

Safe Work Practices

ISA Certified Arborist Exam
Study Session



Table of Contents

- ▶ Laws and Regulations
- ▶ Work Site Safety
Hazards/Actions to be Taken
- ▶ Rescue Procedures
- ▶ Climbing/Equipment/Technical
- ▶ Behavior





**CAUTION
MEN AT WORK**

▶ <https://youtu.be/oBo-SVsH898>

Recognizing Industry Standards

- ▶ OSHA (Occupational Safety and Health Administration)- **We must comply with all regulations**
- ▶ ANSI (American National Standards Institute)
- ▶ ANSI Z133.1 safety standards
- ▶ ANSI A300 for tree care
- ▶ Shall vs. Should

The break down

- ▶ Proper training
- ▶ Morning meeting
- ▶ Equipment inspection
- ▶ Site inspection
- ▶ Job Briefing
- ▶ PPE
- ▶ Command and response system

JOB BRIEFING

- ▶ DOCUMENTED!
- ▶ ANSI 3.4.3 “A job briefing SHALL be performed by the qualified arborist in charge before the start of each job. The briefing shall be communicated to all affected workers. An employee working alone need not to conduct a briefing. However, the employer SHALL ensure that the tasks are being performed as if a briefing were required.



Work site safety hazards and appropriate action:

- ▶ Hazard recognition - examples?

The safety standard in the US
for tree work is ???

A. ANSI Z133

B. ANSI 60.1

C. OSHA 133

Inspect equipment

- ▶ ANSI 3.1.1 “ Tools and equipment SHALL conform to the requirements of this standard”
- ▶ 3.1.2 “ Employers SHALL instruct their employees in proper use, inspection, and maintenance of tools and equipment, including ropes and lines, and SHALL require that appropriate working practices are followed.
- ▶ Pre-trip and Pre-use inspection



Topography, the tree, other..

- ▶ ANSI 5.2.2 “Before aerial device is set up, the worksite shall be surveyed for:
 1. Insufficient supporting surfaces
 2. Ditches
 3. Excessive slopes
 4. Debris
 5. Overhead obstructions
 6. Weather conditions
 7. Presence of unauthorized persons
 8. Road and worksite traffic
 9. Subsurface chambers such as underground utilities

Electrical Hazards:

Certified by employer

Qualified and trained in aerial rescue procedures

Electrical conductor (any line to be considered energized)

Direct vs. indirect contact

Use of insulated tools



MINIMUM APPROACH

- ▶ 10' for not qualified
- ▶ 2'9" for incidental qualified
- ▶ Dependent upon elevation

All communication wires and cables should be considered de-energized, they cannot carry electrical current

▶ True or False?

Traffic Control

- ▶ Use cones
- ▶ Work ahead signs
- ▶ High Visibility vests
- ▶ Flashers/beacons
- ▶ Be DEFENSIVE



First Aid

- When in doubt call **911**,
know where you are.
- If electrical hazards are involved you are helpless, call **911**
- Do not move victim unless necessary
- Shock
- CPR/AED get trained
- Bleeding, burns, head injuries, heat stroke, bites, poisonous plants

A condition that often follows accidents in which a victim has a weak and rapid pulse, shallow breathing and cool clammy skin is??

A. Hypothermia

B. Heat Stroke

C. Shock

PPE

- Appropriate clothing and footwear
- Head protection ANSI Z89.1 (different classes)
- Eyes, ANSI Z87.1 safety glasses or face shield
- Harness, inspection, proper fit.
- Gloves required in some operations (i.e. chemical)
- Boots
- Chaps or Chainsaw pants

An arborist is going to remove a tree that is within 5 feet of an energized conductor, what class hard hat is needed?

- A) Class C
- B) Class D
- C) Class E

Chain Saw Safety

ANSI 6.3.6 “ A chain saw shall be operated with the left hand and thumb gripped firmly around the forward handle and the right hand and thumb gripped firmly around the rear handle unless it is not practicable and the employer demonstrates that a greater hazard is posed by operating the chain saw that way in that particular situation”

- Ranked one of the most dangerous pieces of equipment







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ANSI 6.3.4

- ▶ DROP STARTING A CHAIN SAW IS PROHIBITED. A CHAIN SAW SHALL BE STARTED WITH THE CHAIN BRAKE ENGAGED AND THE OPERATOR HOLDING THE SAW FIRMLY IN A MANNER THAT MINIMIZES MOVEMENT OF THE SAW WHEN PULLING THE STARTER HANDLE

- Reactive forces
- Kickback
- Avoid over shoulder height
- Keep close to body
- Only experienced training for “in tree” use
- More than 15 lbs., need separate line

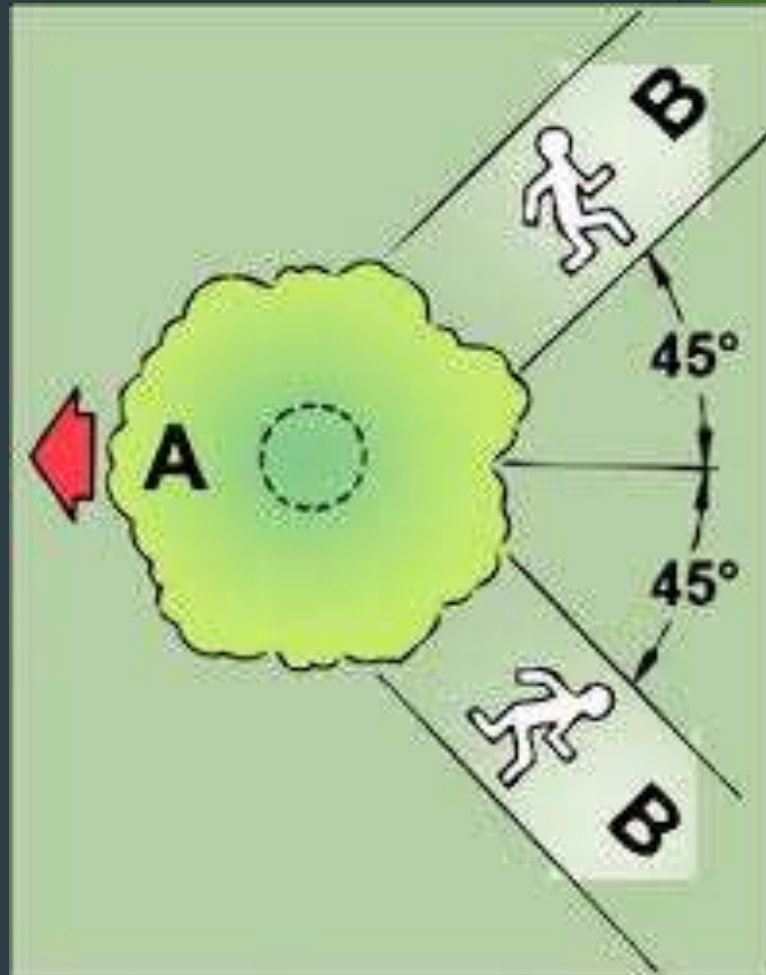
The chain brake must be engaged if the operator takes one hand off the saw or takes more than 2 steps

True or False?

Felling and Removals

ANSI 8.5.1 Before beginning any tree removal operation, the chain saw operator, equipment operator, and or crew leader SHALL carefully consider relevant forces pertaining to the tree and site and SHALL take appropriate actions to ensure a safe removal operation

- ▶ Thoroughly inspect equipment, tree, site
- ▶ Job briefing
- ▶ Know your escape route
- ▶ Use a rope and wedges



Felling and Removals

8.5.13.3 “Notches shall be 45 degrees or greater and large enough to guide the fall of the tree or trunk”

- ▶ Open Face - 70 degrees
- ▶ Traditional- 45 degrees
- ▶ Humboldt- Upside 45

The types of three undercuts.



Conventional



Humboldt



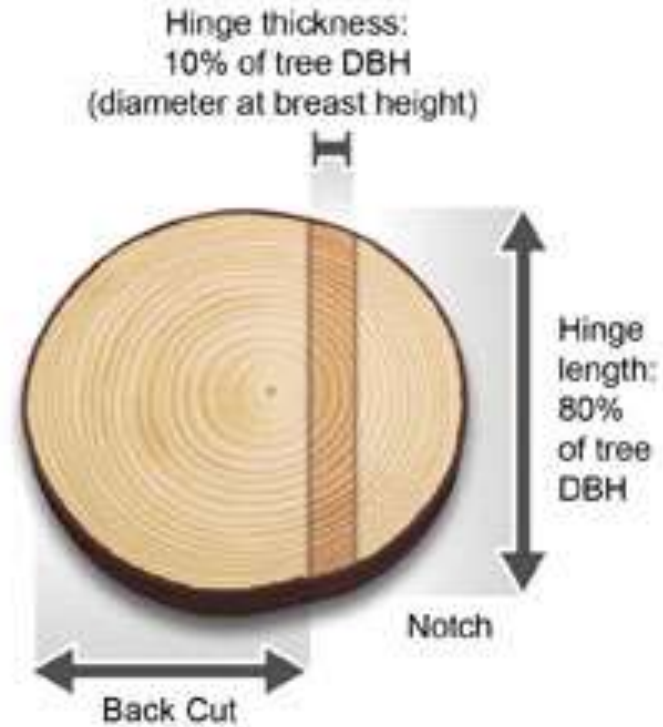
Open Face

What are the benefits of an open face notch?

- A. It makes the hinge break faster
- B. Allows you to pull a tree in a different direction
- C. Controls the tree all the way to the ground

Proper cutting

- ▶ Face cut
- ▶ Hinge
- ▶ Back cut



(below - felling notch and cut. Arbormaster Training)



Chipper Safety

8.6.5 Only persons trained in safe chipper operation may operate chippers. Training SHALL include, but is not limited to, inspection, starting, stopping, feeding, and shutdown. Training SHALL be provided for each type of chipper being used.

- ▶ Very Dangerous
- ▶ All warnings labels in place
- ▶ Loose clothing, jewelry, climbing saddles, harnesses, chaps, gauntlet style gloves **MUST NOT BE WORN**
- ▶ Machine must be off when working on it



Climbing

8.1.1 A visual hazard assessment, including a root collar inspection, SHALL be performed prior to climbing , entering, or performing any work in a tree.

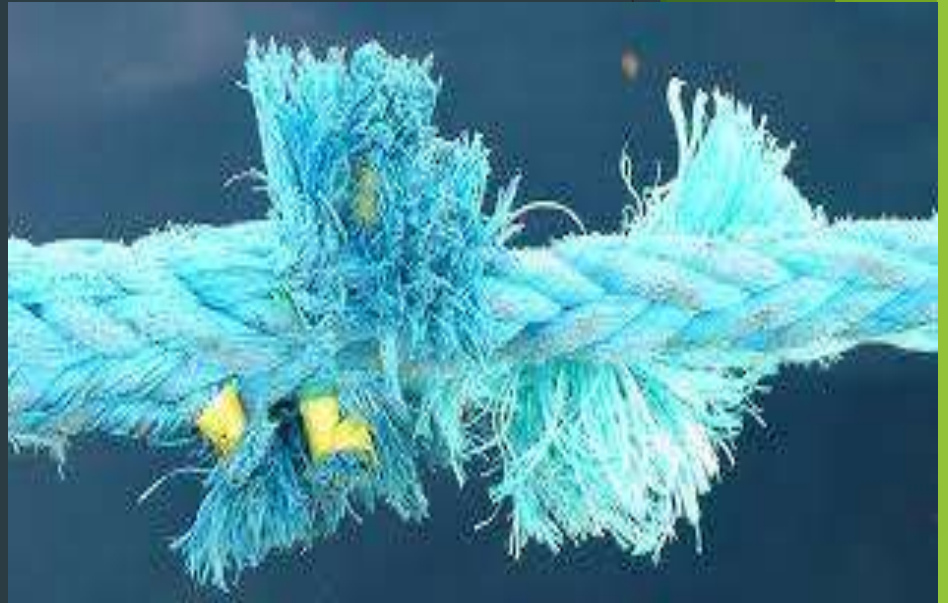
- Very physical and potentially hazardous
- Inspect equipment
- Inspect tree for hazards



CLIMBING

Inspection of gear

- PPE
- Saddle
- Snaps/Carabiners
(minimum tensile strength of 5,000 lbs)
- Climbing line
(minimum tensile strength of 5,400 lbs)
- Lanyards



Design and limitation

8.4.1 Arborists performing rigging operations SHALL inspect trees for their integrity to determine whether the trees have any visible defects that could affect the operation. If it is determined that the tree poses a risk of failure due to the forces and strains that will be created by the design of the rigging operation, an alternate plan SHALL be used.

- ▶ Know the proper use of equipment (blocks, pulleys, etc.)
- ▶ Each use puts on wear
- ▶ Load limits - cycles to failure
- ▶ $WLL - \text{Working Load Limit} = \text{tensile strength} / \text{design factor}$
- ▶ $\text{Design factor} = \text{tensile strength} / WLL$



If a rope has the tensile strength of 5,000lbs and a working load limit of 1,000lbs, what is the maximum amount of weight you can put into the rope when removing a tree.

- A. 5000 lbs
- B. 1,000 lbs
- C. 500 lbs

What is the design factor?

Knots (General term for all)

- ▶ Tie
- ▶ Dress (alignment of the parts)
- ▶ Set (tighten knot in place)
- ▶ Hitch; secure rope to object or other rope
- ▶ Bend; joins 2 ropes together

Climbing techniques and procedures

A climbing line SHALL be a minimum diameter of ½” and have a minimum tensile strength of 5,400 lbs.

- ▶ Entering the tree
- ▶ spurs
- ▶ Throw line
- ▶ body thrust
- ▶ foot lock)



Tying In

- ▶ High, central location
4 inches or greater
- ▶ Wide anchor point that minimizes swing; main lead
- ▶ False tie in; minimizes rope wear



Use of climbing line and work positioning

- ▶ More than a safety device.
- ▶ Use to ascend, access branch tips, maintain balance, move freely.
- ▶ Keep weight on line, both hands free for working
- ▶ 3 point contact always; line is 1

Rigging

▶ 8.5.1

- ▶ ARBORISTS PERFORMING RIGGING OPERATIONS SHALL INSPECT TREES FOR THEIR INTEGRITY TO DETERMINE WHETHER THE TREES HAVE ANY VISIBLE DEFECT THAT COULD AFFECT THE OPERATION. IF IT IS DETERMINED THAT THE TREES POESE A RISK OF FAILURE DUE TO THE FORCES AND STRAINS THAT WILL BE CREATED BY THE DESIGN OF THE RIGGING OPERATION, AN ALTERNATE PLAN SHALL BE USED.



- ▶ Safety Factor: 10:1 or 5:1
- ▶ Tensile Strength/Working Load Limit
- ▶ Usually 5 for rigging equipment and 10 for ropes
- ▶ If tensile strength is 20,000lbs then the WLL is 4,000lb with a design factor of 5

Quiz



1. The acronym PPE stands for
 - a. Proper Protection Equipment
 - b. Protective Property and Ergonomics
 - c. Passive Protection Education
 - d. Personal Protective Equipment

2. If you watched some YouTube videos and you think you tied your climbing hitch correctly, you are good to go?
 - a. True
 - b. False

3. Safety is an

a. Attitude

b. Accessory

c. Inconvenience

4. Carabineers used in climbing must be loaded
 - a. across the major axis
 - b. in line with (parallel to) the major axis
 - c. with double-strength rope
 - d. with double loops of climbing line for increased strength

5. The design factor, or safety factor, of a rope
 - a. is the tensile strength divided by the working load limit
 - b. is the working load limit divided by the tensile strength
 - c. should be kept between 5 and 9
 - d. is an aspect of safety that is required by law to be within certain tolerances

- ▶ 6. The kickback point on a chainsaw is?
 - a. The bottom of the bar
 - b. The top half of the tip of the bar
 - c. The 3rd tooth from the end of the chain
 - d. The bottom quadrant of tip of the bar

7. Controlling a load when lowering branches out of a tree
 - a. is done by applying friction
 - b. can involve the use of a port-a-wrap
 - c. may be accomplished by wrapping a lowering line around the base of a tree
 - d. all of the above

8. Equipment that is sent from the ground to the climber is often tied to the climbing line using

- a. bowline
- b. sheet bend
- c. clove hitch
- d. figure-8 knot

9. The first step in assessing an emergency situation is
 - a. checking the victim's pulse and breathing
 - b. immediately returning climbers to the ground
 - c. shutting down all power equipment
 - d. determining if an electrical hazard exists

10. The only time it is acceptable to not wear chaps when operating a chainsaw is?

- a. When cutting branches 4" diameter or less
- b. When working in a bucket truck
- c. When you are not operating the chainsaw above 3500 RPM

11. Before ascending a tree, the climber should check
 - a. for hazards such as broken limbs or cracks
 - b. for electrical hazards
 - c. the root crown for symptoms of decay
 - d. for conks or other signs of decay
 - e. all of the above

13. A rescue kit

- a. should not be used for everyday work
- b. should include a climbing line and saddle
- c. should include spurs, a lanyard and a throwline
- d. all of the above

14. According to ANSI Z133.1 standards, the term *approved* denotes

- a. acceptable to federal, state or local enforcing authority having jurisdiction
- b. a mandatory requirement
- c. a safety suggestion by the NAA
- d. none of the above

16.

When felling a tree, the _____ provides an unbroken hinge all the way to ground level.

- a. conventional (standard 45°) notch
- b. Humboldt notch
- c. open-faced notch
- d. Controller notch
- e. none of the above

18.

According to ANSI Z133.1 standards, the term *should* denotes

- a. acceptable to federal, state or local enforcing authority having jurisdiction
- b. a mandatory requirement
- c. a safety suggestion by the NAA
- d. an advisory recommendation

19.

The communication arrangement between tree climbers and ground personnel is called

- a. call and reply system
- b. command and response system
- c. call and echo system
- d. director and directions system

20. Proper refueling requirements do not include

- a. moving at least 10 feet away from the refueling site before restarting the equipment
- b. using only approved safety containers for flammable liquids
- c. smoking while refueling equipment
- d. completely stopping equipment engines before refueling
- e. none of the above

21. A good rule-of-thumb for hinge thickness is that the hinge should be _____% of the tree's diameter.

- a. 10
- b. 20
- c. 50
- d. 70
- e. 80

22. A *direct contact* is made when

- a. an employee and a customer shake hands on a job, without signing a contract
- b. any part of the body touches any conductive object in contact with an energized conductor
- c. an employee and customer negotiate a contract via e-mail, without ever meeting each other
- d. any part of the body contacts an energized conductor or other energized electrical fixture or apparatus

23. Steel-toed boots are not required when using a chainsaw.

- a. True
- b. False

24. Leaning trees are especially dangerous to fell because they can split before falling, causing a _____.

- a. barber chair
- b. longitudinal axis
- c. split seam
- d. drop crotch
- e. Humboldt notch

25. Indirect contact can be made through

- a. tree branches
- b. conductive tools
- c. trucks
- d. equipment
- e. all of the above

Thank You

Good luck on the exam!

Questions or review?