



INCIDENT COMMAND SYSTEM

Arbor Technical Rescue
Operational System Description
ICS 162-5

April 2026

This document contains information relative to the Multi-Agency Coordination System (MACS) and the Incident Command System (ICS), developed by FIRESCOPE and adopted as the framework of the National Incident Management System (NIMS). ICS products are designed to be compatible with and compliant with NIMS, as directed by the National Response Framework and adopted by the FIRESCOPE Board of Directors.

Additional information and documentation can be obtained from the following source:

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INTRODUCTION

This operational guide was developed to provide a clear description of the roles, duties, and equipment pertinent to an Arbor Rescue incident.

Rescuers face numerous hazards, including but not limited to falls, extreme heights, high voltage, obstructions, improper rigging and hoisting practices, and hazards associated with structural failures of trees. Extreme height also means victims and rescuers can be exposed to environmental factors such as wind gusts and extreme temperature fluctuations.

FIRESCOPE, which has broad representation from the California Fire Service, created this manual.

While this operational guide cites minimum staffing levels for Arbor Rescue, it is not intended to preclude the need to augment staffing based on the complexity of the rescue or the needs of the authority having jurisdiction (AHJ).

This document contains information relative to the Incident Command System (ICS) component of the National Incident Management System (NIMS). This is the same Incident Command System developed by FIRESCOPE.

Checklist/Size-Up/Hazard Assessment

1. Size-Up

- Location / status of the victim(s) / incident
 - Location of tree
 - Determine potential for access.
 - Will affect which access method will be used.
 - Height from the ground
 - Injury / potential exposure to rescuers
 - Suspension trauma
 - Fall arrest
 - Exposure to weather conditions
 - Broken / hanging limbs
 - Palm skirt
 - Animal encounters
 - Tree in contact with power lines / Proximity to power lines
 - Tools and equipment
 - Victim Profile Consideration
 - Behavioral emergency
 - Training level/experience of climber
 - Additional resources

- Rescue air cushion
 - counselor/crisis negotiator
 - Victim on fall arrest/harness
 - Activity/work being performed in the tree
 - Recreational climbing
 - Arborist activities
 - Limbing
 - Skirt removal
 - Topping
- Scope and magnitude of the incident
 - Risk analysis
 - Survivability profile
 - Rescue vs Recovery
- Hazards
 - Type of hazard present
 - Isolation and control of hazards
 - Inhalation (animal/rodent excrement)
 - Competent person on-site / Agency Representative
 - Contingency plan for fire suppression
- Access
 - Aerial apparatus/man lift
 - Crane/hoist
 - Ground ladder
 - Arborist belt
 - Line gun/pilot line launcher
 - Unmanned Aircraft System (UAS)
- Assessment of staffing/equipment needs
 - Team-based or rescuer-based rescue
 - Ground up
 - Top down
- Special resource needs
 - Utility company
 - Competent person on-site / Agency Representative
 - Contract resources (crane / elevated platform)

2. Hazard Assessment

- Fall factor
- Weather (current and forecasted)
- Isolating and controlling hazards
 - Broken/hanging limbs
 - Tree skirt / size / stability of fronds
 - Contacted/downed electrical lines / Proximity to power lines
- Resources needed to control hazards
 - Competent Person on-site / Agency Representative

- Utility company
- Contract crane/platform services
- Arborist
- PPE
- Integrity and stability of the environment involved
 - Type of tree
 - Age of tree
 - Activity being performed in the tree prior to rescue

3. Checklist

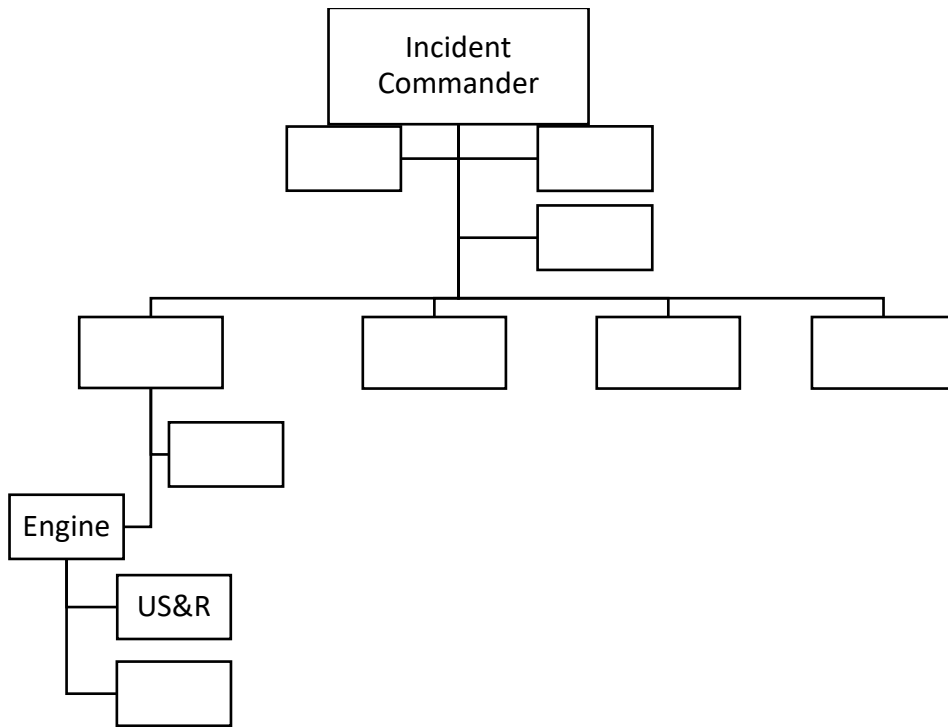
- Appropriate PPE
 - Rope rescue attire per AHJ
 - Respirator protection (example: P100, half-mask)
- Appropriate equipment/resources
- Appropriate training
- Pre-rescue briefing

- Survivability profile
 - Risk analysis
- Identification and understanding of hazards by all rescuers
 - Isolating and controlling hazards
 - Competent person on-site / Agency Representative
 - Current and forecasted weather conditions
- Agency Representative contacted
- Alternate options for victim access
- Rescuer's self-rescue plan
- EMS/ambulance on standby

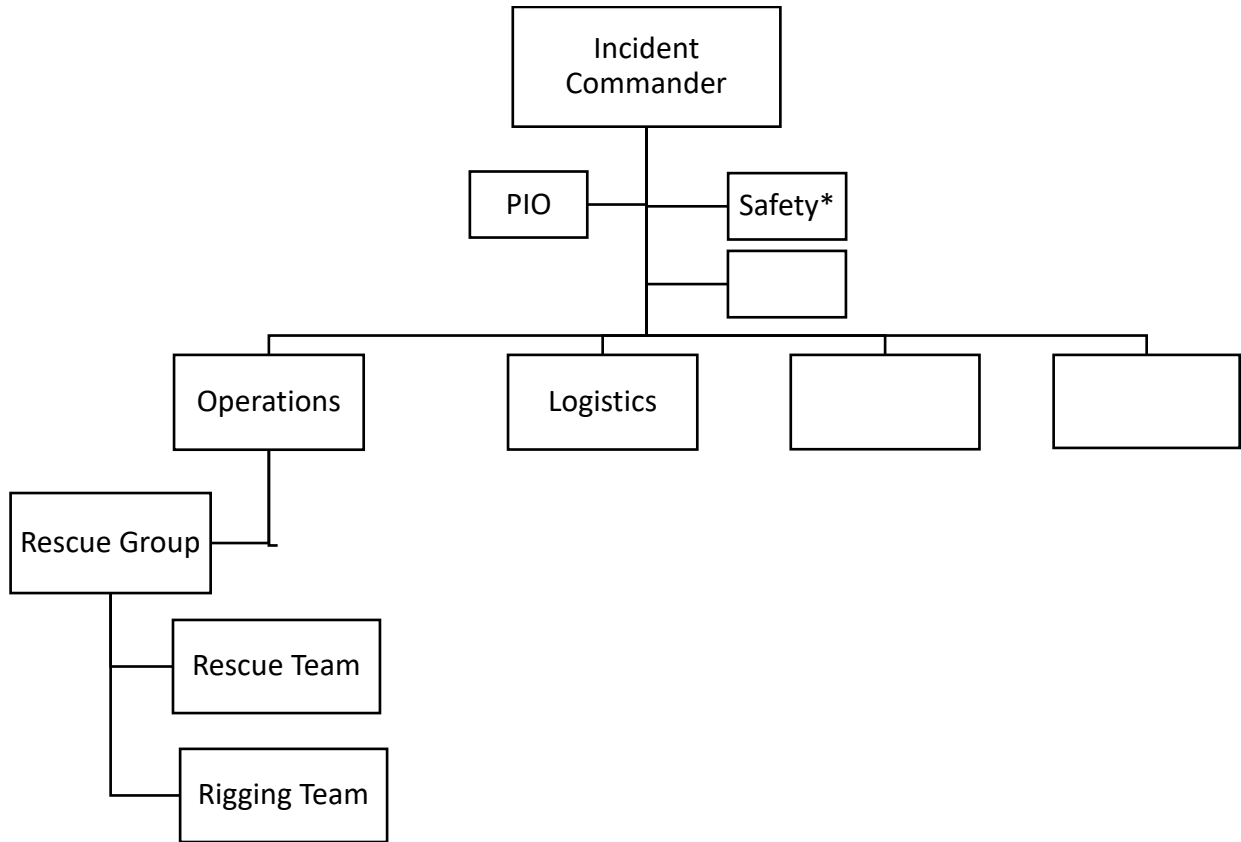
ORGANIZATION

The organizational structure of an Arbor Rescue incident is similar to that in other incidents.

Initial Response

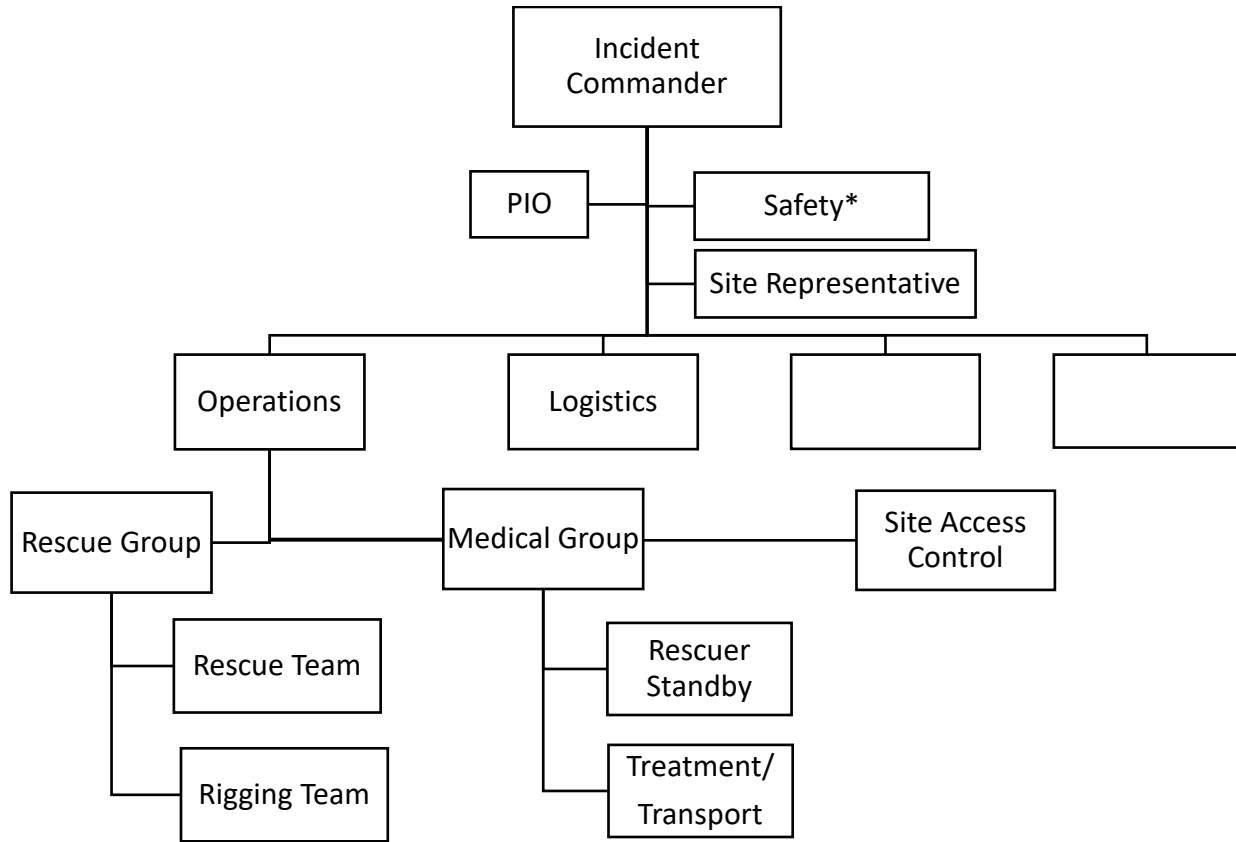


Reinforced Response



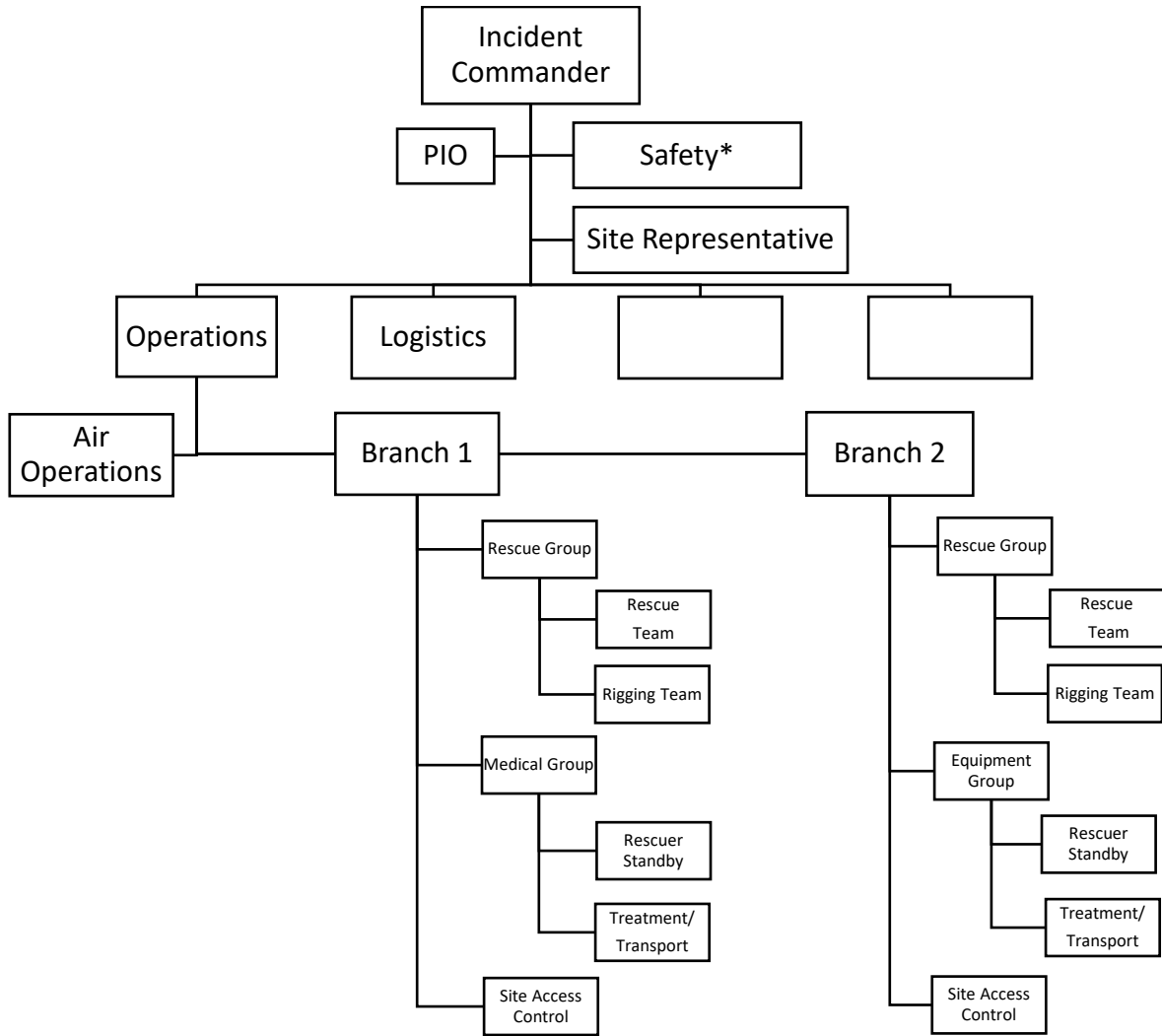
*When possible, the Safety should be US&R Qualified.

Multi-Division/Group Response



*When possible, the Safety should be US&R Qualified.

Multi-Branch Response



*When possible, the Safety should be US&R Qualified.

1. Awareness Level Arbor Rescuer will perform the following skills:

- NFPA 2500 (1006) Rope Rescue Awareness Level requisite knowledge
 - Identify the need for additional resources needed for arbor rescue
 - Participate in pre-rescue surveys
 - Isolate/ manage exposure to hazards
 - Assess the integrity of the tree
 - Recognize, identify, and use fall protection and work positioning devices in conjunction with aerial devices, manlifts, and ground ladders

2. Operations Level Arbor Rescuer will perform the following skills:

- NFPA 2500 (1006) Rope Rescue Operational Level requisite knowledge
 - Participate in pre-rescue surveys
 - Isolate/ manage exposure to hazards
 - Assess the integrity of tree
 - Recognize, identify, and use fall protection and work positioning devices in conjunction with aerial devices, manlifts, and ground ladders

3. Technician Level Arbor Rescuer will perform the following skills:

- NFPA 2500 (1006) Rope Rescue Technician Level requisite knowledge
 - Direct arbor rescue team
 - Develop an IAP for a single arbor-based rescue
 - Ascend a tree to conduct a rescue using technical rope systems and/or boot spikes/gaffs and flip lines/straps
 - Perform a rescue requiring the release of an entrapped victim
 - Ground-based
 - Tree-based
 - Multi-Pitch Rescue
 - Use of chainsaw in an elevated position

MINIMUM STAFFING

Arbor Rescue:	Operations Level 4 person	Technician Level 6 person
Ground Based	<ul style="list-style-type: none"> ● Rescuer 2 (Ground ladder, Aerial Ladder, Manlift) ● Operator 1 (Aerial device) ● Ground Support 2 ● Rescue Group Supervisor/Safety 	<ul style="list-style-type: none"> ● Climber 1 (rescuer) ● Rigger 1 (main line) ● Rigger 2 (belay line) ● Rescue Group Supervisor ● Tree Safety ● Ground safety
Tree Based	<ul style="list-style-type: none"> ● Not recommended for Operations level 	<ul style="list-style-type: none"> ● Climber 1 (rescuer/rappel) ● Climber 2 (arbor-based belay) ● Rescue Group Supervisor
Multi-Pitch	<ul style="list-style-type: none"> ● Not recommended for Operations level 	<ul style="list-style-type: none"> ● Climber 1 (rescuer) ● First pitch rigger (main line) ● First pitch rigger (belayer) ● Climber 2-second pitch rescuer ● Second pitch rescuer (main line) ● Second pitch rescuer (belayer line) ● Recommend to use two Technician level teams in multi-pitch rescues

MINIMUM EQUIPMENT LIST

***** All equipment must meet rescue standards from 3rd party testing (NFPA, EU, CE, ANSI, UIAA)*****

Required Equipment

QTY	DESCRIPTION
1000	Feet of rescue rope (NFPA "G" or "T") (rope lengths must be double the maximum height of anticipated tree plus 25%)
1	Ladders- One Type 1 Engine complement
1	Tree access device at least one of the two following options: 1. Pilot line launcher 2. Boot spikes/gaffs with flip line/straps
1	Cutting device for Arborist's flip line/strap at least one of the following options: 1. Angle grinder with multi-purpose wheel 2. Bolt cutter (battery power preferred) 3. Other cutting device capable of cutting steel flip strap
3	Descent Control Devices
40	Carabiners
4	Cable/wire anchors with covers
4	Prusik minding pulley
4	Prusik double pulley
6	Short Prusiks

QTY	DESCRIPTION
6	Long Prusiks
8	20 Foot Webbing
8	15 Foot Webbing
8	12 Foot Webbing
8	5 Foot Webbing
2	Mobile Rope Grab (ASAP or equivalent)
6	Edge Protection (AHJ determined)
4 or 6	Class III Harness (for each member)
2	Etrier or equivalent foot loops
4	Ascenders (preferably handheld)
1	SKED or Litter basket with pre-rig
2	Rope Rescue Gear Bags
12	Pickets or picket system
1	Victim Pick-off harness
1	Victim Chest harness
4 or 6	Radio communication equipment (for each member)

QTY	DESCRIPTION
4	Personal Mechanical Advantage (Set of fours)
4 or 6	Head lamps (for each member)
1	NFPA 2500 (1983) Class III Victim Extrication Device or equivalent
2	Tethers 3-5 feet in length (to secure saw)
2	Wood chains (wildland style)

Optional Equipment

QTY	DESCRIPTION
2	Chainsaws (arborist style, preferably lightweight w/ top handle)
	(Anchor Straps or other anchor devices can take the place of half of the webbing)
	Mechanical winch or Capstan
	Ladder
	Glow sticks
	Swivels
	Hot stick or voltage detector

TREE TYPES

Source:

- **ANSI A300 Tree Care Standards** – Best practices for pruning, cabling, planting, and maintenance
- **ANSI Z133 Safety Requirements** – Safety protocols for arboricultural operations
- **OSHA Tree Care Industry Standards** – Federal workplace safety regulations for arborists
- **Tree Care Industry Safety Guidelines** – Practical hazard awareness and mitigation strategies

In general, there are 11 types of recognized North American trees that possess unique features and hazards.

- Oak
- Maple
- Pine
- Palm
- Eucalyptus
- Willow
- Ash
- Elm
- Cedar
- Sycamore
- Fruit Trees

Oak



Oak trees can grow large, are a strong hardwood, and have an extensive canopy. Oak trees may have heavy limbs prone to sudden drop and decay pockets. Oak trees require careful rigging and pose a risk of falling branches.

Maple



Maple trees are fast-growing and made of brittle wood. Limbs are susceptible to breakage under wind/snow load, due to structural weakness, and pruning must avoid over-thinning.

Pine



Pines are tall conifers made of resinous wood. Pitch exposure may be a skin/eye irritant. falling cones, climbing hazards, and resin affecting equipment all pose hazards.

Palm



Palms are tall trees with fibrous trunks and fronds. Falling fronds and frond skirts can be lethal. Palms often have hidden decay. ANSI A300 specifies palm-pruning standards.

Eucalyptus



Eucalyptus are a rapid growth tree containing aromatic oils. Brittle branches, fire hazard due to oils pose risk. Eucalyptus poses a high risk of limb failure, and PPE may be needed for oil exposure.

Willow



Willow trees are made of flexible wood. They thrive near water and have weak branch unions. Decay is common and requires frequent inspection, and they are prone to a high failure rate.

Ash



Ash trees are medium-hardwood trees. They are prone to emerald ash borer infestation, causing brittle wood. Removal is often necessary as they are considered a hazardous tree.

Elm



Elms have large canopies and are vase-shaped. Dutch elm disease is common and is associated with weak crotches. Elms pose rigging challenges and require disease management.

Cedar



Cedar is an aromatic softwood consisting of slippery bark. Resin exposure may require PPE for skin/respiratory protection.

Sycamore



Sycamores have large leaves and mottled bark. Heavy limbs may drop, and fungal infections are common. May requires aerial lift for safety and dust inhalation poses risk.

Fruit Trees



Fruit trees are generally smaller and are often orchard species. May contain thorns and pesticide residues. PPE for chemical exposure and ladder may be needed for safety.

COMPLEX RIGGING

- In some cases, when victims are beyond the reach of ground ladders, aerial devices, and/or manlift, complex ascending and rigging techniques will be necessary to access the victim. The use of pilot line launchers to establish high points from the ground may be necessary.
- The use of boot spikes/gaffs and flip lines/straps to ascend the tree from the ground
- Ascending a palm tree with over 5 years of growth by climbing is not recommended due to the size of the tree skirt and stability in fronds.

TRAINING AND EXPERIENCE REQUIREMENTS

- Rope Rescue Technician
- AHJ determined training regarding use of boot spikes/gaffs and flip lines/straps
- Use of chainsaw when suspended by a rope system & harness
 - Significant hazards of cutting the rope or hot saw becoming in contact with rope

RESOURCES

1. [California Code of Regulations, Title 8, Section 1670. Personal Fall Arrest Systems, Personal Fall Restraint Systems and Positioning Devices.](#)
2. [California Code of Regulations, Title 8, Section 3458. Fall Protection for Date Palm Operations.](#)
3. [California Code of Regulations, Title 8, Section 3458.1. Ladders Attached to Date Palms.](#)
4. [California Code of Regulations, Title 8, Section 3420. Scope and Definition.](#)
5. [California Code of Regulations, Title 8, Section 3427. Safe Work Procedures.](#)
6. [Tree Work Safety Guide](#)
7. [Tree Work Safety](#)
8. [Tree Work Safety - Cal/OSHA](#)
9. [Tree-worker-webinar-resource-guide.pdf](#)

DEFINITIONS

Apex- The point at which two saw cuts meet to form a notch.

Arborist Chainsaw - a compact, lightweight, and powerful chainsaw specifically designed for in-tree pruning, climbing, and maintenance.

Back Cut- The cut made in the tree limb or trunk on the side opposite the intended direction of fall.

Brush Chipper- Equipment used to reduce tree debris to wood chips.

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.

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.

Come-along- A portable, hand-operated winching device, using cable or ropes to draw two objects closer together.

Competent person- means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.”

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 Starting- The act of starting a power saw by simultaneously pushing the saw away from the body with one hand while pulling on the starter cord handle with the other.

Drop Zone- The area established by a qualified tree worker beneath employees aloft involved in tree work operations and/or 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.

Froned- A large compound leaf of a palm.

False Crotch- A system, other than a natural crotch, used to support a climbing line.

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.

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.

Proximity- An area within 10 feet (3.05 meters) of energized overhead electrical conductors rated 50 kilovolts (kV) phase to phase or less. For overhead electrical conductors rated more than 50 kV phase to phase, the distance is increased 4/10 inch (10 millimeters) for each additional kV.

Prusik Loop- An endless loop of rope used to fashion the Prusik knot (which is a sliding friction knot). The endless loop may be spliced or knotted with, at minimum, a double fisherman's knot.

Qualified Arbor 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.

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 by utilizing a climbing system attached to the tree worker and connected to a tree or other stable support.

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.

Survivability Profile- Is a systematic approach to evaluating the condition of the victim. This system should account for the environment and atmosphere surrounding the victim, mechanism in which the victim came to rest, all surrounding hazards, and the PPE or lack thereof being used to protect the victim. This process should be used to determine the likelihood of a successful rescue; the result should then be applied to the risk analysis to determine the mode of operation.

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.