

Tree Maintenance and Removal

Short description

This section outlines the guidance for assessing and controlling hazards associated with tree maintenance and removal.

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1 Objective and area of application

The objective of this section of the HSEQ Manual seeks to inform Centennial employees and subcontractors of their obligations to develop the appropriate hazard prevention and control methodologies designed to prevent workplace injuries, illnesses and property damage occurring from tree maintenance and removal activities.

All personnel who may be involved in tree maintenance and removal activities on Centennial project sites shall be able to recognize the hazards associated with the different types of equipment and the safety precautions necessary to prevent incidents and injuries.

Any piece of tree maintenance and removal equipment that is not in compliance with any applicable requirement of this section is prohibited and shall either be identified as unsafe by tagging or locking the controls to render them inoperable or shall be physically removed from the project site.

2 Superior and additional applicable documents

1000_GD_11_01_en_1.2 Group Principle on HSEQ

1000_GP_11_01_en_7.0 Group Policy on Health, Safety, Environment and Quality (HSEQ)

1000_SOP_11_01_en_2.0 SOP on HSEQ Management

1000_SOP_11_03_en_1.0 SOP on Leadership & Workers Involvement

1000_SOP_11_04_en_1.0 SOP on Health & Safety Standards of Work

1000_SOP_11_05_en_1.0 SOP on HSEQ Incidents & Accounting Rules

1000_SOP_11_06_en_1.0 SOP on Administration and use of the HSEQ management software ACTIVE

EM 385-1-1 (2014), Chapter 31

ANSI Z133- American National Standard for Arboricultural Operations- Safety Requirements

This section of the HSEQ Manual applies to all Centennial employees and subcontractors who are performing work in Centennial facilities and / or on project sites. There may be more stringent requirements than this section as defined by specific State, local or contact specific HSEQ requirements. If there is a conflict between this section and other applicable regulations, the more stringent will apply.

3 Definitions

The following definitions of terms are important for an understanding of this procedure.

Term	Definition
AHA	Activity Hazard Analysis
Bucking	The process of cutting a felled tree into logs
Centennial	All Centennial employees, joint venture employees, subcontractors and business partners
Chipping	The process of reducing wood (generally tree limbs or trunks) into smaller wood chips
Crotch	The angle formed by the spreading apart of two tree branches or of a limb from its trunk
Felling	The process of downing individual trees, an element of the task of logging
HSEQ Director	Leads the HSEQ Team
Limbing	The process of removing branches from the stem of a tree
Pruning	The practice of the selective removal of parts of a tree such as branches, buds or roots
Topping	The practice of removing whole tree tops or large branches and/or trunks from the tops of trees
Qualified tree worker	an individual who, through related training and on-the-job experience, is familiar with equipment, techniques, and hazards of tree maintenance and removal and has demonstrated ability in the performance of the special techniques involved

4 General requirements for tree maintenance and removal

Tree maintenance and removal work includes trimming, pruning, felling and removal of trees and bushes. Incidents related to tree work can result in severe traumatic injuries and deaths. Commonly reported Incidents include falls, electrocutions, and those caused by falling objects. Most Incidents can be prevented by recognizing and controlling hazards in advance as well as training employees and subcontractors on safe work practices and effective use of personal protective equipment

Tree maintenance and removal work may involve the following potentially hazardous operations:

- Climbing trees
- Using portable ladders
- Mobile Elevated Work Platforms (MEWP)
- Using hand and portable power tools
- Working near energized electrical systems or conductors
- Feeding chippers

The following are the general requirements for tree maintenance and removal operations on Centennial project sites:

- All tree maintenance or removal activities shall be under the supervision of a qualified tree worker

- Tree maintenance and removal activities shall be supervised by a competent and/or qualified tree worker. The services of other licensed professionals may be required depending on the scope of activity or by contract requirements.
- Electrical hazards shall be evaluated by the competent and/or qualified tree worker prior to climbing or performing any work in or on an tree
- If electrical lines or equipment cannot be avoided, arrangements shall be made with the power company or owner to mitigate the electrical hazard. Mitigation options could include de-energizing, testing, isolating and grounding of electrical conductors
- In accordance with 29 CFR 1910.269, only qualified line-clearance tree trimmers shall be permitted to work in close proximity to electrical hazards. A second qualified line-clearance tree trimmer shall be present within voice range for communication under the following conditions:
 - o The work is closer than 10 feet to any conductor or electrical apparatus in excess of 750 volts
 - o When branches or limbs being removed cannot first be cut (with a pole pruner/pole saw) sufficiently clear of equipment or conductors to avoid contact
 - o When roping is required to remove branches or limbs from such equipment or conductors

5 Tree climbing

When tree climbing is performed, whether there are electrical hazards or not, a second worker shall be required in the area. The second worker shall also be a qualified climber, capable and knowledgeable of rescue techniques, including self-rescue.

The climber shall inspect the tree and surrounding area for hazards and perform a risk assessment of the tree and work site. Some issues to be considered are: power lines, tree hangers or broken and dead branches, entanglement with adjacent or downed trees, shape and lean of the tree, tree damage from wind, lightning, disease, location of septic lines and tanks and other potential at-grade or below-grade utilities that could be impacted.

The following apply to tree climbing and include but are not limited to:

- Debris and other objects shall be removed from beneath the climber whenever possible
- Weather conditions shall be assessed as well as the location of adjacent structures (adverse weather conditions include lightning and thundestorms in the area)
- Where climbing is required, tree crews shall have a secondary climber who could assist in a rescue if necessary OR the crew shall be working in proximity to nearby crews with a climber who could assist in a rescue
- A climber shall have a climbing line and at least one other means of being secured on their person at all times (e.g. climbing line and a work positioning lanyard etc.)
- The climber shall be tied in with an approved type of climbing line and safety saddle while ascending the tree, including when using climbing spurs/gaffs
- The climber shall be tied in once the work begins and shall remain tied in until the work is completed and they have returned to the ground
- The climber shall be secured when repositioning the climbing line
- Work may be performed while standing on a ladder only when the worker is tied in or otherwise secured as stated above

- The climbing line shall be passed around the trunk of the tree as high above the ground as possible using branches with a wide crotch to prevent any binding of the safety line
- The climbing line shall be passed around the main leader or an upright branch, using the limb as a stop
- The climber shall tie a stopper knot (e.g., figure-eight knot) in the end of the line, particularly when the climber will be working at heights greater than half the length of the climbing line, to prevent pulling the climbing line accidentally through the climbing hitch and possibly falling
- Climbers shall not carry tools in their hands while climbing. Tools (including chain saws) shall be raised and lowered one at a time by means of a line
- Chainsaws used aloft shall be secured against falling
- Climbing of dead and dying trees shall only be performed where no other safe and feasible alternative exists for removal of the tree
- Gaff lengths shall be suitable for the tree being climbed
- Climbers shall not ascend above their tie point
- Once in the tree, climbers shall be tied off at two points while working or using the chainsaw
- Climbers shall disconnect from the access line only when a new tie point has been established
- Tree climbers shall be medically cleared by a licensed healthcare provided for tree climbing

6 Tree felling

A Tree Felling-Maintenance Plan (Appendix 1) shall be submitted and approved by the PSO and Superintendent whenever subcontractors are required to fell a tree(s).

Prior to felling operations, the work area shall be cleared to permit safe working conditions and an escape route shall be planned. Workers shall ensure that homes and structures are evacuated where trimming and felling operations are in close proximity.

Felling paths shall be at least twice the distance as the height of the tree (due to limbs and debris being thrown after hitting the ground). Where this distance cannot be maintained, limbing may be required. Power lines may also need to be dropped or de-energized. Before starting to cut, the chainsaw operator shall be sure of his footing and must clear away brush, fallen trees, and other materials that might interfere with cutting operations.

A notch and back cut 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.

The chainsaw operator shall work from the uphill side whenever possible. Tag lines may be used to help guide the direction of the fall provided the workers on the tag line are well clear of the fall path, such as twice the distance of the fall area.

The following shall be considered prior to commencing in any tree felling operations:

- Tree size
- Selected direction of fall
- Felling path obstacles
- Vines or interlocking limbs
- Species and shape of tree

- Lean of tree
- Loose limbs, hangers, broken tops, chunks or other overhead material
- Wind force and direction
- Decay, cavities or weak spots throughout the tree
- Location of electrical conductors or other electrical equipment
- Tree cables, bracing, lightning protection or other tree hardware
- Size, terrain characteristics or other limitations of the work area
- Potential for flying debris from tree impact
- Adequate retreat path
- Evidence of bees or wildlife habitation in the tree
- Poisonous plants
- Ability to control access to project site
- Root mass stability
- Ice or snow load
- Throw back or bounce back potential
- Lightning damage

7 Brush removal and chipping

The following are the general requirements for brush removal and chipping operations on Centennial project sites:

- Personnel working with a brush chipper shall be trained in its safe operation
- The chipper shall be operated in accordance with the manufacturer's recommendations
- 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
- Brush chippers shall be equipped with a discharge chute of sufficient length or design to prevent contact with the blade
- Brush chipper cutting bars and blades shall be kept sharp, properly adjusted, and otherwise maintained in accordance with the manufacturer's recommendations
- All workers feeding brush into chippers shall wear eye protection
- Loose clothing, gauntlet-type gloves, rings, and watches shall not be worn by workers feeding the chipper
- Personnel 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) or long branches shall be used to feed shorter material into the chipper
- Material such as stones, nails, sweepings, etc. shall not be fed into brush chippers
- The brush chipper discharge chute or cutter housing cover shall not be raised or removed while any part of the chipper is turning or moving

8 Other operations and equipment

8.1 Pruning and trimming

The following are the general requirements for pruning and trimming operations on Centennial project sites:

- Pole pruners, pole saws, and similar tools shall be equipped with wood or non-metallic poles. Actuating cords shall be of a non-conducting material
- When necessary, warning shall be given by the worker in the tree before a limb is dropped
- A scabbard or sheath shall be hooked to the climbing belt to carry a handsaw when not in use
- A separate lowering/rigging line shall be attached to limbs that cannot be dropped safely or are too heavy to be controlled by hand

8.2 Limbing and bucking

The following are the general requirements for limbing and bucking operations on Centennial project sites:

- Chainsaw cut-resistant leg protection shall be worn by the chainsaw operator for all chainsaw operations on the ground
- When more than one worker is limbing or bucking a tree, each shall be positioned and their duties organized so that the actions of one worker will not create a hazard for any other worker
- Chainsaws should be operated away from the vicinity of the legs and feet. Natural barriers, such as limbs between the saw and the body, should be employed where possible, while ensuring proper balance. While operating a chainsaw, the preferred working position is on the uphill side of the work
- Personnel shall make sure of firm footing before and during limbing and bucking. The worker(s) shall not stand on loose chunks or logs that will roll when the cut is complete
- When bucking, wedges shall be used as necessary to prevent binding of the guide bar or chain

8.3 Stump removal

The following are the general requirements for stump removal operations on Centennial project sites:

- Stump cutters shall be equipped with enclosures or guards that effectively protect the operator
- When flush cutting stumps with a chainsaw, all persons assisting the chainsaw operator shall wear the same level of PPE that is required of the chainsaw operator

8.4 Topping and lowering limbs

The following are the general requirements for topping and lowering limbs on Centennial project sites:

- Workers performing topping operations shall ensure the trees can stand the strain of topping procedures; if not, some other means of lowering the branches shall be used
- If large limbs are lowered in sections, the worker in the tree shall be above the limb being lowered

8.5 Power saws

The following are the general requirements for power saws on Centennial project sites:

- When used by a climber aloft, chainsaws weighing more than 15 pounds shall be supported by a separate line crotched in the tree. Where there are no lateral branches on which to crotch a separate support line, a false crotch shall be used
- The engine shall be started and operated only when all co-workers are clear of the saw and then in accordance with the manufacturer's recommendations and instructions
- The engine shall be started and operated only when all co-workers are clear of the saw and then in accordance with the manufacturer's recommendations and instructions
- 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 with the brake set) for short distances (less than 50 feet) as long as it is carried to prevent contact with the chain or muffler
- All saws shall be equipped with a clutch, chain brake (gas only), throttle trigger latch, stop switch, rear hand guard, chain catcher, vibration damper, spark arrestor, and muffler
- Chainsaw chains shall be kept sharp and properly adjusted
- Additional PPE for chainsaw use includes chaps, safety boots, and hearing protection

9 Training

Each Centennial employee, subcontractor or lower tier contractor performing tree maintenance and removal activities shall be trained in the following minimum procedures:

- Task specific hazards associated with tree maintenance and removal (including electrical hazards)
- Safe work procedures and techniques for performing pruning, trimming and felling
- Fall prevention equipment and practices
- Methods for communication
- First aid and CPR
- Work zone safety (when exposed to traffic)
- Tree climbing and rope techniques
- Rescue procedures
- Tool hazard recognition

10 Amendment history

Date	Version	Revised content
12.09.2016	1.0	Initial Preparation
01.01.2018	2.0	Updates to Paragraph 2 Superior Documents to add the Group Policy and Global Standards, Paragraph 3 Definitions (Centennial and HSEQ Director) and Appendix 1 (logo)
07.31.2026	2.1	Updates to Paragraph 2 Superior Documents, Updates to Qualified tree worker definition, Updates to Paragraph 4 to include Mobile Elevated Work Platforms, Updates to paragraph 5 to require a second qualified worker when tree climbing is performed

11 Appendix

Appendix 1: Tree Felling-Maintenance Plan (0206500_CP_11_34_en_A1.1)

Tree Felling/Maintenance Plan

0206500_CP_11_34_en_A1.1



CENTENNIAL

A BILFINGER COMPANY

Instructions: Complete the tree felling plan template below. This plan template should include site specific details regarding tree falling/logging operations/tree maintenance or removal/brush removal & chipping/tree pruning & trimming/limbing & bucking and any other related activities.

Project Title:

Plan Template Author (print name):

Subcontractor (company name):

Date:

Objective

As it pertains to tree maintenance, insert project description below:

Personnel

List the number of individuals in tree maintenance crew:

List name of Qualified Tree Worker (attach credentials to this plan):

If applicable, list the name of the Certified Arborist:

List the names of crew members:

Electrical Hazards

Are overhead electrical lines or other hazards present or in close proximity?

Yes

No

If no, move to next section.....If yes, explain below:

Qualified tree worker will make a visual inspection before climbing or performing any work on tree

Yes

No

If electrical lines are in close proximity to the tree, list below the individual who is the Qualified Line-clearance Tree Trimmer who will work on the tree (attach credentials/proof of training to this plan):

Name:

Contact #:

A second Qualified Line-Clearance Tree Trimmer must be present and be within normal voice communication during clearing operations under the following conditions (check all that apply):

☐ Line-clearance worker must approach closer than 10 feet to any conductor or electrical apparatus energized in excess of 750 Volts

☐ Branches or limbs being removed cannot first be cut sufficiently clear of the equipment or conductors so as to avoid contact

☐ When roping is required to remove branches or limbs from such equipment or conductors

If any of the three conditions listed above are applicable, list the second Qualified Line-Clearance Tree Trimmer:

Name: Contact #

Will an electrically rated bucket/line truck be used during this project?

If yes, please include a copy of the annual test certificate with this plan.

Note: Any workers in a bucket truck or work platform shall use a personal fall restraint system. A full body harness with an incorporated climber's belt shall be worn.

Tree Climbing

Worker(s) will be required to climb tree(s) on this project (if no, please move on to next section):

Name of the Qualified Tree Climber: Age (years):

Name of the Qualified Tree Climber: Age (years):

Name of the Qualified Tree Climber: Age (years):

Note: If any of the above listed tree climbers is over the age of 40, he/she must obtain a medical clearance for heavy exertion work from a licensed physician/health care provider within the past 2 years.

Worker(s) will climb to a height of over 12 feet? List anticipated height:

If climber will climb above 12 feet in height, list below the name of the second worker on site:

(name) is a Qualified Climber and is capable/knowledgeable of rescue techniques including self rescue.

Climber will assess/inspect the tree and the surrounding area for hazards before beginning work?

List/explain the climbing method to be implemented (include detail regarding specific ropes/knots/harnesses) that will be used:

How will tools/saws be carried by the tree worker?

Climbers will use chain saws which are less than 15 lbs:

Will tree climber be using tree spurs to climb? Gaff length:

Tree Felling

Will tree felling take place on this project?

List tree height: Felling path shall be twice the distance as the height of tree

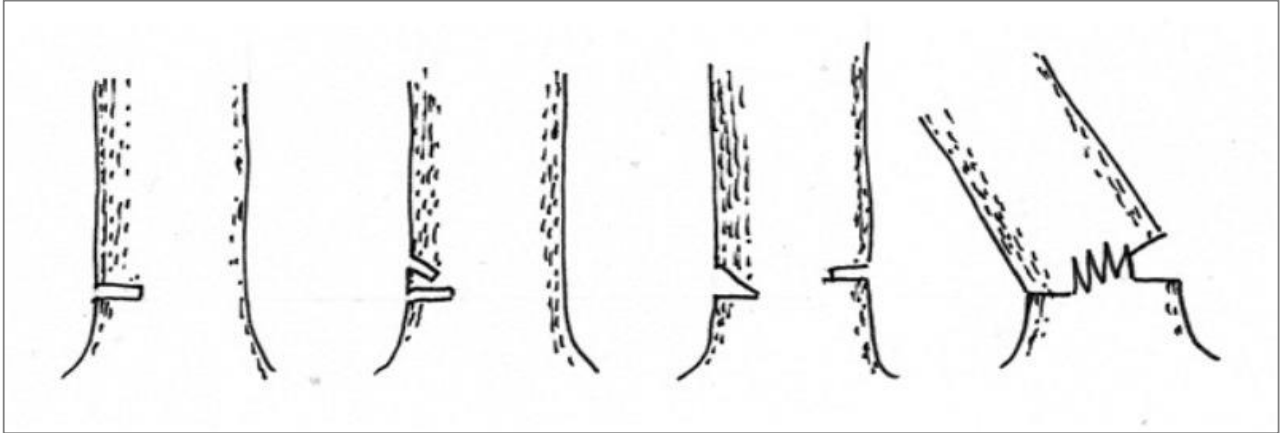
Note: Workers not directly involved in the operation shall be kept clear of the area.

Is the tree(s) over 5 inches in diameter (measured at breast height)?

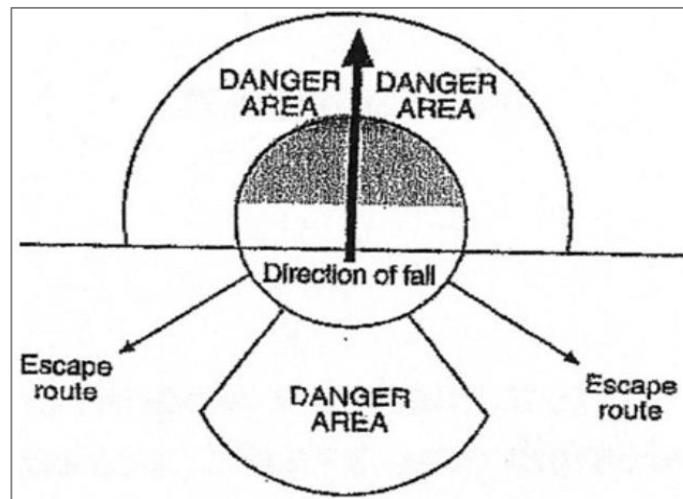
If yes, a notch and backcut shall be used when felling the tree. No tree shall be felled by "slicing" or "ripping" cuts.

Note: See diagram below for example of notch and backcut as well as a diagram for planning the direction of fall.

Step by Step - Notch and Backcut



Planning Direction of Fall



Escape route shall be constantly maintained and kept clear for ease of escape in the event of emergency

Audible warning will be given to workers, just before the tree or limb is ready to fall.

Yes No

Explain in detail how the tree will be felled in the proper/planned direction:

Is there any homes/buildings/structures near the tree?

Yes No

If yes, please explain how these structures will be protected and if they will be evacuated:

If sections of the tree are to be removed, sections shall be limited to 1/3 the distance to the nearest structure.

Miscellaneous

Will brush removal and chipping activities take place on site?

Yes	No
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Will pruning and trimming take place on this site?

Yes	No
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Will pole saws be used on this site?

Yes	No
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Will limbing and bucking be performed on this site?

Yes	No
-----	----

Will cabling be performed on this site?

Yes	No
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Will tree topping be performed on this project?

Yes	No
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Will chopping tools be used on this site?

Yes	No
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List any additional instructions/comments/work procedures:

Reviewed By (print / sign / date):

Competent Person - Print Name

Signature

Date

Superintendent/PSO - Print Name

Signature

Date