loads due to using devices beyond the parameters of their design or in the event that the device tears out from the plywood.



Pallet Puller Device

10.0 ANALYSIS

10.1 Proposed changes to Title 8 Section 1541.1(d) – Holes in sheeting

The petitioner is concerned that holes in plywood or similar sheeting materials weakens the material and endangers employees in excavations. However, plywood and other sheeting are not structural components of a shoring system and their strength is not a factor in preventing cave-ins. This is clarified in section 1541.1 Appendix D subsection (g)(7):

Please note that plywood is not intended as a structural member, but only for prevention of local raveling (sloughing of the trench face) between shores. Equivalent material may be used if it has been approved in accordance with Section 1505(a).

There is no need to amend section 1541.1(d) to address holes in plywood or other sheeting materials since these materials are not intended to protect employees from cave-ins.

Although not addressed by the petition, timber uprights are used as structural components in certain configurations of hydraulic shoring systems. Holes in timber uprights would weaken the members and possibly the ability of the shoring system to protect workers from cave-ins. However, the current regulation (subsection 1541.1(d)) already prohibits the use of materials and equipment for protective systems with damages or defects that make them unsuitable for safe use. Holes may constitute such damage.

If the competent person is unable ensure material or equipment is safe for use, a registered professional engineer must evaluate and approve the material or equipment. The petitioner's proposal to require a registered professional engineer to verify the bending strength of materials with holes is therefore duplicative of the existing requirement.

Additionally, subsection 1541.1(d)(2) requires manufactured materials and equipment to be maintained as recommended by the manufacturer and in a manner that will protect employees from hazards. Therefore, no changes are needed to subsection 1541.1(d) to protect employees from members weakened by holes.

10.2 Proposed section 1541.1(e)(1)(C) - Compliance of lifting devices with ASME B30.20

Requiring below-the-hook lifting devices to comply with ASME B30.20 may enhance worker safety, but the petitioner proposes that all types of shoring lifting devices comply with ASME B30.20, not just below-the-hook lifting devices. Because hooks and slings, which are also effective lifting devices, are not covered by ASME B30.20, requiring compliance with this standard would mean hooks and slings could no longer be used for lifting.

10.3 Proposed section 1541.1(e)(1)(D) - Damaged and unrated lifting ropes

The petitioner's proposal to prohibit undamaged and unrated ropes to lift components of excavation protective systems is not needed, as existing Title 8 regulations already prohibit such use. Rope used to lift excavation protective system components, such as plywood sheeting, is a sling and is within the scope of General Industry Safety Orders (GISO) Article 101 (sections 5040–5049).⁵ Subsection 5042(a) prohibits the use of knotted, damaged, defective, or kinked slings and prohibits slings be loaded in excess of their rated capacities. Subsection 5047(g) requires rope slings to have permanently affixed and legible identification markings as prescribed by the manufacturer that indicate the recommended safe working load for the type(s) of hitch(es) used, the angle upon which it is based, and type of fiber material.

10.4 Proposed section 1541.1(e)(1)(E) - Use of lifting chains without accessory devices

The petitioner is correct that lifting plywood sheets with a chain in a choker configuration may damage the plywood and creates a hazard of dropping and kicking-out of the plywood. However, the petitioner's proposed addition is not needed, as the hazards are addressed by existing regulations.

10.4.1 Damage to material

Damaged components of excavation protection systems are already covered by section 1541.1(d)(3) and discussed in part 10.1 of this evaluation. No additions are needed to address the concerns of the petitioner.

10.4.2 Kick-outs and falling loads

Subsections 5042(a)(6) and (9) require slings to be set to avoid slippage and require employees to be kept clear of loads to be lifted and of overhead loads. The use of slings in a choked configuration without any other accessory devices is a common rigging practice and can be accomplished safely if the requirements of section 5042 are followed.

10.5 Proposed section 1541.1(e)(1)(F) - Use of pallet pullers

The petitioner's proposal to prohibit the use of "Pallet Pullers" for lifting appears to refer to a particular commercial product and lacks a broader definition of "pallet puller" that would extend the scope of the proposal to cover an entire category of devices.

⁵ GISO Article 101 is referenced by Construction Safety Orders section 1593(n) for lifting with slings.

11.0 Conclusion

Cal/OSHA has reviewed the petition requesting the addition of new requirements for the installation and removal of excavation protective system within Title 8 subsections 1541.1(d)(1) and (e)(1). These new requirements would prohibit the use of damaged and unrated lifting equipment, altered sheeting, pallet pullers and chains when wrapped around plywood sheeting material, and would also prohibit any lifting devices that do not comply with the ASME B30.20 consensus standard.

Information provided by the petitioner was reviewed as to the purpose of the petition and how the new regulation would enhance worker safety. Manufacturer's specifications and operating instructions of the Plywood Pullers and similar lifting devices were also reviewed for their capability to be utilized for the installation and removal of excavation protective systems. Additionally, experts from the Cal/OSHA Crane Unit were contacted regarding the applicability and incorporation of related consensus standards in Title 8 regulations.

Although the proposed amendments of the petition appear to have the potential to enhance worker safety in the removal and installation of excavation protective systems, nearly all of the hazards discussed in the petition are already addressed by other regulations in Title 8. In addition, the proposal to require that lifting devices comply with ASME B30.20 would mean that hooks and slings could no longer be used for lifting, and the proposal to prohibit the use of Pallet Pushers for lifting is unclear because of the lack of a definition of "pallet pusher" as an entire category of devices rather than one commercial product. For the reasons discussed in this memo, Cal/OSHA believes the petition should be denied.