

SECTION 31

TREE MAINTENANCE AND REMOVAL

31.A GENERAL

31.A.01 Each location where tree maintenance or removal is done shall be under the direction of a qualified tree worker.

31.A.02 Working near electrical equipment and systems. > **Also see Section 11.**

- a. Employees working in the proximity of electrical equipment or conductors shall consider all such equipment or conductors energized with potentially fatal voltage, never to be touched (directly or indirectly).
- b. An inspection shall be made by a qualified tree worker to determine whether an electrical hazard exists before climbing, otherwise entering, or performing any work in or on a tree.
- c. Only a qualified line-clearance tree trimmer or qualified line-clearance tree trimmer trainee (under the direct supervision of qualified personnel) shall be assigned to the work if it is found that an electrical hazard exists.
- d. There shall be a second qualified line-clearance tree trimmer or line-clearance tree trimmer trainee within normal voice communication during the clearing operations aloft under the following conditions:
 - (1) When the line-clearance tree trimmer or line-clearance tree trimmer trainee must approach any closer than 10 ft (3 m) to any conductor or electrical apparatus energized in excess of 750 volts;

EM 385-1-1
3 Nov 03

(2) When branches or limbs being removed cannot first be cut (with a pole pruner/pole saw) sufficiently clear of the equipment or conductors so as to avoid contact; or

(3) When roping is required to remove branches or limbs from such equipment or conductors.

e. Line-clearance tree trimmers and line-clearance tree trimmer trainees shall maintain the distances from energized conductors as specified in Table 11-1. All other tree workers shall maintain a minimum distance of 10 ft (3 m) from energized conductors rated 50 kV phase-to-phase or less. For conductors rated over 50 kV phase-to-phase, the minimum distance shall be 10 ft + 4/10 in (3 m +/- 1 cm) for each kV over 50 kV.

31.A.03 During all tree working operations above a height of 12 ft (3.6 m) that are not subject to the requirements of 31.A.02d, there shall be a second worker in the vicinity.

31.A.04 Equipment.

a. Equipment shall be inspected, maintained, repaired, and used in accordance with the manufacturer's instructions.

b. Employees shall be instructed in the safe and proper use of all equipment provided to them.

31.A.05 Climbing ropes shall not be used to lower limbs or other parts of trees or to raise or lower equipment.

31.A.06 A handle shall be used for raising and lowering tools.

31.A.07 Tools used for cabling, bark tracing, cavity work, etc., shall be carried in a bag or belt designed to hold tools and not put in the pockets or stuck in the top of a boot.

31.A.08 When placing an employee in a tree with an aerial device, prior to leaving the basket for entry onto the tree, and before

removing the safety line attached to the basket, the employee shall be safely secured to the tree. The procedure shall be reversed when entering the basket from the tree.

31.A.09 See Appendix P for recommended safe tree maintenance and removal practices.

31.B TREE CLIMBING

31.B.01 Equipment.

- a. Climber spurs shall be of the tree-climbing type and shall have gaffs of the type and length suitable for the tree being climbed.
- b. Climbing ropes shall have a minimum diameter of 1/2 in (1.2 cm) and be constructed of a synthetic fiber, with a minimum nominal breaking strength of 5400 lb (2439.4 kg) when new. Maximum working elongation (elasticity) shall not exceed 7% at a load of 540 lb (244.9 kg) (10% maximum breaking strength).
- c. Polypropylene or other synthetic ropes having similar low melting points shall not be used as climbing ropes.

31.B.02 A tree worker shall be tied in with an approved type of climbing rope and safety saddle when working above the ground: this does not necessarily apply to a worker ascending into a tree; work may be performed while standing on a self-supporting ladder but only when the worker is tied in as required.

31.B.03 During climbing operations, tree limbs should be inspected before weight is applied to them.

31.B.04 A 5/8 in (1.5 cm) metal shackle shall be secured to the end of a support line that meets minimum standards for a climbing line. The support line shall be tied to the pin of the shackle with the climbing line placed through the shackle. The support line shall be tied off at the base of the tree or any other acceptable anchor.

EM 385-1-1
3 Nov 03

31.B.05 The climbing line shall be crocheted as soon as practicable after the employee is aloft, and a taut-line hitch tied and checked.

31.B.06 The worker shall be completely secured with the climbing line before starting the operation. The worker shall remain tied in until the work is completed and he/she has returned to the ground. If it is necessary to recrochet the rope in the tree, the worker shall re-tie in or use the safety strap before releasing the previous tie.

31.B.07 Tree workers shall not carry tools in their hands while climbing. Tools shall be raised and lowered one at a time by means of a line, except when working from an aerial-lift device or during topping or removing operations.

31.C FELLING

31.C.01 Prior to felling operations, the employee shall consider:

- a. The tree and the surrounding area for anything that may cause trouble when the tree falls;
- b. The shape of the tree, the lean of the tree, and decayed or weak spots;
- c. Wind force and direction;
- d. The location of other people; and
- e. Electrical hazards.

31.C.02 Prior to felling operations, the work area shall be cleared to permit safe working conditions and an escape route shall be planned.

31.C.03 Each worker shall be instructed as to exactly what he/she is to do. All workers not directly involved in the operation shall be kept clear of the work area.

31.C.04 Before starting to cut, the operator shall be sure of his/her footing and must clear away brush, fallen trees, and other materials that might interfere with cutting operations.

31.C.05 A notch and backcut shall be used in felling trees over 5 in (12.7 cm) in diameter (measured at breast height). No tree shall be felled by "slicing" or "ripping" cuts.

- a. The depth or penetration of the notch shall be about one-third the diameter of the tree.
- b. The opening or height of the notch shall be about 2.5 in (6.3 cm) for each 1 ft (0.3 m) of the tree's diameter.
- c. The backcut shall be made higher (approximately 2 in (5 cm)) than the base of the notch to prevent kickback.

31.C.06 The employee shall work from the uphill side whenever possible.

31.C.07 Just before the tree or limb is ready to fall, an audible warning shall be given to all those in the area. All persons shall be safely out of range when the tree falls.

31.C.08 If there is danger that the trees being felled may fall in the wrong direction or damage property, wedges, block and tackle, rope, or wire cable (except when an electrical hazard exists) shall be used. All limbs shall be removed from trees to a height and width sufficient to allow the tree to fall clear of any wires and other objects in the vicinity.

31.C.09 Special precautions shall be taken when roping rotten or split trees due to the potential for falling in an unexpected direction even though the cut is made on the proper side.

31.C.10 Persons shall be kept back from the butt of a tree that is starting to fall.

EM 385-1-1
3 Nov 03

31.D BRUSH REMOVAL AND CHIPPING

31.D.01 Brush and logs shall not be allowed to create a hazard at the work site.

31.D.02 Employees working with a brush chipper shall be trained in its safe operation. The chipper shall be operated in accordance with the manufacturer's recommendations.

31.D.03 Brush chippers.

a. Rotary drum and disk-type tree or brush chippers not equipped with a mechanical in-feed system shall be equipped with an in-feed hopper not less than 85 in (215.9 cm) (the sum of the horizontal distance from the chipper blade out along the center of the chute to the end of the chute and the vertical distance from the chute down to the ground) and shall have sufficient height on its side members to prevent personnel from contacting the blades or knives of the machine during normal operations.

b. Rotary drum and disk-type tree or brush chippers not equipped with a mechanical in-feed system shall have a flexible anti-kickback device installed in the in-feed hopper for the purpose of protecting the operator and other persons in the machine area from the hazards of flying chips and debris.

c. Disk-type tree or brush chippers equipped with a mechanical in-feed system shall have a quick stop and reversing device on the in-feed. The activating mechanism for the quick stop and reversing device shall be located across from the top, along each side of, and as close as possible to the feed end of the in-feed hopper and within easy reach of the operator.

d. The feed chute or feed table of a chipper shall have sufficient height on its side members to prevent operator contact with the blades or knives during normal operation.

e. A swinging baffle shall be mounted in front of the knives to prevent throwback of material.

f. Brush chippers shall be equipped with an exhaust chute of sufficient length or design to prevent contact with the blade.

g. Brush chippers shall be equipped with a locking device on the ignition system to prevent unauthorized starting of the equipment.

h. Brush chipper cutting bars and blades shall be kept sharp, properly adjusted, and otherwise maintained in accordance with the manufacturer's recommendations.

31.D.04 Trailer brush chippers detached from trucks shall be chocked or otherwise secured.

31.D.05 All workers feeding brush into chippers shall wear eye protectors. Loose clothing, gauntlet-type gloves, rings, and watches shall not be worn by workers feeding the chipper.

31.D.06 Employees shall never place hands, arms, feet, legs, or any other part of the body on the feed table when the chipper is in operation or the rotor is turning. Push sticks (of material that can be consumed by brush chipper) shall be used.

31.D.07 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. Chippers shall be fed from the curbside whenever possible.

31.D.08 Material such as stones, nails, sweepings, etc. shall not be fed into brush chippers.

31.D.09 The brush chipper chute shall not be raised while the rotor is turning.

EM 385-1-1
3 Nov 03

31.E OTHER OPERATIONS AND EQUIPMENT

31.E.01 Pruning and trimming.

- a. Pole pruners, pole saws, and similar tools shall be equipped with wood or nonmetallic poles. Actuating cords shall be of a nonconducting material.
- b. Pole pruners and pole saws shall be hung securely in a vertical position with the sharp edges away from employees. They shall not be hung on utility wires or cables or left overnight in trees.
- c. When necessary, warning shall be given by the worker in the tree before a limb is dropped.

31.E.02 Limbing and bucking.

- a. Whenever it is possible to do so, the tree worker shall work on the side on which the limb is being cut.
- b. Branches bent under tension shall be considered hazardous.
- c. When topping or lowering limbs, consideration shall be given to the use of taglines to control the limbs. A separate line shall be attached to limbs that 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.
- d. In bucking, tree workers shall stand on the uphill side of the work whenever possible. The tree worker shall block the log to prevent rolling when necessary.
- e. When bucking, wedges shall be used as necessary to prevent binding of the guide bar or chain.

31.E.03 Stump cutters shall be equipped with enclosures or guards that effectively protect the operator.

31.E.04 Trucks.

- a. A steel bulkhead or equivalent protection shall be provided to protect the occupants of vehicles from load shifts.
- b. Logs or brush shall be securely loaded onto trucks in such a manner as not to obscure taillights or brake lights and vision, or to overhang the side.
- c. In order to avoid the hazard of spontaneous combustion or the production of undesirable products, wood chips shall not be left in trucks for extended periods.

31.E.05 Power saws.

- a. Power saws weighing more than 15 lb (6.8 kg) that are used in trees shall be supported by a separate line, except when used from an aerial lift device.
- b. Where there are no lateral branches on which to crotch a separate support line for power saws weighing more than 15 lb (6.8 kg), a false crotch shall be used.
- c. The engine shall be started and operated only when all co-workers are clear of the saw.
- d. The operator will shut off the saw when carrying it over slippery surfaces, through heavy brush, and when adjacent to personnel. The saw may be carried running (idle speed) for a short distances (less than 50 ft (15.2 m)) as long as it is carried to prevent contact with the chain or muffler.

31.E.06 Chopping tools.

- a. Chopping tools that have loose or cracked heads or splintered handles shall not be used.
- b. Chopping tools shall never be used while working aloft.

EM 385-1-1

3 Nov 03

c. Chopping tools shall be swung away from the feet, legs, and body, using the minimum power practical for control.

d. Chopping tools shall not be driven as wedges or used to drive metal wedges.

31.E.07 Cant hooks, cant dogs, tongs, and carrying bars.

a. Hooks shall be firmly set before applying pressure.

b. Workers shall be warned and shall be in the clear before logs are moved.

c. The points of hooks shall be at least 2 in (5 cm) long and shall be kept sharp.

d. Workers shall stand to the rear and uphill when rolling logs.

31.E.08 Wedges and chisels.

a. Wedges and chisels shall be properly pointed and tempered.

b. Only wood, plastic, or soft metal wedges shall be used with power saws.

c. Wood-handled chisels should be protected with a ferrule on the striking end.