STANDARDS PRESENTATION

TO

CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD

PROPOSED STATE STANDARD

TITLE 8, DIVISION 1, CHAPTER 4

General Industry Safety Orders

Article 12. Tree Work, Maintenance or Removal
Amend Article 12 to read as follows:

§3420. Scope and Definitions.
(a) Scope. This standard applies to work performed and equipment used in tree and ornamental palm maintenance and removal.
NOTE 1: Requirements for fall protection in date palm operations and for ladders attached to date palms are provided in the General Industry Safety Orders, Sections 3458 and 3458.1.
NOTE 2: For ~~Line~~ line clearance tree trimming operations in proximity to high voltage energized conductors, refer to ~~shall be performed in accordance with~~ the provisions of Article 38 of the High-Voltage Electrical Safety Orders, Title 8, California Code of Regulations.~~.~~
(b) Definitions.
Apex. The point at which two saw cuts meet to form a notch.
Back Cut. The cut made in the tree limb or trunk on the side opposite the intended direction of fall. [From Z133.1-2006]
Brush Chipper. Equipment used to reduce tree debris to wood chips. [Ed note: TCIA comment]
Bucking. The process of cutting the downed tree into appropriate lengths.
Climbing Hitch. A hitch used for securing a tree climber to the climbing line, permitting controlled ascent, descent, and work positioning. [Ed note: ANSI Z133.1 definition]
Climbing Lines (Climbing Ropes). Rope that is designed by the manufacturer to support the climber while aloft in a tree.
Climbing Spurs. Sharp devices strapped to a climber's lower legs to assist in climbing trees. [Ed note: TCIA comment]
Come-along. A portable, hand-operated winching device, using cable or ropes to draw two objects closer together. [Ed note: TCIA comment]
Crotch. Branch union; the angle formed by two branches in the tree.
Double-crotching. A climbing method that uses the rope's opposite end or a second rope to enhance stability.
Drop Zone. The area beneath employees aloft who are involved in tree work operations and/or the area where the potential exists for struck-by injuries from objects dropped or lowered from above.
Felling. Cutting down an entire tree or standing section of a tree in one piece, from the ground, by incorporation of a notch and back cut.
Frond. A large compound leaf of a palm.

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False Crotch. A system, other than a natural crotch, used to support a climbing line. [Ed note: Z133.1-2006 definition]
Hinge. A strip of uncut wood fibers created between the face cut or notch and the back cut that helps control direction in tree felling or limb removal.
Leader. The stem or trunk of a tree usually growing in the upright position. [Ed note: TCIA comment]
Lightning Protection System. Hardware installed in a tree intended to reduce the risk of damage from a lightning strike.
Limbing. The removal of branches from either standing or downed trees.
Notch. A wedge cut into the tree or tree section, facing the intended direction of fall to control the felling direction.
(A) Conventional Notch. A directional felling cut into the side of a tree, facing the intended direction of fall and consisting of a horizontal face cut and an angle cut above it, creating a notch of approximately 45 degrees.
(B) Humboldt Notch. A directional felling cut into the side of a tree, facing the intended direction of fall and consisting of a horizontal face cut and an angled cut below it, creating a notch of approximately 45 degrees. A Humboldt notch is usually reserved for larger trees on steep slopes.
(C) Open-faced Notch. A directional felling cut into the side of the tree, facing the intended direction of fall and consisting of two cuts creating a notch greater than 70 degrees.
Ornamental Palm. A palm that is primarily for landscaping or scenery and not grown for the production and harvesting of fruits, such as dates for personal use or sale.
Palm Frond Skirt. One or more year's accumulation of dead and drooping palm fronds at the bottom of the palm's canopy and along its trunk. [Ed note: TCIA comment]
Prusik Loop. An endless loop of rope used to fashion the Prusik knot. The endless loop may be spliced or knotted with, at minimum, a double fisherman's knot.
Qualified Tree Worker. An employee who, through related training and on-the-job experience, has demonstrated familiarity with the techniques and hazards of tree maintenance, removal, and the equipment used in the specific operations involved.
Root Collar. A flared area at the tree trunk base where the roots and trunk come together. [Ed note: TCIA comment]
Rope(s). Includes climbing lines and climbing ropes unless otherwise stated, and includes all other ropes and lines used in tree work, maintenance and removal operations.
Secured (person). A tree worker that is safeguarded from unintended movement by utilizing a climbing system attached to the tree worker and connected to a tree or other stable support.

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Split Tail. A short section of climbing line with one end connected by a self-closing, self-locking carabiner or snap hook to the suspension D-rings of the tree saddle and the opposite end connected to the climbing line by a climbing hitch.
Step Potential. The voltage difference between the feet of a person standing near an energized grounded object. It is equal to the difference in voltage, given by the voltage distribution curve, between two points at different distances from the electrode.
Structural Support System. Consists of cabling between branches, installation of rods or bracing or other hardware used to keep the tree or its limbs structurally solid.
Tied In. When a tree worker's climbing line has been run through a natural or false crotch attached to the tree worker's saddle and completed with a climbing hitch or mechanical device, permitting controlled movement and work positioning.
Tree Climbing System. A collection of equipment used together for work positioning in a tree and generally consisting of a tree worker's saddle, one or more climbing lines, one or more work positioning lanyards and associated hardware.
Tree Worker's Saddle. An arrangement of straps, fittings, and buckles or other elements in the form of a waist belt with a low attachment element or elements and connecting support encircling the legs, suitably arranged to support the body in a sitting position.
Work-positioning Lanyard. For purposes of Article 12, a component of a tree climbing system consisting of a short section of approved rope, strap or line that has a rope snap or carabiner at either end, and that is used as a point of attachment to the tree or ornamental palm for securing the worker in the tree while aloft.
NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

§ 3421. General.
(a) An ~~accident prevention program~~ Injury and Illness Prevention Program shall be ~~inaugurated~~ implemented and maintained in accordance with Section 3203 of these Orders.
(b) Each work location where tree trimming, tree repairing or removal is to be done, shall be under the direction of a qualified tree worker.
(c) Employees shall be trained and instructed in areas that include, but are not limited to the following:
(1) ~~in the~~ The hazards involved in their job assignments.~~,~~
(2) ~~including the~~ The proper and safe use of all equipment, ~~utilized in tree work, maintenance or removal operations.~~ including, but not limited to, safety equipment and personal protective equipment.
(3) The identification of, and preventive measures relating to, common poisonous plants and harmful animals. [moved with edits from 3421(f)]

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(4) Operations that include pesticide and fertilizer applications for employers whose employees are exposed to, or engage in, such operations.
(5) The recognition and avoidance of electrical hazards applicable to employee job assignments including the instructions and training outlined in Section 3423 for tree work performed in proximity to energized power lines and conductors.
(d) ~~Such training~~ Training shall be documented by the employer to certify that the employee has satisfactorily completed the training program prior to performing the job assignment without the oversight and observation of a qualified person.
(e) The employer shall provide refresher or additional training on provisions of this standard for any employee who has:
(1) Been observed to violate the requirements of this Article;
(2) Been involved in an accident or near miss incident; or
(3) Receives a new job assignment that includes the use of equipment, machinery, tools or safety-related work practices that the employee is unfamiliar with.
(f) ~~(d)~~ A job briefing shall be conducted by a qualified tree worker before each work assignment is begun. Such job briefing shall include the description of the hazards unique to ~~a specific job~~ the work assignment, the appropriate work procedures to be followed, ~~work assignment~~ the appropriate personal protective equipment needed, and any other items necessary to ensure that the work can be accomplished safely. Additional job briefings shall be held if significant changes which might affect the safety of the employees occur during the course of the work.
(g) All equipment shall be operated by qualified persons, and where required, qualified tree workers. [moved with edits from 3428(a)(1)]
(h) ~~(e)~~ Prior to use, all equipment and safety devices shall be inspected by a qualified tree worker and any found to be defective shall be immediately repaired or removed from service.
~~(f) Employees shall be trained in the identification and preventive measures relating to common poisonous plants and harmful animals.~~ [moved to 3421(c)(3)]
(i) ~~(g)~~ An adequate supply of potable water shall be provided in accordance with the requirements of Section 3363 of these Orders.
(j) ~~(h)~~ Where vehicular or pedestrian traffic may endanger employees, traffic control shall be provided that conforms to the requirements of ~~the applicable provisions of Article 11~~ Sections 1598 and 1599 of the Construction Safety Orders~~, Title 8, California Code of Regulations~~.
(k) ~~(i)~~ Internal combustion engine fuel tanks shall be refilled in accordance with Section 3319 of these Orders.
(*l*) ~~(j)~~ The employer shall establish rescue procedures and provide training in emergency response. Training in aerial rescue procedures shall be provided for employees whose job assignments may require them to perform aerial rescues. ~~first-aid, cardiopulmonary resuscitation (CPR) and aerial rescue. First-aid and CPR training shall be performed by a certified instructor.~~

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(m) The employer shall provide training in first aid and cardiopulmonary resuscitation (CPR). For field work involving two or more employees at a work location, at least two trained persons in first aid and CPR shall be available. All new employees shall be trained in first aid and CPR within 90 days of their hiring dates. First aid and CPR training shall be performed by a certified instructor and shall be equivalent to that of the American Red Cross or the Mine Safety and Health Administration.
(n) ~~(k)~~ When employees are required to work in areas in which the noise levels exceed the allowable standards for occupational noise, the employer shall provide hearing protection and training as required in Article 105 of these ~~General Industry Safety~~ Orders.
NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

§3422. ~~Tree Workers' Saddles.~~ Ropes and Tree Worker Climbing Equipment.
(a) Tree workers' saddles shall be approved for their intended use as defined in Section 3206 of these orders. All load bearing components of a climbing system shall have a minimum tensile strength of 5,000 pounds.
EXCEPTION: Equipment such as a mechanical ascending device, provided that it is used with a secondary device that meets the minimum tensile strength requirements of this subsection.
(b) Tree worker saddles, work positioning lanyards and climbing lines shall be designed by the manufacturer as suitable for tree climbing. This climbing equipment shall not be altered in a manner that would compromise the integrity of the equipment.
(c) Climbing lines shall be designed by the manufacturer to support the climber while aloft in a tree. Climbing lines shall be constructed of a synthetic fiber with a minimum rated tensile strength of 5,000 pounds (22.24 kilonewtons [kN]) and shall have a minimum diameter of 7/16 inch (11 mm). Maximum working elongation shall not exceed seven percent at a load of 500 pounds (2.22 kN).
[Ed note: climbing line/rope design criteria is revised and moved from Section 3426(c)(1)]
(d) Prusik loops, split tails, and work-positioning lanyards used in a tree climbing system shall meet the minimum strength requirements for climbing lines. (Ed note: ANSI Z133.1-2006, Section 8.1.9)
(e) Equipment used to secure the tree worker in the tree or aerial lift shall not be used for anything other than its intended purpose.
EXCEPTION: The climbing line may be used to raise and lower tools. (Ed note: Z133.1-2006, 8.1.14)
(f) Climbing lines shall not be used to lower limbs or other parts of trees. [Ed note: moved from Section 3426(c)(3)]
(g) Climbing lines shall never be left in trees unattended. (Ed note: Z133.1-2006, 8.1.17)
(h) Rope ends shall be finished in a manner to prevent raveling. (Ed note: Z133.1-2006, 8.1.15)
(i) Rope and climbing equipment shall be stored and transported in a manner that prevents damage by contact with sharp tools and cutting edges, gas, oil and chemicals. (Ed note: Z133.1-2006, 8.1.16)

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(j) Ropes, climbing equipment, tackle blocks and pulleys shall be inspected for damage, cuts, abrasions and/or deterioration before each use. Defective equipment and components shall be removed from service immediately. (Ed note: Similar to Z133.1, 8.1.4)
(k) Climbing lines shall not be spliced to effect repair. [Ed note: 29 CFR 1910.269(r)(7)]
(*l*) Climbing spurs shall be of the tree-climbing type and shall have gaffs of the type and length suitable for the tree being climbed. [Ed note: moved from Section 3426(d)(1)]
NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

§3423. Electrical Hazards, General.
(a) Employees engaged in tree work operations such as, but not limited to, tree trimming, maintenance and removal in proximity to electrical equipment and conductors, shall be instructed ~~to~~ regarding the following:
(1) To consider all such equipment to be energized with potentially fatal voltages, never to be touched (contacted) either directly or indirectly.
(2) Electrical shock will occur when a person, by either direct contact or indirect contact with an energized electrical conductor, energized tree limb, tool, equipment, or other object, provides a path for the flow of electricity to a grounded object or to the ground itself. Simultaneous contact with two energized conductors phase to phase will also cause electric shock that may result in serious or fatal injury.
(3) Electrical shock may occur as a result of ground fault when a person stands near a grounded object: for example, if an uninsulated aerial device with its outriggers down comes into contact with a conductor.
(4) In the event of a downed energized electrical conductor or energized grounded object, there exists the hazard of step potential. [Ed Note: language in (a)(2) – (4) is similar to Z133.1-2006, 4.1.3]
~~Except as permitted in Section 3423(b), employees shall not be permitted to work closer than 6 feet to electrical equipment and conductors energized in excess of 600 volts.~~
~~(b) Work performed as described in Section 3423(a) shall be in accordance with Article 38 of the High-Voltage Electrical Safety Orders, Title 8 of the California Code of Regulations.~~
(b) A qualified tree worker shall be permitted to perform tree trimming activities within 10 feet, but no closer than 1 foot, of energized low voltage (600 volts or less) power lines and conductors, provided that the qualified tree worker is trained and competent in the following:
(1) The skills and techniques necessary to identify components of an electrical system, including the ability to distinguish exposed live parts from other parts of electric equipment;
(2) The skills and techniques necessary to determine the difference between low and high voltage energized conductors and equipment;
(3) The minimum approach distances that must be maintained as specified in this section corresponding to the voltages to which an employee will be exposed, and

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(4) The skills and work practices necessary to avoid contact with electrical lines and conductors, including the use of personal protective equipment and insulating or non-conductive tools.
(c) Employees shall not perform tree trimming activities within 10 feet of high voltage energized power lines and conductors unless the following requirements are met:
(1) Line clearance tree trimming operations as defined in Section 2700 of the High-Voltage Electrical Safety Orders (related to electrical equipment and conductors in excess of 600 volts) shall be conducted in accordance with Article 38 of the High-Voltage Electrical Safety Orders.
(2) Only qualified line clearance tree trimmers, or trainees, as defined in Section 2700 of the High-Voltage Electrical Safety Orders shall be permitted to perform such line clearance tree trimming work.
NOTE: Sections 2940.2 and 2951 of the High-Voltage Electrical Safety Orders provide minimum approach distances and requirements for line clearance operations.
(d) Metal core rope used in a climbing system shall not be used in proximity to energized electrical equipment and conductors.
NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

§3424. Mobile Equipment.
(a) General.
(1) All vehicles and mobile equipment shall be equipped, maintained and operated in accordance with the manufacturer's recommendations, ~~applicable~~ safety orders of the California Code of Regulations, Title 8, ~~California Administrative Code, and these orders.~~ including, but not limited to, the provisions contained in this Article 12 of the General Industry Safety Orders.
(2) Prior to the daily use of vehicles and mobile equipment, visual inspections and operational checks shall be made in accordance with the manufacturer’s instructions.
(3) No part of the employee’s body shall be used to locate or attempt to stop a hydraulic leak. [Ed note: moved with edits from Section 3428(a)(2)]
(4) Transportation of employees and materials shall be conducted in accordance with the provisions of Article 27 of these Orders.
(5) Vehicles shall not be operated at speeds which will endanger the driver or workers. [Ed note: moved from Section 3428(a)(7)]
(b) Aerial Devices.
(1) All aerial devices used for operations within the scope of this standard shall be in accordance with Article 24 of the General Industry Safety Orders ~~and~~ except as modified by ~~these orders.~~ the provisions contained in this Article 12 of the General Industry Safety Orders.
(2) Placement of an employee in a tree with the aid of an aerial device shall be accomplished in the following manner:

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(A) Prior to leaving the personnel basket or platform for entry into the tree, employees shall be ~~safety~~ secured to the tree in accordance with the requirements in Sections 3422 and 3427 before ~~removing~~ releasing the ~~safety line~~ personal fall protection system attached to the ~~basket~~ aerial device. The procedure shall be reversed when entering the personnel basket or platform from a tree.

(c) Brush Chippers.

(1) Each rotary drum tree or brush chipper or disk-type tree or brush chipper not equipped with a mechanical infeed system shall be equipped with an infeed hopper not less than 85 inches, measured from the blades or knives to ground level over the centerline of the hopper, and shall have sufficient height on its side members so as to prevent personnel from contacting the blades or knives of the machine during normal operations.

(2) Each rotary drum tree or brush chipper or disk-type tree or brush chipper not equipped with a mechanical infeed system shall have a flexible anti-kickback device installed in the infeed hopper for the purpose of protecting the operator and other persons in the machine area from the hazards of flying chips and debris.

(3) All brush chippers shall be equipped with a locking device on the ignition system to prevent unauthorized starting of the equipment.

(4) Trailer chippers detached from trucks shall be chocked or otherwise secured.

(5) Cutting bar and blades shall be kept sharp, properly adjusted and otherwise maintained in accordance with the manufacturer's recommendations.

(6) Each disk-type tree or brush chipper equipped with a mechanical infeed system shall have a quick stop and reversing device on the infeed. The activating lever for the quick stop and reversing device shall be located across the top, along each side of, and as close to the feed end of the infeed hopper as practicable and within easy reach of the operator.

(7) Rotary drum or disk-type brush chippers shall be fed from the side of the centerline, and the operator shall immediately turn away from the feed table when the brush is taken into the rotor. [Ed note: moved from Section 3428(a)(3)]

(8) Employees shall never place hands, arms, feet, legs, or any other part of the body on the feed table when the brush chipper is in operation or the rotor is turning. [Ed note: moved from Section 3428(a)(4)]

(9) Climbing equipment, ropes, body belts, harnesses and lanyards shall not be worn while operating chippers. [Ed note: similar to Z133.1-2006, 8.6.3]

(10) The brush chipper discharge chute or cutter housing cover shall not be opened or removed while any part of the chipper is turning or moving. [Ed note: moved with edits from Section 3428(a)(5]

(11) Material such as stones, nails, and similar debris shall not be fed into the brush chipper. [Ed note: moved from Section 3428(a)(6) with edits]

(12) Chipper mounted winches shall be used in accordance with the manufacturer’s instructions.

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

§3425. Portable Power Hand Tools.
(a) ~~Gasoline Engine~~ Power Saws.
(1) Power saws shall be operated and maintained in accordance with the manufacturer's instructions.
~~(1)~~ (2) Power saws weighing more than ~~twenty~~ fifteen pounds (service weight) that are used in trees shall be supported by a separate line or tool lanyard, except when working from an aerial-lift device or during topping or removing operations where no supporting limb is available. [Ed note: Similar to Z133.1-2000, 7.2.2 and Z133.1-2006, 6.3.3]
~~(2)~~ (3) All power saws shall be equipped with a constant pressure control that will return the saw to idling speed when released.
~~(3)~~ (4) Power saws shall be so adjusted that the chain drive will not engage at idling speed.
(5) Power saw engines shall be stopped when the saw is carried for a distance greater than 100 feet or when there are hazardous conditions, such as slippery surfaces or heavy underbrush. Chain brakes shall be engaged or the saw engine stopped when the saw is carried a distance greater than 10 feet. [moved with edits from Section 3428(a)(8)]
(6) The saw shall be stopped for all cleaning, refueling, adjustments, and repairs to the saw or engine where practicable, except where manufacturers' instructions require otherwise. [Ed note: moved from Section 3428(a)(9) with edits]
(7) Tree workers shall use a second point of attachment such as a work-positioning lanyard or double-crotched rope when operating a chain saw in a tree, unless the employer demonstrates that a greater hazard is posed by using a second point of attachment while operating chain saws in that particular situation. [Ed note: similar to Z133.1-2006, 6.3.8]
~~(b) Backpack Power Units (Pruning, Clearing, Etc.).~~
~~(1)~~ (8) While a ~~the~~ powered pole saw or brush saw ~~unit~~ is running, no one shall be permitted within 10 feet of the cutting head ~~of the brush saw~~, except the operator.
~~(2)~~ (9) ~~The power unit~~ Powered saws shall be equipped with a quick shutoff switch readily accessible to the operator.
NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

§3426. Hand Tools.
(a) General.
(1) Hand tools shall be used in accordance with Section 3556 of these Orders.
(2) When climbing into a tree, tree workers shall not carry hand tools and equipment in their hands unless they are tools used to assist them in their climbing. Tools other than ropes or

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throwlines shall not be thrown into a tree, out of a tree or between workers aloft. (See Z133.1-2006,7.1.4)
(3) Employees shall maintain a safe working distance from other employees when using hand tools. [Ed note: moved from Section 3428(a)(12)]
(4) Chopping tools shall be swung away from the feet, legs, and body. [Ed note: moved from Section 3428(a)(16)]
(5) Chopping tools shall not be driven as wedges or used to drive metal wedges unless specifically designed to be driven or to be used to drive wedges. [Ed note: moved with edits from Section 3428(a)(17)]
(6) Hand tools and equipment shall be properly stored or placed in plain sight out of the immediate work area when not in use. (Z133.1-2006, 7.1.6)
(b) Pruners and Saws.
(1) Pole pruners, pole saws, and other similar tools shall be equipped with non-conducting poles and actuating cords.
(2) Pole pruners and pole saws shall be hung securely in a vertical position to prevent dislodging. Pole pruners or pole saws shall not be hung on utility wires or cables, or left in the tree overnight. Pole saws shall be hung so that the sharp edge is away from the employee.
[Ed note: moved from Section 3428(a)(14)]
~~(c) Ropes.~~
~~(1) Climbing ropes shall be used when working aloft in trees. These ropes shall have a minimum diameter of 1/2-inch and shall be 3 or 4 strand, first-grade manila, with a nominal breaking strength of 2,300 pounds, or its equivalent in strength and durability.~~ [Ed note: 1st sentence covered by proposed 3427(a)(2) & (3) – 2nd sentence covered by proposed 3422(c)]
~~(2) Polypropylene or other synthetic ropes having similar low melting points shall not be used.~~ [Ed note: covered by 3422(b)]
~~(3) Climbing ropes shall not be used to lower limbs or other parts of trees.~~ [Ed note: moved to 3422(f)]
~~(d) Climber Spurs.~~
~~(1) Climber spurs shall be of the tree-climbing type and shall have gaffs of the type and length suitable for the tree being climbed.~~ [Ed note: moved to 3422(*l*)]
NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

§3427. Safe Work Procedures.
(a) Climbing and Access.
(1) Prior to climbing the tree, the employer shall ensure that the tree, including the root collar, is visually inspected by a qualified tree worker who shall determine and ensure a safe method of entry into the tree. The location of all electrical conductors and equipment within the work area

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shall be identified in relation to the work being performed. Climbing lines, ropes, lanyards, and other climbing equipment shall be inspected in accordance with the provisions of Section 3422(j) of this Article 12.

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Section 3427 continued:

(2) ~~The climbing line must be crotched as soon as practicable after the employee is aloft, and a taut line-hitch tied and checked.~~ When working aloft, employees shall wear a tree workers' saddle and have at least two means of being secured, such as a climbing line and a work positioning lanyard. (Ed note: Similar to Z133.1-2006, 8.1.18]

(3)(A) Employees shall be tied in or secured while ascending the tree and remain tied in or secured until the work is completed and they have returned to the ground. [Ed note: Similar to Z133.1-2006, 8.1.19]

(B) Employees shall not work from or leave a ladder to gain access to a tree unless the employee is tied in or otherwise secured to the tree. [Ed note: Similar intent to Z133.1-2006, 8.1.20]

EXCEPTION: Employees may work from a self-supporting ladder in accordance with the manufacturer's instructions.

~~(3)~~ (4) The ~~climbing rope~~ tie-in point shall be ~~passed~~ established on or around the main leader or a major upright branch of the tree as high as necessary using branches with a wide crotch to prevent any binding of the ~~safety rope~~ climbing line. The crotch selected for tying-in shall be over the work area as nearly as possible, but located in such a way that a slip or fall would not permit the employee to come in contact with any electrical conductor, equipment or other hazard. ~~The rope shall be passed around the main leader or an upright branch, using a limb as a stop. Feet, hands, and ropes should, where possible, be kept out of tight V-shaped crotches.~~

~~(4) When working aloft, employees shall be required to wear tree workers' saddles and tie-in with an approved safety strap or rope.~~ [Ed note: moved with edits to Section 3427(a)(2)]

~~(5) Employees shall remain tied in until the work is completed and they have returned to the ground, unless it is necessary to recrotch.~~ [Ed note: covered by Section 3427(a)(3)(A)]

(b) Pruning, ~~and~~ Trimming and Tree Removal Operations.

(1) ~~Employees shall be instructed to give an audible warning before a limb is dropped. "Timber," "headache" or "heads up" can be used for this purpose.~~

The employer shall establish a method of verbal or visual communication which shall be reviewed during the job briefing, prior to the start of pruning or removal operations. The verbal or visual communication system shall use an established command and response system or pre-arranged, two-way hand signals. The communication method shall be clearly understood and used during all rigging operations. The command "stand clear" from aloft and the response "all clear" from the ground are some terms that may be used for verbal communication.

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(2) A drop zone shall be established prior to the start of pruning or removal operations. Employees not directly involved in the pruning or removal operation shall stay out of the pre-established drop zone until it has been communicated by a qualified tree worker directly involved in the operation that it is safe to enter the drop zone. Employees shall be positioned and their duties organized so that the actions of one employee will not create a hazard for any other worker. (Ed note: similar to Z133.1-2006, 8.4.12)

(3) Only qualified tree workers directly involved in the operation shall be permitted in the drop zone when a load is being suspended by a rigging system.

(4) When a rigging system is necessary, a qualified tree worker shall determine the appropriate rigging system for the removal project based on factors that include, but are not limited to, the species, size, weight, and length of tree sections or limbs being removed.

(5) When it is necessary to remove branches or sections of a tree, a qualified tree worker who is trained and experienced in rigging operations shall determine whether the tree can withstand the strain of the lowering procedures. If the determination is that the tree cannot do so, other means of removing the tree shall be considered. (Similar to Z133.1-2006, 8.5.5)

(6) Wedges, block and tackle, rope, and other lowering devices shall be used when there is a danger that a tree or trees being removed may fall in the wrong direction or damage property. All limbs and sections shall be removed to a height and width sufficient to allow the tree to fall clear of any wires or other objects in the vicinity. (Z133.1-2006, 8.5.9)

~~(2)~~ (7) ~~A separate line~~ Separate ropes for lowering limbs shall be attached to limbs which cannot be dropped or are too heavy to be controlled by hand. ~~The use of the same crotch for both safety rope and work rope shall be avoided.~~ Climbing lines shall not be attached to the same crotch as ropes used for lowering limbs.

~~(3)~~ (8) Cut branches (hangers) shall be removed from the tree prior to leaving the job site.

~~(4)~~ (9) ~~With the exception of minor tree trimming, at~~ When an employee is elevated above 12 feet in any tree work operations including climbing ladders, climbing into the tree or using an aerial device, ~~involving tree maintenance or removal,~~ a second employee shall be ~~used at each work location~~ present to render immediate assistance.

[Ed note: subsection (b)(6) is similar in its intent to Z133.1-2006, 8.1.2]

(10) Palm frond skirts shall be removed from the top down. Qualified tree workers performing this work shall be supported by a climbing line and a false crotch attached above the frond skirt, or they shall work from an aerial device.

EXCEPTION: Fronds may be trimmed from below the dead frond accumulation only when a qualified tree worker who is competent and experienced in palm tree work and the hazards associated with removing dead fronds makes a determination that this task can be safely performed from below.

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NOTE: Because palm frond skirts have the potential of unexpectedly releasing onto a worker below, the ANSI Z133.1-2006 standard "Arboricultural Operations-Safety Requirements" Section 8.2.7 states that tree workers shall never attempt to remove palm frond skirts of three years or more growth by positioning themselves below the work areas while being supported by a lanyard.

(11) When dry conditions exist, no employee shall smoke in or near dead palm fronds. All chain saws used under such conditions shall have mufflers and spark arresters in good working condition. (Similar to Z133.1-2006, 8.2.6)

(c) Felling.

(1) The work area shall be cleared to permit safe working conditions~~, and an escape route shall be planned~~ before any cutting is started.

(2) A planned escape route for all workers shall be prepared before cutting any standing tree or trunk.

(3) ~~(2)~~ A notch and back cut shall be used to establish a hinge when ~~in~~ felling trees over ~~10~~ 5 inches in diameter.

(A) Notches and back cuts shall be made at a height that enables the chain-saw operator to safely begin the cut, control the tree or trunk, and have freedom of movement for escape.

(B) The notch cut used shall be a conventional notch, an open-faced notch, or a Humboldt notch as defined in Section 3420(b).

(C) The notch depth shall not exceed one-third of the diameter of the tree.

(D) The back cut shall not penetrate into the predetermined hinge area.

(E) With a conventional notch or Humboldt notch, the back cut shall be 1 to 2 inches above the apex of the notch to provide an adequate platform to prevent kick-back of the tree or trunk. With an open-face notch (greater than 70 degrees), the back cut shall be at the same level as the apex of the notch.

(F) The two saw cuts that form a notch shall not cross at the point where they meet.

(4) ~~(3)~~ Just before the tree or trunk is ready to fall, an audible warning shall be given to those in the area. All non-involved personnel in the vicinity shall be safely out of range before the tree falls.

(5) Prior to the start of any tree felling or removal operations, the hazards and relevant factors pertaining to the tree and the site are to be considered by undertaking actions that include, but are not limited to, the following:

(A) Identifying potential hazards in the area surrounding the tree to be removed, including nearby trees.

(B) Determining the species and shape of the tree.

(C) Evaluating the lean of the tree.

(D) Inspecting for loose limbs and wood chunks, or other overhead material.

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(E) Evaluating the wind force and direction.
(F) Identifying decayed or weak spots in the tree.
(G) Providing a means to protect other persons, property, and electrical conductors.
(H) Evaluating the terrain characteristics and/or limitations of the work area; and
(I) Identifying evidence of bees or other wildlife habitation in the tree that may present hazards.
(d) Bucking.
(1) The employee shall work from the uphill side whenever possible during limbing or bucking operations. [Ed note: moved from 3428(a)(18]
(2) The employee shall block the log during bucking operations to prevent rolling, when necessary. [Ed note: moved with edits from 3428(a)(19]
(3) When bucking trunks of trees, wedges shall be used when necessary to prevent binding the chain saw guide bar or chain. [Ed note: moved from 3428(a)(20) with edits.]
(e) Structural Support Systems, and Lightning Protection Systems.
(1) Employees on the ground shall not stand in the drop zone during the installation of structural support systems or lightning protection systems.
(2) Tools used to install structural support systems or lightning protection systems shall be carried in a bag or on a belt designed to hold such tools or attached to a tool lanyard.
(3) Employees installing cabling, support systems or lightning protection systems shall be positioned off to one side in order to avoid injury in case of a cable system failure that could occur when a block and tackle or hand winch is released.
(4) When removing a cable from a tree, a block and tackle or come-along system shall be used before removing the cable.
(5) When installing a replacement cable, the replacement cable shall be fully installed before removing the outdated cable.
NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

~~§3428. Operating Rules.~~ Repealed [Ed note: Provisions of this section are in large part relocated as outlined below]
~~(a) Every employer engaged in tree work shall have and employees shall be instructed in a set of operating rules, including but not limited to, the appropriate rules below:~~
~~(1) All equipment shall be operated by qualified personnel.~~ [Ed note: moved to 3421(g)]
~~(2) No part of the body shall be used to locate or attempt to stop a hydraulic leak.~~ [Ed note: moved to 3424(a)(3)]
~~(3) Rotary drum or disk-type brush chippers shall be fed from the side of the center line, and the operator shall immediately turn away from the feed table when the brush is taken into the rotor.~~ [Ed note: moved to 3424(c)(7)]

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~~(4) Employees shall never place hands, arms, feet, legs, or any other part of the body on the feed table when the brush chipper is in operation or the rotor is turning.~~ [Ed note: moved to 3424(c)(8)]
~~(5) The brush chipper chute shall not be raised while rotor is turning.~~ [Ed note: moved to 3424(c)(9)]
~~(6) Material such as stones, nails, sweepings, etc., shall not be fed into the brush chipper.~~
[Ed note: moved to 3424(c)(10)]
~~(7) Vehicles shall not be operated at speeds which will endanger the diver or workers.~~ [Ed note: moved to 3424(a)(5)]
~~(8) Power saw engines shall be stopped when carrying for a distance greater than 100 feet, or in hazardous conditions such as slippery surfaces or heavy underbrush. Saw shall be at idle speed when carried short distances.~~ [Ed note: moved to 3425(a)(5)]
~~(9) The engine shall be stopped for all cleaning, refueling, adjustments, and repairs to the saw or engine where practical, except where manufacturer's procedures require otherwise.~~ [Ed note: moved to 3425(a)(6)]
~~(10) When using back power units for pruning or clearing, the operator shall heed the position of all personnel while the unit is running.~~ [Ed note: deleted]
~~(11) Tree workers shall not carry tools in their hands while climbing.~~ [Ed note: deleted, covered by proposed 3426(a)(2)]
~~(12) Employees shall maintain a safe working distance from other employees when using hand tools.~~ [Ed note: moved to 3426(a)(3)]
~~(13) Employees shall not throw or drop tools from trees unless warning has been given and the ground area is clear, and the act of dropping will not endanger personnel.~~ [Ed note: deleted and covered by new 3426(a)(2)]
~~(14) Pole pruners and pole saws shall be hung securely in a vertical position to prevent dislodging. Pole pruners or pole saws shall not be hung on utility wires or cables, or left in the tree overnight. Pole saws shall be hung so that the sharp edge is away from the employee.~~
[Ed note: moved to 3426(b)(2)]
~~(15) Climbers shall inspect the ropes for cuts or abrasions before starting work. If any cuts or serious abrasions are found, the rope shall be immediately repaired or removed from service.~~
[Ed note: covered by proposed Section 3422(j)]
~~(16) Chopping tools shall be swung away from the feet, legs, and body.~~ [Ed note: moved to 3426(a)(4)]
~~(17) Chopping tools shall not be driven as wedges or used to drive metal wedges.~~ [Ed note: moved with edits to 3426(a)(5)]
~~(18) The employee shall work from the uphill side whenever possible when doing limbing or bucking.~~ [Ed note: moved to 3427(d)(1)]
~~(19) The employee shall block the log to prevent rolling, when necessary.~~ [Ed note: moved to 3427(d)(2)]
~~(20) When bucking up trunks of trees, wedges shall be used so that the tree will not bind the guide bar or chain.~~ [Ed note: moved with edits to 3427(d)(3)]

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

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Group 2. High-Voltage Electrical Safety Orders
Article 38. Line Clearance Tree Trimming Operations

Amend Section 2950 to read as follows:
§2950. Application.
(a) This article shall apply to all line clearance tree trimming operations performed in the vicinity of exposed energized overhead conductors and equipment where any part of the employee's body, tools or equipment being used, or parts of trees being worked upon, is likely to come within the distances specified in ~~Section 2946(b)(2)~~ Table 1 of this section.
(b) Minimum approach distances to energized conductors for persons other than qualified line clearance tree trimmers and trainees shall be maintained in accordance with Table 1.
EXCEPTION: A qualified tree worker as defined in the General Industry Safety Orders (GISO), Section 3420(b) may perform tree trimming activities within 10 feet, but no closer than 1 foot, of energized low voltage (600 volts or less) power lines and conductors, provided the provisions in GISO Section 3423 related to such work are met.

Table 1.
Minimum approach distances to energized conductors for persons other than qualified line-clearance tree trimmers and trainees

Nominal voltage in kilovolts (kV) phase to phase*	Distance	
	ft-in	Meters
0.0 to 1.0	10-00	3.05
1.1 to 15.0	10-00	3.05
15.1 to 36.0	10-00	3.05
36.1 to 50.0	10-00	3.05
50.1 to 72.5	10-09	3.28
72.6 to 121.0	12-04	3.76
138.0 to 145.0	13-02	4
161.0 to 169.0	14-00	4.24

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230.0 to 242.0	16-05	4.97
345.0 to 362.0	20-05	6.17
500.0 to 550.0	26-08	8.05
785.0 to 800.0	35-00	10.55

*Exceeds phase to ground minimum approach distances per the federal standard, 29 CFR 1910.333.

NOTE 1: Minimum approach distances to energized conductors for qualified line clearance tree trimmers and trainees as defined in Section 2700 are provided in the provisions and references of Section 2951 of these Orders.
NOTE 2: Additional requirements for Tree Work, Maintenance or Removal, are contained in Article 12 of the General Industry Safety Orders, Title 8, California ~~Administrative~~ Code of Regulations.
NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.