SCE Compliance Tree Trimming

Critical Observable Actions (COAs)

Guidance (updated 8/31/23)

Contents

BASIC SITE SAFETY

General Requirements

- Crew actively uses a competent, engaged observer
    - From the HS Handbook for contractors: "…an engaged observer is present at any time a worker is performing duties in the air (working from an aerial device or climbing a tree). An engaged observer shall be solely focused on the worker in the air and must be free from other activities, duties, and distractions. The engaged observer shall be within visual and voice communication and must maintain visibility of the worker/equipment as well as the proximity to all hazards, especially energized conductors." Note: SCE does not require that each tree crew have an individual solely dedicated to safety. The engaged observer is required when a worker is performing duties in the air including active climbing, repositioning within the tree, cutting, tying rigging ropes, maneuvering the boom, etc. SCE tree contractors commonly pause aerial operations to allow the engaged observer to temporarily perform other tasks such as escorting pedestrians through a work area, participate in rigging operations (e.g., operate a tag line while maintaining visual contact with the worker aloft), tailboard with visitors to the worksite, etc. While the designated engaged observer is performing other tasks, workers aloft may NOT perform any activities that require an engaged observer. The worker aloft and the engaged observer shall clearly communicate STOP WORK and restart of work when the engaged observer resumes sole duties as an engaged observer.
    - A "competent" observer is knowledgeable of the activities being performed and associated hazards and maintains visual and auditory contact with workers performing these activities.
    - Required anytime a worker is aloft, backing a vehicle (if passenger is present), and when heavy equipment is in operation (Skidsteer, Sennebogen, Fallbach, crane).
- Crew has an EAP and necessary equipment onsite
    - EAP expectations are in the Contractor's HASP
    - "Necessary equipment onsite" includes at a minimum: emergency climbing/rescue gear (including additional gaffs when required), AED, and first aid kit
    - If the rescue kit does not include additional gaffs when working on a spar, an access line should be present
- Crew has required fire equipment onsite
    - Fire gear will be required onsite, regardless of tier (e.g., 1, 2 or 3)
    - Check HASP/SCE policy on required fire
    - Tools shall be located within 25 feet of the crew/drop zone

- If work occurs on US Forest Service Land, per the Operations and Maintenance Plan for Electric Facilities (Dec 2018), “for each piece of equipment used the crew shall have the following emergency use hand tools or equipment:
    - One shovel, one axe (or Pulaski), a fully charged chemical or compressed air foam fire extinguisher Underwriters Laboratories minimum rating of 2A:10 B:C on each truck, personnel vehicle, tractor, grader, and other heavy equipment.
    - At least one 4A:80-B:C fire extinguisher or equivalent on each mechanized harvesting machine with hydraulic systems, powered by an internal combustion engine (e.g., chipper, feller/buncher, harvester, forwarder, stroke delimber).
    - One shovel and one filled 5-gallon or larger backpack-pump type fire extinguisher with hand pump for each welder.
    - One shovel and one 16-ounce or larger pressurized chemical fire extinguisher when using gasoline-powered tools, including but not restricted to chainsaws, soil augers, and rock drills. Fire tools shall at no time be farther from the point of operation of the portable gasoline-powered tool than 25 feet, or closer than 10 feet, with unrestricted access for the operator from the point of operation. Fire extinguishers shall be a standard multi-use extinguisher unless otherwise specified. The shovel must be kept on hand when chainsaws are used off cleared landing areas.
    - All tools and equipment required above shall be in good working condition and shall meet Forest Service requirements for fire tools as follows: Shovels shall be a size “0” or larger and no less than 46 inches in overall length. Axes (or pulaskis) shall have 2-1/2 pound or larger heads and be no less than 28 inches in overall length.
    - Concentrations of wood dust and debris shall be removed from all equipment daily or more frequently as required. Standard tools must be kept directly accessible to workers at all times when engaged in work activities described in this Fire Plan.”
- Crew has necessary tools/equipment onsite and are using them appropriately
    - Refer to HASP based on work activity and equipment being used for description of expectations
    - Tools are properly maintained in good working order
- Crew communicates effectively
    - All crewpersons participate in the worksite tailboard, including updates.
    - Any additional crew members joining the job site after operations have commenced, shall be briefed on the tailboard by any of the original crew members and shall sign the tailboard/JSA, prior to engaging in work activities. This includes ground personnel, equipment operators and external supervision.

    - Crew communicates when entering/exiting drop zone using effective communication
    - Crew maintains communication with Traffic Control crew, when present
    - Workers aloft and engaged observers maintain audible/visual communication when a hazard is identified (e.g., MAD encroachment), when repositioning near electric hazards, etc.
- Crew remains out of the bight (i.e., pinch points, line of fire)
    - The crew assesses work activities/equipment for potential pinch points and discusses them during tailboard (e.g., ropes area kept clear of debris piles for chipping, ropes are not wrapped around hands during rigging operations, crewmembers are stationed outside the drop zone during felling operations, etc.)
    - The crew watches out for one another and calls an ALL STOP if anyone is in the bight or line of fire.
- Crew maintains and orderly and thoughtful worksite, free of debris and tripping hazards
    - Refer to housekeeping section of the HASP
    - All tripping hazards (such as raised sprinklers) are demarcated by a cone so that they are easily observed and avoided by crew members
    - Work sites (e.g., customer yards) are left in the same condition as when the crew arrived. All debris is hauled off site and a rake/blower is used to collect and manage smaller debris.
- Tools onsite are inspected, in good condition, and properly rated
    - Refer to HASP for specific tool inspection and rating requirements
    - A mixture of 30% distilled water with 70% ethanol alcohol shall be used to disinfect trimming equipment between trimming of each tree.
    - At a minimum, tools to be used will be visually inspected prior to leaving the yard, prior to use, and at the end of the day when stored
    - Additional documentation of inspection is required for commercial vehicles (daily pre-trip inspection), fire extinguishers (monthly), fall protection (annually), non-conductive tools (tested every 2 years)/boom (tested every 1 year)
- Crew is wearing PPE required for task at hand
    - Refer to Section 7 of the HASP for PPE required for specific tasks (e.g., chainsaw operation)
    - At a minimum: Hard hat, safety glasses, safety vest/boots (class 2 or 3), and ear protection, long pants
- Surrounding conditions are safe to work
    - Prior to work, the crew assesses weather (wind, excessive heat), terrain/tripping hazards, biohazards, air quality, homeless encampments, red list, etc. and use stop work authority as needed. Any remaining hazards are documented in the tailboard and mitigated prior to start of work.
    - Maintain contacts for the SSP, ESOC, DOC, and ESD for any additional support.

Atmosphere

- Crew has ample water and shade onsite
    - OSHA recommends 2.5 gallons of water per person per 8-hour shift and 3 gallons of water per person, per 10-hour shift
    - Shade shall be available when temps are above 80 degrees (vehicle with AC can be used if no shade is available)
    - When the temperature equals or exceeds 95 degrees, additional preventive measures apply such as taking required 10-minute breaks every two hours, supervisory observations of 20 or fewer employees, mandatory buddy system, pre-shift meetings on prevention.
    - Newly assigned employees assigned to heat areas shall be closely observed for the first 14 days of employment
    - Crews should be well trained to identify symptoms of heat stroke and exhaustion
    - The ability to perform self-assessments to identify personal symptoms of heat stroke and exhaustion
- Weather is conducive and safe for planned activities
    - Working aloft requires special precautions when working near energized conductors when wind is greater than 25 MPH
    - Use of heavy equipment (e.g., Sennebogen) is prohibited when wind is greater than 25 MPH
    - Work is restricted on SCE circuits identified in PSPS communications
    - Work is prohibited during thunder/lightning storms when lightning has hit within a 10-mile radius. The crew will seek safe cover for at least 15 minutes before resuming work.
    - During red flag warnings, no mechanical work shall be performed in tier 2/3 fire areas (*exception: emergent work is requested*). In US Forestry lands, PAL levels adherence per agency fire management plan.

TRAFFIC

Moving Vehicles

- Crew has a traffic control plan on site (if required)
    - Traffic control plan is onsite with the traffic control crew and/or tree crew tailboard form
    - Traffic control is implemented per SCE Major Traffic Control Guidance Document
    - Refer to CAMUTCD 2014-rev6 Section 6C.01 Temporary Traffic Control Plans
        - Provisions for effective continuity of accessible circulation paths for pedestrians including alternative routes, access to temporary bus stops, travel across intersections, etc. Barriers and channelizing devices that are detectable by people with visual disabilities should be provided.

    - Traffic control should provide access for public transit buses, which cannot efficiently be detoured in the same manner as other vehicles (particularly for short-term maintenance projects).
- Pedestrian/Bicyclists are diverted around work site or escorted through work site
    - Motorists, bicyclists, and pedestrians should be guided in a clear and positive manner while approaching and traversing TTC zones and incident sites. Assigning someone the responsibility to assist pedestrians with disabilities through the project limits.
    - Pedestrians are not led into conflicts with vehicles, equipment, and operations.
        - Consideration should be made to separate pedestrian movements from both worksite activity and vehicular traffic. Unless an acceptable route that does not involve crossing the roadway can be provided, pedestrians should be appropriately directed with advance signing that encourages them to cross to the opposite side of the roadway. In urban and suburban areas with high vehicular traffic volumes, these signs should be placed at intersections (rather than midblock locations) so that pedestrians are not confronted with midblock worksites that will induce them to attempt skirting the worksite or making a midblock crossing.
    - Crew minimizes their exposure to traffic in high-risk traffic areas when possible
        - Work equipment, workers' private vehicles, materials, and debris should be stored in such a manner to reduce the probability of being impacted by run-off-the-road vehicles.
        - Minimize crew time on the street side of the vehicle (e.g., tools/gear that is necessary for the job and accessed frequently should be stored on the curb side of vehicles to minimize crew time on the street side of the vehicle).
    - Position vehicles as barriers where possible
        - Where the work site is exposed to possible run-off-the-road vehicles, crews should stage vehicles/heavy equipment between traffic and people within the work site.
    - Crew has sufficient space to work safely within the conned-off area
        - The delineated work area and drop zones are large enough for the crew to freely walk (including escape paths from run-off-the-road vehicles), stage and manage debris, and chip/haul debris.
    - Crew members face oncoming traffic when feasible
        - From arrival onsite through site clean-up and demobilization, crews should maintain situation awareness of changing traffic conditions and possible run-off-the-road vehicle hazards (e.g., look toward traffic).
        - When vehicles are allowed to pass though/near the edge of the work area, consider stopping work to allow the vehicle to pass before resuming activities (e.g., chainsaw operation or chipping at curbside/street).

    - Consider using a spotter when setting up worksite/traffic cones on the street side of vehicles and equipment.
- Crew is wearing high visibility clothing
    - DOT-Traffic Operations Policy Directive: Section 6E.02 High-Visibility Safety Apparel Standard: For daytime and nighttime activity, flaggers shall wear high-visibility safety apparel that meets the Performance Class 2 or 3 requirements of the ANSI/ISEA 107-2015 publication entitled "American National Standard for High-Visibility Apparel and Headwear" (see Section 1A.11), or equivalent revisions, and labeled as meeting the ANSI 107-2015 standard performance for Class 2 risk exposure. The apparel background (outer) material color shall be either fluorescent orange-red or fluorescent yellow green as defined in the standard. The retroreflective material shall be orange, yellow, white, silver, yellow-green, or a fluorescent version of these colors, and shall be visible at a minimum distance of 300 m (1,000 ft). The retroreflective safety apparel shall be designed to clearly identify the wearer as a person.
- Flaggers/Workers are in a safe location with pre-determined escape route
    - All workers should be trained in how to work next to motor vehicle traffic in a way that minimizes their vulnerability.
    - Temporary traffic cones should be placed along the workspace.
    - Reducing the speed of vehicular traffic, mainly through regulatory speed zoning, funneling, lane reduction, or the use of uniformed law enforcement officers or flaggers, should be considered.
    - Planning the internal work activity area to minimize backing-up maneuvers of vehicles should be considered to minimize the exposure to risk.
    - Flagger stations shall be located such that approaching road users will have sufficient distance to stop at an intended stopping point. The flagger should identify an escape route that can be used to avoid being struck by an errant vehicle.
    - Except in emergency situations, flagger stations shall be preceded by an advance warning sign or signs. Except in emergency situations, flagger stations shall be illuminated at night.
    - When arriving at a jobsite, all vehicles, if possible, must be staged so that they are facing towards the evacuation route.
- Boom avoids being positioned over lanes of passing traffic or pedestrian paths when possible
    - ANSI Z133-2017 5.2.19 Clearances from passing vehicles shall be maintained or traffic control shall be provided when booms or platforms are operated over roads in accordance with the MUTCD, Part 6, federal, state or local, as applicable.

- Engaged spotter watched for high-profile vehicles, while the boom in low over the roadway (e.g., box trucks, high profile vehicles, boom trucks, and semi-trucks).
    - Refer to “Crew actively uses a competent, engaged observer” under Basic Site Safety > General Requirements.

CLIMBING

Fall from Heights

- Crew actively uses a competent, engaged observer when climber ascends above 12 feet.
    - From the HS Handbook for contractors: “…an engaged observer is present at any time a worker is performing duties in the air (working from an aerial device or climbing a tree). An engaged observer shall be solely focused on the worker in the air and must be free from other activities, duties, and distractions. The engaged observer shall be within visual and voice communication and must maintain visibility of the worker/equipment as well as the proximity to all hazards, especially energized conductors.”
    - Engaged observer shall maintain situational awareness of the worker aloft and job site conditions and monitor for changes in hazard conditions.
    - Maintain visual contact with climber, electric facilities, and other hazards
    - Communication between the climber and engaged observer is audible (e.g., verbal, whistle), and/or physical (e.g., hand signals).
    - Engaged observer shall call “Stop Work/All Stop” when a new safety concern is identified, assist the climber, mitigate the hazard, and update the tailboard form, as needed.
- Fall protection equipment is in good condition
    - Climber inspects fall protection and climbing gaffs prior to use
    - Ropes are inspected according to the manufacturer´s recommendation.
    - Ropes are visually inspected and felt for stiffness/firmness because of shock loading/friction that could indicate damage
    - Any equipment identified with defects shall be pulled from service and red tagged.
    - Fall protection removed from service if there are cuts in ropes, stitching coming out of saddles (especially the critical “man-rated” stitching that holds the climber), excessive wear on saddle, burrs on carabiners, splices lumpy or malformed, etc. Refer to HASP for details.
    - Daily inspections are conducted in accordance with manufacturers' specifications.
- Tree hazard assessment has been completed prior to climb
    - Crew performs a 360-degree visual inspection (when possible) of tree for soundness and integrity. Fruiting bodies and weak attachments may indicate an unhealth tree that is not safe to climb.

    - Tree defects/hazards and associated mitigation shall be documented on the pre-work tailboard.
- Climber is using double tie-in when cutting tools are in use
    - 100% tie in while aloft (at all times)
    - Double tie-in with a lifeline and a safety lanyard (or second lifeline) when in working position and using pruner, handsaw, or chainsaw
- The climber is attached to a secure anchor point tied into main leader – not a lateral branch
    - Tie in location has a diameter of 4 inches or greater. Where feasible, the leader is a minimum of 3 feet in length and angle is no less than 30 degrees.
    - Tie in point tested prior to climb (e.g., full weight and/or pull by 2 people)
    - Check leader for defects (e.g., included bark, water sprout, decay, insect damage, previous breakouts, peeling back, dead branches, etc.)
- Fall protection is correctly worn and adjusted properly
    - Before climber leaves the ground, they will be tied in
    - Snug fit and secure around the waist, per manufacturers requirement
    - Friction knot is within arm's length reach
    - Fall protection must be inspected before, and during each use by a competent person following manufacturer´s recommendations
    - When a qualified crewmember is onsite, perform a peer check of fall protection prior to climbing

Electrical Contact

- Crew actively uses a competent, engaged observer
    - Refer to "Crew actively uses a competent, engaged observer when climber ascends above 12 feet" under Climbing > Fall from Heights (above).
    - Engaged observer is knowledgeable MAD requirements and EHAT
- Climber keeps body parts and tools outside of the minimum approach distance (MAD) at all times
    - MAD is identified and documented during tailboard
    - Worker aloft faces electric facilities to maintain awareness of MAD and avoid electric facility
- Tie-in point is positioned to swing away from power lines
    - Tie in point is above climber's head whenever possible and away from power lines
    - If no suitable point on tree being climbed, consider tying into adjacent trees if safe to do so
    - Consider using a second attachment point for work positioning to prevent an uncontrolled swing
    - Engage supervisor if unable to meet this COA, refer to HASP.

- Limbs trimmed only when there is visibility of what is being cut
    - Hazards within the tree are identified and documented in the tailboard, mitigation is listed in the tailboard (may require outage or line drop, SCE line crew may also determine line covers may be appropriate to mitigate hazard)
    - Identify location of secondary service and communication lines
    - Maintain visual contact with hazards and control of body position and tools while working, adjust body position when needed (don't overextend body or pruning tools)
    - Use engaged observer to help guide work
    - Trim additional branches to establish and maintain visual contact with hazards
- Branches within the MAD are removed with approved tools/equipment
    - Refer to HASP (e.g., non-conductive pole pruner, non-conductive pole saw)
    - Special thought should be given to proper safety protocol including planned or Emergent De-energization of power line prior to any work activity anytime a tree is in contact with the power line.
- Pruner poles shall be equipped with a properly placed and rated slash cord insulator
    - Insulator is in good working condition (no cracks or chafing)
    - Insulator must be below any conductive component of the head when not in use
    - 
- Limbs cut above power lines are lowered with controlled rigging
    - Limbs/palm fronds of any size shall not be dropped where they may contact primary wire or electrical equipment (e.g., transformer)
    - Limbs less than 18 inches in length can be controlled by hand
    - Overhang limb removal is performed with controlled rigging
    - Refer to HASP re: rigging operations

TREE FELLING

General

- The crew has an effective tree removal plan in place.
    - Felling Plan documented in the JHA: Hazards, Lean, Notch & Hinge plan, established retreat route, established back cut plan, Equipment (pull rope installation on trees greater than 5 DBH, Port-o-wrap, 5:1 mechanical advantage, blocks, slings and pullies, GRC, etc.)
    - The crew completed an inspection of the tree prior to beginning work, including Height, DBH, Condition (hidden dangers/tree hazards), pull test performed Yes/No, Methods for the removal.
    - The crew completed an inspection of equipment (chainsaw) prior to work
    - Tree felled away from electrical infrastructure. Where feasible, trees are felled at a minimum 15 degrees angle away from electrical infrastructure.

Electrical Contact

- Climber keeps body parts and tools outside of MAD at all times.
    - The climber determines the maximum nominal voltage and reads a MAD chart to determine MAD, while taking into consideration elevation and weather conditions
    - MAD documented on the tailboard/JHA
- Removed Limbs and tree parts/sections are rigged and lowered to maintain clearance outside of MAD.
    - At no point during the operations should any part of the tree, equipment, or personnel break MAD

Falling Tree/Dropped Objects

- A drop zone is established, clearly marked, and enforced.
    - Prior to commencing work, the drop zone will be established, along with a three-way communication protocol.
    - The drop zone should be large enough to encompass the area where branches, palm fronds, or chunks of wood will be landing (e.g., typically at or just outside the dripline of the tree)
    - The drop zone should be delineated with adequate number of cones (or flagging on a stick when visibility is limited) to visually distinguish work area on all sides (include neighbor's yard if tree extends over fence) if possible
    - Any personnel entering the drop zone must have clear communication with the foreman working aloft and have authorization before entering and clear communication to resume work.
- Crewmembers stop work and escort pedestrians through the work area if tripping hazards exist. Crewmembers do not allow others inside the drop zone when

cutting/dropping operations are in progress. A notch and back-cut are used to fell trees over five inches in diameter at breast height (DBH)
    - The two cuts that form the notch shall meet at the apex and shall not cross that point or go beyond the point where they meet.
    - The notch cut used shall be an open face notch, conventional notch or a Humboldt notch
    - Notches shall be 45 degrees or greater and wide enough to guide the fall of the tree or trunk
    - Notch depth should not exceed one-third the diameter of the tree
    - Saw cuts made to form the notch and back cut shall leave suitable hinge wood to adequately control the fall of the tree
    - With a conventional or Humboldt notch the back cut shall be 1 to 2 inches above the apex of the notch.
- The tree is safe to rig against, if applicable.
    - Rigging points shall be assessed for their structural integrity. The work plan and the trees shall be considered relative to the forces being applied to any part of the tree, including branch attachments and anchoring roots, prior to the rigging point being chosen and established.
    - Crew performing rigging operations shall estimate the potential forces at any point in the rigging system being used (e.g., using the Green Log Weight Chart to properly determine the approximate weight of any section that could surpass the WLL of any rigging equipment). The system components shall comply with the safe working-load limits (WLL) relative to the operation and not the maximum rated capacity. The lowering line shall always be the lowest rated (WLL) component in any rigging system
    - When it is necessary to remove branches or sections of a tree, the crew shall determine whether the tree can withstand the strain of the lowering procedures. If the determination is that it cannot do so, other means of removing the tree shall be considered.
- Safe distances are enforced (1.5x for rope pullers & 2x for non-essential)
    - A drop zone/landing zone shall be established prior to all felling operations. All crew members involved in the felling operation must be positioned at 1 ½ times the height of the tree. Any other observer must remain 2 times the height of the tree for felling operation.
- Clearly established and cleaned escape route for all workers.
    - A planned escape path for all workers involved in the tree removal operation shall be prepared before piecing down pieces or manual tree felling.
    - During manual tree felling, the preferred retreat/escape path for the chain saw operator is 45 degrees on either side of a line drawn opposite the intended direction of the fall.
    - To the extent practical, the retreat/escape path shall be cleared of obstructions and objects that would hinder retreat (debris, snow/ice, uneven terrain).

    - Chainsaw operator should perform a dry run/test escape path before making the back cut.
    - The chainsaw operator shall use this path for egress once the felling cuts have been completed and before the tree begins to fall (e.g., is pulled over).
    - Other involved workers shall have and use retreat/escape paths that do not hinder other retreating workers or expose any involved workers to increased hazard.
    - When manually felling trees, 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 toward a retreat/escape path.
- Feller retreats via escape route as soon as tree begins falling.
    - After making the back cut, cutter retreats from tree and gives puller(s) the OK to pull tree down
    - When the tree or trunk begins to fall, the worker at the base of the tree shall immediately move a safe distance away from the tree or trunk using the retreat/escape path
    - During manual tree felling, the preferred retreat/escape path for the chain saw operator is 45 degrees on either side of a line drawn opposite the intended direction of the fall.
- Crew assesses for new hazards before moving into the danger zone.
    - After the tree or stump has been felled the crew should visually inspect the work site (potential for log to shift, other damaged trees, new debris, overhead hazards, etc.). Any new hazards should be documented on the JSA with a mitigation plan to avoid injuries or incidents.
- Crew uses a pull rope as needed on trees greater than five inches in DBH.
    - A rope shall be attached to all trees and stems greater than 5 inches in diameter at breast height (dbh) being felled to provide stabilization and/or directional pull where assisted directional felling is required.
    - When there is risk of damage to property from a tree piece or tree falling in an unintended direction, rope (s), block and tackle, come along / winches, or other appropriate devices shall be used to control the direction of fall.
- Crew uses appropriate rigging to avoid unintentional fall direction.
    - ANZI Z133 standards shall be followed, when there is a risk of damage to property from a tree piece or tree falling in an unintended direction, rope(s), block, and tackle, come-along/winches, wire cable (except where an electrical hazard exists), or other appropriate devices shall be used to control the direction of fall.
    - Loaders, skid steers, or other heavy equipment shall not be used to push trees over.

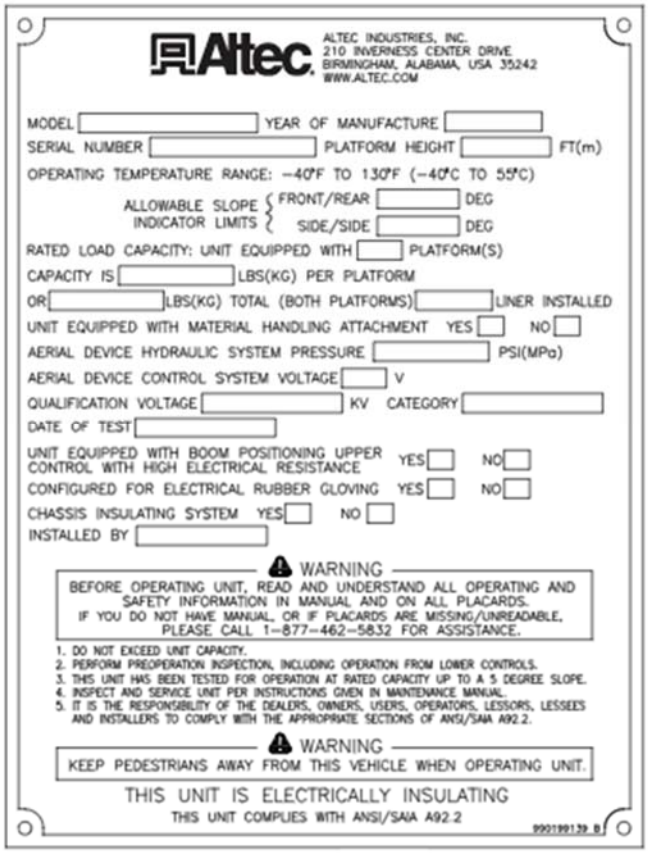
AERIAL LIFT

Falling Objects

- Crew actively uses a competent, engaged observer
    - Refer to “Crew actively uses a competent, engaged observer when climber ascends above 12 feet” under Climbing > Fall from Heights (above).
- A drop zone is established, clearly marked and enforced
    - Refer to Refer to “A drop zone is established, clearly marked and enforced” under Tree Felling > Falling Tree/Dropped Objects (above).
- Tools used aloft are secure when not in use
    - Handsaws are placed in saddle pocket scabbard when not in use
    - Pole pruner secured with no potential to swing when not in use
    - Tools will be secured when not in use from work zone (e.g., Do not hang pole saw on a limb by the rear hook)
- Crew communicates effectively
    - All crew members participate in and sign tailboard. Any additional crew members joining the job site after operations have commenced shall be briefed on the tailboard by any of the original crew members, and shall sign the tailboard/JSA, prior to engaging in work activities, this includes ground personnel, equipment operators.
    - Communication methods discussed and established with traffic control crews
    - Effective communication (e.g., whistles, hand signals, blue tooth helmets, radios) are established and used throughout work and when entering/exiting the drop zone.

Fall from Heights

- Crew actively uses competent, engaged observer when work is above 12 feet
    - Refer to “Crew actively uses a competent, engaged observer when climber ascends above 12 feet” under Climbing > Fall from Heights (above).
- Aerial device is set up securely and on stable ground
    - Verify equipment position on even surface and does not exceed 5 degrees of tilt or recommended manufactures specifications.
    - Crew considers terrain, weather, slopes, and hazards including public safety hazards, when choosing best site to place truck
- Wheel chocks, outriggers, and pads are used as required
    - Wheel blocks/chocks must be in place when truck is parked in any position and consideration should be given to uphill and downhill positions placing wheel chock on proper side of tire (e.g., wheel chocks shall be placed on the downhill slide of the rear tires).
    - Outriggers with pads used when working aloft, at all times

- Fall protection is worn correctly
    - Refer to “Fall protection is correctly worn and adjusted properly” under Climbing > Fall from Heights (above).
- Fall protection equipment is in good condition
    - To manufactures specifications
    - Without any modifications made
- Fall protection equipment is attached to bucket anchor
    - Only use anchor point designed by the manufacturer
    - Clip in prior to entering bucket
- Load is within capacity of aerial lift
    - Check equipment specifications for capacity limits (the capacity limits for most buckets is ~350lbs)
    - 

    - Person + equipment + large logs/limbs do not exceed manufactures workload recommendations
    - The aerial lift is not to be used to carry logs/debris unless it is designed for that purpose and the load capacity is not exceeded.
- Arborist stands firmly on the floor of the bucket at all times.
    - No platforms or debris inside bucket that would cause arborist not to be standing on floor
    - No hanging over the side of bucket
    - No climbing spurs in bucket

Electrical Contact

- Crew actively uses a competent, engaged observer when electrical hazards are present.
    - Refer to “Crew actively uses a competent, engaged observer when climber ascends above 12 feet” under Climbing > Fall from Heights (above).
- Climber keeps body parts and tools outside of the MAD at all times.
    - Refer to “Climber keeps body parts and tools outside of the MAD at all times” under Climbing > Electrical Contact (above).
    - Lift shall not make direct contact with pole, communication wires, secondary wires, guy wires, etc. Lift shall maintain MAD
- Limbs trimmed only when there is visibility of what is being cut.
    - Refer to “Limbs trimmed only when there is visibility of what is being cut” under Climbing > Electrical Contact (above).
- Branches within the MAD are removed with approved tools/equipment.
    - Refer to “Branches within the MAD are removed with approved tools/equipment” under Climbing > Electrical Contact (above)
    - Dielectric test is current and available for review on the vehicle
- Limbs cut above power lines are dropped with control.
    - Refer to “Limbs cut above power lines are dropped with control” under Climbing > Electrical Contact (above)

LADDERS

Fall from Heights

- Crew actively uses a competent, engaged observer
    - Refer to “Crew actively uses a competent, engaged observer when climber ascends above 12 feet” under Climbing > Fall from Heights (above).
- Ladder is in good condition.
    - No strains, abrasion, cracks (UV damage), rungs not bent or damaged
    - The Ladder must have safety feet/cleats in operable condition and slip resistant padding must be on bottoms of feet/cleats
    - ANSI Z133 - Section 7: Ladders shall be supported while in storage to prevent sagging. Except when on mobile equipment, ladders should be stored under suitable cover, protected from the weather, and kept in a dry location away from excessive heat
- Ladder is securely placed on stable ground
    - Non-slip rubber pad on footing of ladder
    - Ladder is held by second person while climber is ascending
    - Ladder is secured while climber is ascending (secure the ladder to the tree/palm)
    - 4:1 ratio, horizontal/vertical lean
- Climber maintains three points-of-contact while ascending/descending
    - Climber does not stand on top rung, or last 3 rungs on extension ladder, refer to manufacture specs

    - Fall protection is required when transferring from ladder to tree. Fall protection can be installed from the ground or once the climber reaches the tree while standing below the top 3 rungs. The work positioning lanyard or climbing rope must be installed before transferring to the tree/palm tree.
    - Fall protection must be used if any work will be performed from the ladder

Electrical Contact

- Crew actively uses a competent, engaged observer when electrical hazards are present.
    - Refer to “Crew actively uses a competent, engaged observer when climber ascends above 12 feet” under Climbing > Fall from Heights (above)
- Limbs trimmed only when there is visibility of what is being cut.
    - Refer to “Limbs trimmed only when there is visibility of what is being cut” under Climbing > Electrical Contact (above).
- Crew uses a non-conductive ladder.
    - No aluminum or wood ladders, no conductive material
- Climber keeps body parts and tools outside of the MAD at all times.
    - Refer to “Climber keeps body parts and tools outside of the MAD at all times” under Climbing > Electrical Contact (above)
- Climber avoids contact with phone/communication lines or pole at all times.
    - Ladder is not leaning on poles or communication lines
    - Climber does not make direct contact with communication lines
    - QEW required for vine removal on poles (Davey and Rolling Green are the source contractors)

VEHICLES

General Requirements

- Driver is qualified for the vehicle
    - Driver has a valid commercial driver's license
    - Driver is fit for duty including the ability to clearly see vehicle path and reach all necessary vehicle components (brakes, mirrors, “liberty wedge”, etc.)
- Vehicle is not parked on combustible material
    - Dead and/or combustible materials shall be kept clear of hot and/or operating equipment
- Vehicle is in good condition
    - Pre- and post-trip inspections shall be performed. If the inspection reveals a defect that could affect the safe operation or hauling of the equipment, the equipment shall be removed from service.
    - Equipment shall be inspected and maintained by employer authorized personnel
    - Dielectric test is current and valid (if applicable)

- Unattended vehicles and trailers are secured
    - When arriving at a jobsite, all vehicles, if possible, must be staged so that they're facing towards the evacuation route.
    - Traffic cones and wheel chocks must be set up on each vehicle
    - When equipment is left unattended, attachments should be stowed, cradled, or lowered to the ground and keys must be removed from the ignition.
    - When the brush chipper is disconnected from the truck the wheels must be choked.
    - Traffic cones must be set up on each vehicle

Trailers and Loads

- Loads are secure
    - Loads on vehicles should be secured against movement with appropriate lashing/chains.
    - Ensure the vehicle can handle the load capacity according to the vehicle's axle-load (do not overload or create an unsafe "top heavy" condition)
    - Ensure the load platform is in good working condition.
    - Check the load periodically during transport (e.g., fueling break)
    - Each time cargo is loaded, moved, or removed, reassess and re-secure the remain load
    - Never lift an attachment above a person as the load could shift or fall unexpectedly
    - Never lift the load so high that it could fall out of the attachment and land on the equipment's cab
- Trailer is in good condition prior to moving
    - Pre- and post-trip inspections shall be performed. If the inspection reveals a defect that could affect the safe operation or hauling of the equipment, the equipment shall be removed from service.
    - Equipment shall be inspected and maintained by employer authorized personnel
- Trailer connections to vehicle are secure prior to moving the vehicle
    - Trailer securely coupled to the hitch
    - Cross chains underneath hitch and coupler with enough slack to permit turning and to hold tongue up if the trailer comes loose
    - Fasten chains to frame of tow vehicle. Provide enough slack in chains to permit tight turns, but not be close to the road surface to drag
    - Emergency breakaway brake lanyard attached
    - Trailer brake lights/signals are working
- Chains and tie-downs are appropriate, used correctly, and in good condition
    - Safety chains are provided so that control of the trailer can be maintained if trailer comes loose from the hitch
    - Visually inspect the safety chains and hooks for wear or damage. Replace worn or damaged safety chains and hooks before towing

    - Cross chains underneath hitch and coupler with enough slack to permit turning and to hold tongue up if the trailer comes loose
    - Fasten chains to frame of tow vehicle. Provide enough slack in chains to permit tight turns, but not be close to the road surface to drag. Do not twist chains to achieve proper slack.

Collision

- Environment is safe before moving
    - Always survey the area you are working in prior to operating the equipment. Make a note of all potential obstacles such as stumps, branches or pipes that could cause a rollover, or even objects that could penetrate the cab
    - Always survey the road conditions or the area where the vehicle is to be operated, as inclement weather conditions may create hazardous conditions.
    - Ensure your vehicle is safe to operate according to the weather and terrain conditions.
    - Always pre-inspect the immediate area around and under the vehicle before moving (e.g., circle of safety).
- Driver maintains safe speed and following distance
    - Follow all traffic laws including posted speed limits
    - Always maintain a safe following distance
    - Be alert for slippery road conditions
    - DO NOT ride the brakes as this can cause overheating of the pads
- Driver uses turn signals as appropriate
    - Any signal of intention to turn right or left shall be given continuously, during the last 100 feet traveled by the vehicle before turning
- Driver removes all distractions prior and during driving
    - Drivers shall not use their cell phone while driving
    - Drivers shall not eat or drink while driving
    - Drivers must ensure any cargo being transported has been properly secured, including all items transported in the cab.
- Driver parks in direction of egress whenever possible
    - When arriving at a jobsite, all vehicles, if possible, must be staged so that they are facing towards the evacuation route.
- Driver uses a spotter when backing or otherwise as necessary
    - Trucks towing equipment should be backed up only when absolutely necessary
    - Use a spotter every time one is available
    - Check rearview mirrors frequently to observe trailer and traffic
    - When the operator's view of hazards may be obstructed, a walk-through inspection of the area where the equipment will travel shall be performed
    - Be aware of vehicle and trailer height, especially when approaching bridges, roofed areas, and trees

Rollover

- Maintaining a balanced load (at all times)
    - Load will not exceed manufacturer recommended weight
    - Wood chips shall be evenly distributed in chip box
    - Wood log/Palm trunks will be placed so they will not shift while being transported
- Speed is appropriate for high centers of gravity
    - Slow down when approaching a turn/bend in the road and maintain a safe speed (or below) through the turn (consider possible changes/shifts in load heading into the turn)
- Driver approached turns at a safe speed
    - Slow down when approaching a turn/bend in the road and maintain a safe speed (or below) through the turn (consider possible changes/shifts in load heading into the turn)
- Driver keeps wheels on the road, except when entering a worksite (e.g., driving over grates etc.)
    - Use a spotter when driving on uneven surfaces
    - Consult SCE Environmental Department (ESD) for appropriate approvals to drive off road/overland travel
- Ensure nearby shoulder is safe prior to pulling off the road
    - Use a spotter when unsure of terrain
    - Do not drive near eroded ruts or on muddy ground (keep two wheels on the road!)
    - Do not drive over or park on flammable material
- Driver manages appropriate gear and speed on declines
    - Maintain a safe speed depending on load
    - DO NOT ride the brakes as this can cause overheating and brake failure
    - Slow down when approaching a turn/bend in the road and maintain a safe speed (or below) through the turn (consider possible changes/shifts in load heading into the turn)

CHIPPERS

General

- Crew ensures chipper location and activity do not compromise safety of workers.
    - Chipper not placed within drop zone or drip line of the tree, where applicable
    - Chipper operations do not interfere with engaged observer duties and effective communication between crew members
    - Chipper operations not performed during aerial operations (exceptions for certain backyard scenarios where chipper is staged well outside drop zone, multiple crew members working, no entry into active drop zone required, etc.)

Caught-In/Between

- Crew clears chipping area, brush, and brush-hauling paths of ropes and other obstacles.
    - Good housekeeping, work area free of tripping and impalement hazards (e.g., no tools, equipment or ropes placed within 10' of the chipper or staged debris meant for chipping, where feasible).
    - All ropes must be accounted for and moved to a safe location away from the chipping area.
    - Crew checks debris to be chipped for foreign objects and removes objects that should not be chipped prior to initiation of chipping activities
    - If more than one person is feeding the chipper at a time, there is a clear plan and communication to avoid tripping/slipping hazards created by dropping brush on the way to the chipper
- Crew uses tear away vests only while chipping; loose clothing and jewelry are removed prior to chipping.
    - Eye protection, hearing protection, non-slip footwear, head protection
    - Tuck in shirt and/or tight-fitting clothing
    - No gauntlet-like gloves, vest
- Safety bar and/or emergency stop system is in place and working (if applicable).
    - Engage crew discussion on location and use of safety features (e.g., safety bar forward, neutral, and reverse and the emergency all stop button)
    - Scan ISN badge and validate chipper training is current
    - The proper function of the safety device should be inspected before operation
- Crew uses a push stick to move small debris into chipper.
    - Crew does not extend body or limbs 50% past plane of infeed tray
    - No body parts past curtain, where applicable
    - There must never be more than an arm length of operator's body inside hopper/feed table area while chipping.
    - Use industry acceptable push stick for working the debris inside chipper and on feed table. It is also acceptable to fashion a sturdy tree part branch into an acceptable push stick.
    - Chipper winch line is in good condition and load does not exceed manufactured limits
- Lock-Out Tag-Out of chipper during maintenance, when not in use, or when clearing a jammed chipper.
    - Person performing maintenance shall have the keys in their pocket/possession
    - Wait until chipper is completely stopped before opening maintenance panels

Struck By

- Chipper is fed away from traffic (curbside) and branch is fed butt-end first.
    - Work area sufficiently demarcated for safety
    - Feed chipper from the right side. At NO time should chipper be fed from rear or center of feed table in the feed direction.

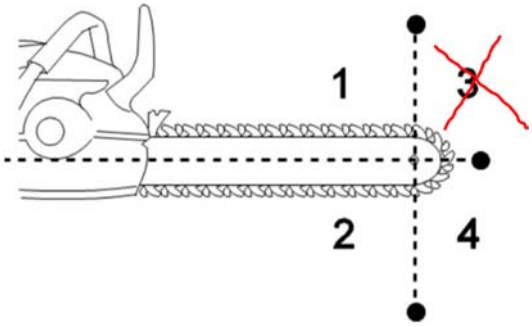
    - If more than one person is feeding the chipper at a time, there is a clear plan and communication to avoid chipping from the front
    - Branches are of suitable size for the type of chipper in use (e.g., up to 6-inch branch for self-feeding chippers otherwise 2–3-inch diameter branches are typical)
- Crew stands to the side of the chipper while chipper is in operation.
    - Do not walk behind chipper while debris is being chipped, stop work if necessary to allow safe passage
    - Work area sufficiently demarcated for safety
- All chipper guards and covers are in place and in good condition.
    - Panels, guards, covers in place when chipper is in operation (5.3.2 ANSI - Engine and all moving parts stopped, and ignition key removed and pocketed
    - Chipper guards have no wear, no rips, and function properly before chipper use.
    - Safety decals visible
- Crew stands clear of discharge of the chipper.
    - Work area sufficiently demarcated for safety
    - Crew enforces work area limits including public access. Keep all personnel and public positioned to the side of the chipper to avoid any kick back safety hazard including mechanical and blade failure.
    - Crew ensures the chipper chute is properly angled to direct flow of debris into the catch box area, while chipping to minimize or eliminate any loose debris from flying into unprotected work areas
    - Truck must be dumped or unloaded to minimize spillage should box area reach capacity

CHAINSAW

Laceration

- Crew is using proper PPE for chainsaw use
    - PPE: Cut-resistant leg protection (Saw Chaps meeting or exceeding ASTM F1897 and F1414), hearing protection (earplugs), ANZI-Z133 (ANSI Z87.1) safety glasses, (ANSI Z89.1) Class – E helmet, gloves (no gauntlet style gloves are allowed).
    - Only trained and qualified employees are authorized to operate a chainsaw
- Chainsaw safety devices are in place and properly functioning
    - Chainsaws shall not be operated unless the manufacturer's safety devices are in proper working order. At no time shall these safety devices be removed or modified.
- Crew starts the chainsaw properly (i.e., does not drop-start)
    - A chainsaw shall never be started closer than 10 feet from any fuel source or another person.
    - A chainsaw shall be started with the chain brake engaged and with the Operator holding the saw firmly in a manner that minimizes movement during start up.

        - Example: When worker is in the tree, operator places chainsaw against a limb, locks the chainsaw in between the legs, or locks their arm away from the body and does not bend the elbow when starting the chainsaw. When working from a bucket, the operator places chainsaw against a limb or locks their arm and starts chainsaw outside the bucket.
    - Drop starting a chainsaw is prohibited.
- Crew uses two hands when operating a chainsaw
    - Operator does not one hand the chainsaw
    - Thumbs wrapped around bar to maintain control
- Crew maintains a stable body position when using a chainsaw
    - The Operator shall ensure they are in a stable position prior to starting a cut.
    - Never stand on debris, stumps, or downed trees when operating a chainsaw.
    - The Operator shall never make a cut with a chainsaw above should height unless they can demonstrate that a greater hazard is posed by not making an above the shoulder cut.
- Chainsaw is held with lower quadrant of the bar to avoid kickback (e.g., avoid cutting with the upper quadrant)
    - The chainsaw operator shall not cut with the upper quadrant of the bar to avoid kickback.



    -
- Crew keeps body parts out of the chainsaw line of fire
    - Operator stays away from the kickback trajectory while cutting
    - When cutting close to the ground, bring your knee down to keep your upper body away from the kickback trajectory
    - Always maintain the right hand on the throttle, do not switch hands on the handles.
- The body of the chainsaw is within the operator's power zone (e.g., shoulder to knee height)
    - Chainsaw is not operated over shoulder height or below knee height except when log bucking and limbing
- When not in use, the chain brake is engaged, and the engine is off
    - Do not leave the chainsaw running when not in use (e.g., the chainsaw shall not be on when in a scabbard).

    - Operator does not take more than 3 steps with the chainsaw on.
- Crew carries the chainsaw in a safe manner
    - Chainsaws should be carried in a manner to reduce the risk of the operator being injured by contacting any of the sharp or hot surfaces of the saw.
    - The chain brake shall always be engaged, or the engine shut off.
    - The most common, accepted practice is to hold the front handle with the left hand with the bar facing the rear.
    - When walking down a steep hill the most accepted way of carrying a saw is to hold the saw by the top handle with the right hand and the bar facing forward.

Fall from Heights

- Climber is using a second tie-in when operating a chainsaw aloft
    - Refer to "Climber is using double tie-in when cutting tools are in use" under Climbing > Fall from Heights.

Dropped Objects

- When not in use, chainsaw is secured against falling
    - Lanyards may be used to secure chainsaws when not in use
    - While working aloft in aerial device use bucket scabbard to secure chainsaw

Fire

- Chainsaws have both a muffler and a spark arrestor and a hot saw is not set on combustible material
    - Spark arrestors are mesh screens that prevent the emission of flammable debris from the chainsaw that may ignite a fire
    - 
    - Mufflers help control noise coming from the chainsaw during work
    - Chainsaw is set on bare mineral ground or other non-flammable surface (e.g., concrete)
- Saw operator moves at least 10 feet from the fueling station before starting the saw
    - Fuel station with appropriate spill containment is stationed a minimum 10 feet away from chainsaw when started/in operation

PALMS

General

- Pre-climb and trim assessment done
    - Refer to “Tree hazard assessment has been completed prior to climb” under Climbing > Fall from Heights (above).
    - Identify any electrical hazards running through the palm skirt and call for an outage or line drop to avoid potential spark/fire hazard, as needed
    - Note: Look for signs of animal use including rat nest, woodpecker cavities, opossum nest, owl nest. etc. Full shag/skirts on palms can hide signs of decay. Use a throw ball and perform a pull test prior to climbing.

Fall from Heights

- Crew actively uses a competent engaged observer during climbing activities
- Crew has completed a pre-climb assessment of the palm and all climbing gear (gear replaced as needed)
    - Refer to “Tree hazard assessment has been completed prior to climb” under Climbing > Fall from Heights (above)
    - Refer to “Fall protection equipment is in good condition” under Climbing > Fall from Heights (above)
- Climber is tied into main trunk/stem with an Adjustable False Crotch (AFC) or choking configuration
    - The only approved methods to create a cinching configuration are as follows:
        - The use of an adjustable false crotch, or
        - The use of a running bowline with proper termination for Stationary Rope System (SRS).
        - If a climbing Moving Rope System (MRS) additional friction must be created to avoid potential damage to the cordage or misuse of MRS device. The climber shall only use this technique when the adjustable false crotch is not long enough due to the tree’s diameter.
- Climber’s tie-in point/primary suspension point prevents lateral movement of the climb line
    - Tie-in point shall be positioned in a manner where it will not shift (e.g., in the crown of the palm and between fronds to prevent movement)
- Climber is 100% tied-in at all times (ascending, descending, repositioning)
    - Refer to “Climber is using double tie-in when cutting tools are in use” under Climbing > Fall from Heights (above)
- When repositioning, climber preloads new tie-in points with his/her full weight before releasing current means of secure tie-in
    - New tie-in point tested with full body weight prior to release and reposition of secondary/double tie in point
- Climber is using double tie-in when cutting tools are in use

    - Refer to “Climber is using double tie-in when cutting tools are in use” under Climbing > Fall from Heights (above)
- Climber is supported by an arborist climbing system positioned above the skirt
    - Use SRS to climb over the palm skirt. Once positioned at the top, set AFC/climb line.
    - Never climb under the skirt or remove palm skirt from the bottom to avoid suffocation hazard.

Electrical Contact

- Crew actively uses a competent engaged observer
    - Refer to “Crew actively uses a competent, engaged observer when climber ascends above 12 feet” under Climbing > Fall from Heights (above
- Climber keeps body parts and tools outside the MAD at all times as determined by qualification
    - Refer to “Climber keeps body parts and tools outside of the MAD at all times” under Climbing > Electrical Contact (above).
- Fronds cut above powerlines dropped or lowered with control
    - Refer to “Limbs cut above power lines are dropped with control” under Climbing > Electrical Contact (above)
    - Dead/dry fronds 2 feet over the skirt are removed by handsaw or chainsaw
- Fronds in contact with wire removed with non-conductive tool equipped with a slash cord insulator
    - Refer to “Branches within the MAD are removed with approved tools/equipment” under Climbing > Electrical Contact (above)

Falling Objects

- A drop zone is established, clearly marked, and enforced
    - Refer to “A drop zone is established, clearly marked and enforced” under Tree Felling > Falling Tree/Dropped Objects (above)
- Tools used aloft are secure when not in use
    - Refer to “Tools used aloft are secure when not in use” under Aerial Life > Falling Objects

Suffocation/Crushing

- Palm frond skirts shall be removed from the top crown
    - Use SRS to climb over the palm skirt. Once positioned at the top, set AFC/climb line.
    - Per OSHA regulation, Palm frond skirts shall be removed from the top crown 3 years and over. Palms with less than 3 year’s growth may be climbed under.