American National Standard

for Tree Care Operations —
Tree, Shrub, and Other Woody Plant
Maintenance — Standard Practices
(Transplanting)
American National Standard for Tree Care Operations –

Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices (Transplanting)

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Foreword (This foreword is not part of American National Standard A300 Part 6-2005)

An industry-consensus standard must have the input of the industry that it is intended to affect. The Accredited Standards Committee A300 was approved June 28, 1991. The committee includes representatives from the residential and commercial tree care industry, the utility, municipal, and federal sectors, the landscape and nursery industries, and other interested organizations. Representatives from varied geographic areas with broad knowledge and technical expertise contributed.

The A300 standards are placed in proper context if one reads the Scope, Purpose, and Application. This document presents performance standards for the care and maintenance of trees, shrubs, and other woody plants. It is intended as a guide in the drafting of maintenance specifications for federal, state, municipal, and private authorities including property owners, property managers, and utilities.

The A300 standards stipulate that specifications for tree work should be written and administered by a professional possessing the technical competence to provide for, or supervise, the management of woody landscape plants. Users of this standard must first interpret its wording, then apply their knowledge of growth habits of certain plant species in a given environment. In this manner, the users ultimately develop their own specifications for plant maintenance.

ANSI A300 Part 6 – Transplanting, should be used in conjunction with the rest of the A300 standard when writing specifications for tree care operations.

Suggestions for improvement of this standard should be forwarded to: A300 Secretary, c/o Tree Care Industry Association, 3 Perimeter Road – Unit 1, Manchester, NH 03103, USA or e-mail: tcia@treecareindustry.org

This standard was processed and approved for submittal to ANSI by Accredited Standards Committee on Tree, Shrub, and Other Woody Plant Maintenance Operations – Standard Practices, A300. Committee approval of the standard does not necessarily imply that all committee members voted for its approval. At the time it approved this standard, the A300 committee had the following members:

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Bob Rouse, Secretary  
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American Society of Consulting Arborists ................................................. Tom Mugridge
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Sharon Lilly (Observer)
American National Standard
for Tree Care Operations –

Tree, Shrub, and Other
Woody Plant Maintenance –
Standard Practices
(Transplanting)

Clause 1 excerpted from ANSI A300 (Part 1) – 2001
Pruning

1 ANSI A300 standards

1.1 Scope

ANSI A300 standards present performance standards for the care and maintenance of trees, shrubs, and other woody plants.

1.2 Purpose

ANSI A300 standards are intended as guides for federal, state, municipal, and private authorities including property owners, property managers, and utilities in the drafting of their maintenance specifications.

1.3 Application

ANSI A300 standards shall apply to any person or entity engaged in the business, trade, or performance of repairing, maintaining, or preserving trees, shrubs, or other woody plants.

1.4 Implementation

Specifications for tree maintenance should be written and administered by an arborist.

60 Part 6 – Transplanting standards

60.1 Purpose

The purpose of this document is to provide standards for developing specifications for transplanting and planting trees and shrubs.

60.2 Reasons for transplanting

Transplanting is performed to relocate landscape plants to meet specific objectives. Horticultural production or silvicultural purposes are exempt from this standard.

60.3 Safety

60.3.1 This standard shall not take precedence over arboricultural safe work practices.

60.3.2 Operations shall comply with applicable Department of Transportation (DOT) standards, Occupational Safety and Health Administration (OSHA) standards, ANSI Z133.1, as well as state and local regulations.

60.3.3 The sites shall be inspected for hazards prior to beginning any transplanting procedure.

60.3.3.1 The location of utilities and other obstructions both below and above ground shall be taken into consideration prior to transplanting any tree or plant. Utilities and other obstructions include, but are not limited to gas, electric, communications, sewer, drainage, signage, overpasses, or bridges. Locations include the plant source site, the entire transportation route, and the planting site. Transplanting shall comply with all legal and regulatory requirements for identifying and marking utilities and for highway transport.

61 Normative references

The following standards contain provisions that, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

ANSI Z60.1, Nursery stock

ANSI Z117.1, Safety Requirements for Confined Spaces
ANSI Z133.1, for Arboricultural Operations – Pruning, Trimming, Repairing, Maintaining, and Removing Trees, and Cutting Brush – Safety Requirements


29 CFR 1910, General Industry ¹

29 CFR 1910.146, Permit-required Confined Spaces (PRCS) ²

29 CFR 1910.268, Telecommunications ³

29 CFR 1910.269, Electric Power Generation & Distribution ⁴

29 CFR 1910.331-335, Electrical Safety ⁵

62 Definitions

62.1 arborist: An individual engaged in the profession of arboriculture who, through experience, education and related training, possesses the competence to provide for, or supervise the management of, trees and other woody plants.

62.2 bailed and wrapped: Plants established in the ground that have been prepared for transplanting by digging so that the soil immediately around the roots remains undisturbed. The ball of earth containing the roots of the plant is then bound up.

62.3 bare root (B.R.): Harvested plants from which the soil or growing medium has been removed.

62.4 boxed: A method for protecting roots that includes digging a trench, constructing and installing a box around the roots, and then using the box to lift, transport, and install the landscape plant.

62.5 burlap: A loose-weave fabric that is used to protect plant parts and/or add support to root balls during transplanting operations.

62.5.1 chemically treated burlap: A fabric treated with chemical preservative that biodegrades at a very slow rate.

62.5.2 combination burlap: A fabric with both natural and synthetic fibers that biodegrades at a slow rate.

62.5.3 natural burlap: A material that is 100 percent biodegradable.

62.5.4 synthetic burlap: A material that is not biodegradable.

62.6 caliper: In the landscape or nursery trade, this is the diameter of a tree, measured at a point 6 inches (15 cm) above the ground line if the resulting measurement is no more than 4 inches (10 cm). If the resulting measurement is more than 4 inches (10 cm), the measurement is made at a point 12 inches (30 cm) above the ground line. This in contrast to the method used to measure caliper in the timber industry, which is to make the measurement at a point 4.5 feet (1.4 m) above the ground line, or the “diameter at breast height” (D.B.H.).

62.9 crown: The leaves and branches of a tree measured from the lowest branch on the trunk to the top of the tree.

62.10 D.B.H. [diameter at breast height]: Measurement of trunk diameter taken at 4.5 feet (1.4 m) off the ground.

62.11 digging spade: A specially designed shovel used to dig, shape and form a root ball.

62.12 drum lace: A specific pattern for tying that holds and supports the root ball when transplanting landscape plants with the bailed and wrapped method.

62.13 foam protection: A pre-formed soft foam sheet, pad, or pipe insulation.

62.14 girdling root: A root that may impede proper development of other roots, trunk flare, and/or trunk.

62.15 grade: A datum or reference level, specifically ground level.

62.16 guy: A steel cable or synthetic-fiber cable system installed between a tree and an external anchor to provide supplemental support.

62.17 installation site: The location at which the landscape plant will be installed.

62.18 landscape plants: Trees and woody shrubs.

62.19 lifting chain, certified: A chain certified for a rated load capacity.

¹Available from U.S. Department of Labor, 200 Constitution Avenue, NW, Washington, DC 20210.
62.20 lifting sling, certified: A sling certified for a rated load capacity.

62.21 lifting strap, certified: A strap certified for a rated load capacity.

62.22 percolation test: As used in this standard, a field test conducted to determine water infiltration rate.

62.23 planting: Installing a plant in the landscape.

62.24 protective material: Fabric or device used to limit injury to any portion of the landscape plant during preparation and transplanting operations.

62.25 root ball: The root mass of a tree or shrub after digging or removal from a container.

62.26 root collar: The transition zone between the trunk and the root system.

62.27 root pruning: The cutting of roots to meet specific goals and objectives.

62.28 shall: As used in this standard denotes a mandatory requirement.

62.29 should: As used in this standard denotes an advisory recommendation.

62.30 soil amendment: Any material added to soil to alter its composition and structure, such as sand, fertilizer, or organic matter.

62.31 soil anchor: A device driven, buried, or otherwise inserted into the ground to which a guy is attached.

62.32 specifications, industry-standard: Details that set result-oriented expectations for the manufacture of a specific product or provision of a specific service, written in compliance with industry-consensus standards.

62.33 spreader bar: An apparatus used to spread the lifting chain or strap to avoid damage to the root ball and crown.

62.34 standards, industry-consensus: A set of parameters developed by a group of materially affected parties in accordance with accepted essential requirements for openness, balance, consensus and due process. The parameters provide the minimum requirements and recommendations for manufacture of products, provision of services, or safety.

62.35 tensiometer: An instrument for determining the moisture content of soil.

62.36 thimble: An oblong galvanized or stainless steel fitting with flared margins and an open-ended base.

62.37 transplanting: The process of relocating an existing plant in the landscape.

62.38 tree spade: Equipment used to transplant large trees.

62.39 tree wrap: Material installed on a tree trunk to protect it from injury.

62.40 trunk flare: 1. The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots. 2. The area of transition between the root system and the stem or trunk.

62.41 turnbuckle: A drop-forged, closed eye device for adjusting tension.

62.42 wire basket: A balled and wrapped method (see 62.2) using a pre-fabricated wire mesh basket for support of the root ball.

62.43 wire-wrapped: A balled and wrapped method (see 62.2) using wire or a wire mesh for support of the root ball.

63 Transplanting practices

63.1 Transplanting objectives

Transplanting objectives shall be established prior to beginning operations.

63.2 Plant and site inspection

63.2.1 Compass orientation of trees and shrubs shall be considered.

63.2.2 Ball sizes should be of a diameter and depth to encompass enough of the root system as necessary for establishment. ANSI Z60.1 provides a reference for caliper sizes under 8 inches (20 cm).
63.2.3 Trees with a D.B.H. over 8 inches (20 cm) should have 12 inches (30 cm) or more of root ball diameter for every inch (2.54 cm) of trunk diameter.

63.2.4 Root pruning should be considered prior to transplanting.

63.2.5 A feasibility and suitability assessment shall be conducted prior to recommending transplanting.

63.2.6 Specifications for transplanting should be based on the assessment. See checklist in Annex A.

63.2.7 A soil nutrient analysis, density, texture and percolation test should be performed at the installation site.

63.2.8 Drainage should be adequate for the species being transplanted.

63.2.9 Potential conflict with utilities, lines of sight, buildings, and other infrastructure should be avoided. Tall-growing trees shall not be planted directly under overhead primary distribution and transmission electric lines.

63.2.10 If a condition is observed while the work is being performed requiring attention beyond the original scope of work, the condition shall be reported to an immediate supervisor, the owner, or person responsible for authorizing the work.

63.3 Tools and equipment

63.3.1 Equipment and work practices that cause damage to the plant, beyond the scope of the work, should be avoided.

63.3.2 Digging and root pruning tools shall be sharp in order to cut without breaking, crushing, or tearing roots.

63.3.3 Mechanical digging and root pruning equipment shall be maintained according to manufacturers' recommendations to minimize root damage.

63.3.4 Lifting cables, chains, straps, and/or slings shall be inspected and certified (see Annex B).

63.3.5 Certified lifting cables, chains, straps, and slings shall be used according to manufacturers' instructions and specifications.

63.4 General

63.4.1 The requirements of the individual trees and shrubs shall be considered.

63.4.2 Timing of transplanting

63.4.2.1 Season and phenology of the tree or shrub shall be taken into consideration.

63.4.2.2 Transplanting should occur during the optimum time of year for the species.

63.5 Transplanting practices

63.5.1 Compass orientation of trees and shrubs shall be considered.

63.5.2 Ball sizes should be of a diameter and depth to encompass enough of the root system as necessary for establishment. ANSI Z60.1 provides a reference for caliper sizes under 8 inches (20 cm).

63.5.3 Trees with a D.B.H. over 8 inches (20 cm) should have 12 inches (30 cm) or more of root ball diameter for every inch (2.54 cm) of trunk diameter.

63.5.4 Root ball size shall be specified.

63.5.5 Trunk should be centered in the root ball.

63.5.6 The following shall be considered prior to digging:
   a. root pruning;
   b. crown pruning;
   c. trunk flare depth;
   d. moisture content;
   e. storage;
   f. support systems;
   g. transport; and,
   h. fertilization.

63.5.7 Sites shall be prepared to accept digging operations.

63.5.8 Protection

63.5.8.1 Root ball, trunk, and crown shall be protected from damage beyond the scope of the work.
63.5.9 Digging the tree or shrub

63.5.9.1 The following methods should be considered when specifying a tree or shrub for relocation:
   a. Ballled and wrapped;
   b. Bare root;
   c. Boxed; and,
   d. Tree spade.

63.5.9.2 Mechanical and hand digging operations should start outside the finished root ball size, exception: Mechanical tree spade.

63.5.9.3 Ballled and wrapped

63.5.9.3.1 Methods and materials used to protect or secure the root ball shall hold the ball firmly.

63.5.9.4 Boxed

63.5.9.4.1 Box sides shall be tight against the root ball.

63.5.9.4.2 Box sides should be fastened together to limit movement.

63.5.9.4.3 Box bottom, if installed, shall be tight against the root ball.

63.5.9.4.4 Box top shall be installed if the box will be tilted during transport.

63.5.9.5 Tree spade

63.5.9.5.1 Clearance between the tree or shrub and tree spade shall be provided.

63.5.9.5.2 Tree spade shall be free of fluid leaks with blades properly aligned.

63.5.9.5.3 Adjustments shall be made for differences between slope of the old and new site.

63.5.10 Lifting

63.5.10.1 Prior to lifting root balls, roots should be separated from the surrounding soil.

63.5.10.2 The system used for lifting shall prevent damage to the root ball, trunk, and crown.

63.5.10.3 Spreader bars should be used to distribute forces away from the root ball and to provide crown clearance.

63.5.11 Transporting

63.5.11.1 The system used for transporting shall minimize dessication and other damage to crown, trunk, and root ball.

63.5.12 Storing trees and shrubs before planting

63.5.12.1 The health and vigor of the trees or shrubs shall be maintained during storage.

Fig. 63.5.9.5.3 Example of an adjustment made for differences in slope.
63.6 Planting

63.6.1 Digging the hole

63.6.1.1 The final depth of the planting hole is determined by the depth and firmness of the root ball and other characteristics of the site and shall not exceed the depth of the root ball.

63.6.1.2 The depth of the root ball shall be measured from the bottom of the trunk flare to the bottom of the ball.

63.6.1.3 The soil directly beneath the root ball should be undisturbed or prepared to prevent settling.

63.6.1.4 The planting hole width should be a minimum of 1.5 times the diameter of the root ball.

63.6.1.5 The sides of the planting hole should be scarified.

63.6.2 Installing the tree or shrub

63.6.2.1 Trees or shrubs should be placed in the same compass orientation from which they originated.

63.6.2.2 Bare root plants should be installed so that their root system is evenly distributed in the planting hole.

63.6.2.3 The bottom of the trunk flare shall be at or above the finished grade.

63.6.2.4 All root ball supporting materials should be cut-off from the top third of the root ball and removed from the planting hole prior to final back filling.

63.6.2.5 Backfill should be similar to the soil at the planting site or amended to meet a specific objective.

63.6.2.6 The back-fill soil shall be installed and settled in layered sections to limit future settling and prevent air pockets.

63.6.2.7 Backfill shall not be compacted to a density that inhibits root growth.

63.6.2.8 Water should be added to the root ball and backfill to bring the root ball to field capacity.

63.6.2.9 Mulch should be applied near, but not touching, the trunk out to the perimeter of the planting. Initial depth of organic mulch should be between 2 and 4 inches (5 and 10 cm).

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![Tree Diagram](image)

Trunk Flare

Bottom of Trunk Flare

Measurement for Root Ball Depth

Bottom of Ball

Fig. 63.6.1.2 A discernable trunk flare and related measurements
63.9 Post-planting care practices

63.9.1 Post-planting care shall be specified for an appropriate period of time in consideration of region, site conditions, and species.

63.9.2 Post-planting care for a minimum of one year should be considered.

63.9.3 Specifications for post-planting care should consist of, but are not limited to, one or more of the following:
   a. soil moisture management;
   b. mulching;
   c. integrated pest management;
   d. pruning (see ANSI A300 Part 1 – Pruning standard);
   e. monitoring;
   f. nutrient management (see ANSI A300 Part 2 – Fertilization standard); and,
   g. maintenance/removal of tree support systems (see ANSI A300 Part 3 – Support Systems standard).

Fig. 63.6.1 Example of a properly prepared planting hole.
Annex A
(Informative)

Transplanting information

A-1 Plants with significant defects may not be considered acceptable candidates for transplanting.

A-2 Initial assessment checklist:
   a. general health of the landscape plant(s) including foliage color and density, signs of insect and disease, and past care;
   b. structural condition of the landscape plant(s) including the root system, present defects, past injuries, crown shape, and growing environment;
   c. species data for tolerance of transplanting;
   d. crown shape;
   e. size of root ball/quality of root system;
   f. foliage color or density;
   g. effects of pruning before transplanting; and,
   h. any other related issue that will impact the estimated rate of success.

A-3 The following shall be evaluated in the initial assessment of the existing site and the installation site:
   a. above and below ground hazards;
   b. access;
   c. soil conditions;
   d. obstacles;
   e. slope;
   f. utilities; and,
   g. critical structures, i.e. rooftop plantings.
Annex B
(Informative)

Lifting chain and sling, proper inspection and record-keeping protocol

B-1 Each sling must be affixed with a permanent tag clearly showing the sling's working load limit, type, size, serial number, and manufacturer.

B-2 Each sling should have its own record-keeping file.

B-3 Each sling must have a proof test certificate kept on file for inspectors and company use showing the sling's working load limit, type, size, serial number, lot number, and manufacturer. The proof test shows that the sling is fully OSHA compliant.

B-4 Each sling must have an annual inspection card filed in order to comply with OSHA standards. Each sling must be inspected at least once a year for nicks, gouges, and other defects that might make it unsafe. The inspection card is proof that a qualified person has made these inspections.
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Standard Practices (Pruning)
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* The term pruning type is replaced with the term pruning method. The purpose of this is to label the processes detailed in section 6 with greater accuracy.
Foreword

This foreword is not part of American National Standard A300 (Part 1)-2008 Pruning

ANSI A300 Standards are divided into multiple parts, each focusing on a specific aspect of woody plant management (e.g. Pruning, Fertilization, etc).

These standards are used to develop written specifications for work assignments. They are not intended to be used as specifications in and of themselves. Management objectives may differ considerably and therefore must be specifically defined by the user. Specifications are then written to meet the established objectives and must include measurable criteria.

ANSI A300 standards apply to professionals who provide for or supervise the management of trees, shrubs, and other woody landscape plants. Intended users include businesses, government agencies, property owners, property managers, and utilities. The standard does not apply to agriculture, horticultural production, or silviculture, except where explicitly noted otherwise.

This standard has been developed by the Tree Care Industry Association (TCIA), an ANSI-accredited Standards Developing Organization (SDO). TCIA is secretariat of the ANSI A300 standards, and develops standards using procedures accredited by the American National Standards Institute (ANSI).

Consensus for standards writing was developed by the Accredited Standards Committee on Tree, Shrub, and Other Woody Plant Management Operations – Standard Practices, A300 (ASC A300).

Prior to 1991, various industry associations and practitioners developed their own standards and recommendations for tree care practices. Recognizing the need for a standardized, scientific approach, green industry associations, government agencies and tree care companies agreed to develop consensus for an official American National Standard.

The result – ANSI A300 standards – unify and take authoritative precedence over all previously existing tree care industry standards. ANSI requires that approved standards be developed according to accepted principles, and that they be reviewed and, if necessary, revised every five years.

TCIA was accredited as a standards developing organization with ASC A300 as the consensus body on June 28, 1991. ASC A300 meets regularly to write new, and review and revise existing ANSI A300 standards. The committee includes industry representatives with broad knowledge and technical expertise from residential and commercial tree care, utility, municipal and federal sectors, landscape and nursery industries, and other interested organizations.

Suggestions for improvement of this standard should be forwarded to: A300 Secretary, c/o Tree Care Industry Association, Inc., 136 Harvey Road - Suite B101-B110, Londonderry, NH, 03053.

ANSI A300 (Part 1)-2008 Pruning was approved as an American National Standard by ANSI on May 1, 2008. ANSI approval does not require unanimous approval by ASC A300. The ASC A300 committee contained the following members at the time of ANSI approval:

Tim Johnson, Chair
(Artistic Arborist, Inc.)

Bob Rouse, Secretary
(Tree Care Industry Association, Inc.)

(Continued)
### Organizations Represented

<table>
<thead>
<tr>
<th>Organization</th>
<th>Name of Representative</th>
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<tbody>
<tr>
<td>American Nursery and Landscape Association</td>
<td>Warren Quinn</td>
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<tr>
<td>American Society of Consulting Arborists</td>
<td>Donald Zimar</td>
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<tr>
<td>American Society of Landscape Architects</td>
<td>Ron Leighton</td>
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<td>Asplundh Tree Expert Company</td>
<td>Geoff Kempter</td>
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<td>Bartlett Tree Expert Company</td>
<td>Peter Fengler (Alt.)</td>
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<td>Davey Tree Expert Company</td>
<td>Joseph Tommasi</td>
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<tr>
<td>International Society of Arboriculture</td>
<td>R.J. Laverne (Alt.)</td>
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<td>National Park Service</td>
<td>Sharon Lilly (Alt.)</td>
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<td>Professional Grounds Management Society</td>
<td>Bruce Hagen</td>
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<td>Professional Land Care Network</td>
<td>Dr. James Sherald (Alt.)</td>
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<td>Society of Municipal Arborists</td>
<td>Gordon Mann</td>
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<td>Tree Care Industry Association</td>
<td>Andy Hillman (Alt.)</td>
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<td>USDA Forest Service</td>
<td>Dane Buell</td>
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<td>Utility Arborist Association</td>
<td>James McGuire (Alt.)</td>
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<td>Ed Macle</td>
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<td>Keith Cline (Alt.)</td>
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</tbody>
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### Additional organizations and individuals:

- American Forests (Observer)
- Mike Galvin (Observer)
- Peter Gerstenberger (Observer)
- Dick Jones (Observer)
- Myron Labile (Observer)
- Beth Palsys (Observer)
- Richard Rathjens (Observer)
- Richard Roux (NFPA-780 Liaison)

### ASC A300 mission statement:

Mission: To develop consensus performance standards based on current research and sound practice for writing specifications to manage trees, shrubs, and other woody plants.
American National Standard

for Tree Care Operations —

Tree, Shrub, and Other
Woody Plant
Maintenance —
Standard Practices
(Pruning)

1 ANSI A300 standards

1.1 Scope

ANSI A300 standards present performance standards for the care and management of trees, shrubs, and other woody plants.

1.2 Purpose

ANSI A300 performance standards are intended for use by federal, state, municipal and private entities including arborists, property owners, property managers, and utilities for developing written specifications.

1.3 Application

ANSI A300 performance standards shall apply to any person or entity engaged in the management of trees, shrubs, or other woody plants.

2 Part 1 – Pruning standards

2.1 Purpose

The purpose of Part 1 —Pruning is to provide performance standards for developing written specifications for pruning.

2.2 Reasons for pruning

The reasons for tree pruning may include, but are not limited to, reducing risk, managing tree health and structure, improving aesthetics, or achieving other specific objectives. Pruning practices for agricultural, horticultural production, or silvicultural purposes are exempt from this standard unless this standard, or a portion thereof, is expressly referenced in standards for these other related areas.

2.3 Implementation

2.3.1 Specifications for pruning should be written and administered by an arborist.

2.3.1.1 Specifications should include location of tree(s), objectives, methods (types), and extent of pruning (location, percentage, part size, etc).

2.3.2 Pruning specifications shall be adhered to.

2.4 Safety

2.4.1 Pruning shall be implemented by an arborist, familiar with the practices and hazards of pruning and the equipment used in such operations.

2.4.2 This performance standard shall not take precedence over applicable industry safe work practices.

2.4.3 Performance shall comply with applicable Federal and State Occupational Safety and Health standards, ANSI Z133.1, Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and other Federal Environmental Protection Agency (EPA) regulations, as well as state and local regulations.

3 Normative references

The following standards contain provisions, which, through reference in the text, constitute provisions of this American National Standard. All standards are subject to revision, and parties to agreements based on this American National Standard shall apply the most recent edition of the standards indicated below.

ANSI Z60.1, Nursery stock
ANSI Z133.1, Arboriculture – Safety requirements
29 CFR 1910, General industry 1)
29 CFR 1910.268, Telecommunications 1)
29 CFR 1910.269, Electric power generation, transmission, and distribution 1)
29 CFR 1910.331 - 335, Electrical safety-related work practices 1)

4 Definitions

4.1 arboriculture: The art, science, technology, and business of commercial, public, and utility tree care.

1) Available from U.S. Department of Labor, 200 Constitution Avenue, NW, Washington, DC 20210
4.2 **arborist:** An individual engaged in the profession of arboriculture who, through experience, education, and related training, possesses the competence to provide for or supervise the management of trees and other woody plants.

4.3 **arborist trainee:** An individual undergoing on-the-job training to obtain the experience and the competence required to provide for or supervise the management of trees and other woody plants. Such trainees shall be under the direct supervision of an arborist.

4.4 **branch:** A shoot or stem growing from a parent branch or stem (See Fig. 4.4).

4.4.1 **codominant branches/codominant leaders:** Branches or stems arising from a common junction, having nearly the same size diameter (See Fig. 4.4).

4.4.2 **lateral branch:** A shoot or stem growing from another branch (See Fig. 4.4).

4.4.3 **parent branch or stem:** A tree trunk or branch from which other branches or shoots grow (See Fig. 4.4).

4.4.4 **scaffold branch:** A primary branch that forms part of the main structure of the crown (See Fig. 4.4).

4.5 **branch bark ridge:** The raised area of bark in the branch crotch that marks where the branch and parent stem meet. (See Figs. 5.3.2 and 5.3.3).

4.6 **branch collar:** The swollen area at the base of a branch.

4.7 **callus:** Undifferentiated tissue formed by the cambium around a wound.

4.8 **cambium:** The dividing layer of cells that forms sapwood (xylem) to the inside and inner bark (phloem) to the outside.

4.9 **clean:** Selective pruning to remove one or more of the following non-beneficial parts: dead, diseased, and/or broken branches (7.2).

4.10 **climbing spurs:** Sharp, pointed devices strapped to a climber's lower legs used to assist in climbing trees. (syn.: gaffs, hooks, spurs, spikes, climbers)

4.11 **closure:** The process in a woody plant by which woundwood grows over a pruning cut or injury.

4.12 **crown:** Upper part of a tree, measured from the lowest branch, including all the branches and foliage.

4.13 **decay:** The degradation of woody tissue caused by microorganisms.

4.14 **espalier:** The combination of pruning, supporting, and training branches to orient a plant in one plane (6.5).

4.15 **establishment:** The point after planting when a tree's root system has grown sufficiently into the surrounding soil to support growth and anchor the tree.

4.16 **facility:** A structure or equipment used to deliver or provide protection for the delivery of an essential service, such as electricity or communications.

4.17 **frond:** A leaf structure of a palm.

4.18 **heading:** The reduction of a shoot, stem, or branch back to a bud or to a lateral branch not large enough to assume the terminal role.
4.19 interfering branches: Crossing, rubbing, or upright branches that have the potential to damage tree structure and/or health.

4.20 internode: The area between lateral branches or buds.

4.21 job briefing: The communication of at least the following subjects for arboricultural operations: work specifications, hazards associated with the job, work procedures involved, special precautions, electrical hazards, job assignments, and personal protective equipment.

4.22 leader: A dominant, typically upright, stem—usually the main trunk. There can be several leaders in one tree.

4.23 lion's tailing: The removal of an excessive number of inner and/or lower lateral branches from parent branches. Lion's tailing is not an acceptable pruning practice (6.1.7).

4.24 live crown ratio: Crown height relative to overall plant height.

4.25 mechanical pruning: A pruning technique where large-scale power equipment is used to cut back branches (9.3.2).

4.26 method: A procedure or process for achieving an objective.

4.27 peeling: The removal of dead frond bases without damaging living trunk tissue at the point they make contact with the trunk. (syn.: shaving)

4.28 petiole: A stalk of a leaf or frond.

4.29 pollarding: Pruning method in which tree branches are initially headed and then reduced on a regular basis without disturbing the callus knob (6.6).

4.30 pruning: The selective removal of plant parts to meet specific goals and objectives.

4.31 qualified line-clearance arborist: An individual who, through related training and on-the-job experience, is familiar with the equipment and hazards in line clearance and has demonstrated the ability to perform the special techniques involved. This individual may or may not be currently employed by a line-clearance contractor.

4.32 qualified line-clearance arborist trainee: An individual undergoing line-clearance training under the direct supervision of a qualified line-clearance arborist. In the course of such training, the trainee becomes familiar with the equipment and hazards in line clearance and demonstrates ability in the performance of the special techniques involved.

4.33 raise: Pruning to provide vertical clearance (7.3).

4.34 reduce: Pruning to decrease height and/or spread (7.4).

4.35 remote area: As used in the utility pruning section of this standard, an unpopulated area.

4.36 restoration: Pruning to redevelop structure, form, and appearance of topped or damaged trees (6.3).

4.37 rural area: As used in the utility pruning section of this standard, a sparsely populated place away from large cities, suburbs, or towns but distinct from remote areas.

4.38 shall: As used in this standard, denotes a mandatory requirement.

4.39 shoot: Stem or branch and its leaves, especially when young.

4.40 should: As used in this standard, denotes an advisory recommendation.

4.41 specifications: A document stating a detailed, measurable plan or proposal for provision of a product or service.

4.42 sprouts: New shoots originating from epicormic or adventitious buds, not to be confused with suckers. (syn.: watersprouts, epicormic shoots)

4.43 standard, ANSI A300: The performance parameters established by industry consensus as a rule for the measure of extent, quality, quantity, value or weight used to write specifications.

4.44 stem: A woody structure bearing buds, foliage, and giving rise to other stems.

4.45 structural pruning: Pruning to improve branch architecture (6.2).
4.46 stub: Portion of a branch or stem remaining after an internodal cut or branch breakage.

4.47 subordination: Pruning to reduce the size and ensuing growth rate of a branch or leader in relation to other branches or leaders.

4.48 sucker: Shoot arising from the roots.

4.49 thin: Pruning to reduce density of live branches (7.5).

4.50 throw line: A small, lightweight line with a weighted end used to position a climber's rope in a tree.

4.51 topping: Reduction of tree size using internodal cuts without regard to tree health or structural integrity. Topping is not an acceptable pruning practice (6.1.7).

4.52 tracing: The removal of loose, damaged tissue from in and around the wound.

4.53 trunk: The main woody part of a tree beginning at and including the trunk flare and extending up into the crown from which scaffold branches grow.

4.54 trunk flare: 1. The area at the base of the plant's trunk where it broadens to form roots. 2. The area of transition between the root system and trunk (syn.: root flare).

4.55 urban/residential areas: Populated areas including public and private property that are normally associated with human activity.

4.56 utility: A public or private entity that delivers a public service, such as electricity or communications.

4.57 utility space: The physical area occupied by a utility's facilities and the additional space required to ensure its operation.

4.58 vista/view prune: Pruning to enhance a specific view without jeopardizing the health of the tree (6.4).

4.59 wound: An opening that is created when the bark of a live branch or stem is cut, penetrated, damaged, or removed.

4.60 woundwood: Partially differentiated tissue responsible for closing wounds. Woundwood develops from callus associated with wounds.

5 Pruning practices

5.1 Tree inspection

5.1.1 An arborist or arborist trainee shall visually inspect each tree before beginning work.

5.1.2 If a condition is observed requiring attention beyond the original scope of the work, the condition should be reported to an immediate supervisor, the owner, or the person responsible for authorizing the work.

5.1.3 Job briefings shall be performed as outlined in ANSI Z133.1, subclause 3.1.4.

5.2 Tools and equipment

5.2.1 Equipment, tools, and work practices that damage living tissue and bark beyond the scope of normal work practices shall be avoided.

5.2.2 Climbing spurs shall not be used when entering and climbing trees for the purpose of pruning.

Exceptions:
- when branches are more than throw-line distance apart and there is no other means of climbing the tree;
- when the outer bark is thick enough to prevent damage to the inner bark and cambium;
- in remote or rural utility rights-of-way.

5.3 Pruning cuts

5.3.1 Pruning tools used in making pruning cuts shall be sharp.

5.3.2 A pruning cut that removes a branch at its point of origin shall be made close to the trunk or parent branch without cutting into the branch bark ridge or branch collar or leaving a stub (see Figure 5.3.2).
5.3.4 When pruning to a lateral, the remaining lateral branch should be large enough to assume the terminal role.

5.3.5 The final cut should result in a flat surface with adjacent bark firmly attached.

5.3.6 When removing a dead branch, the final cut shall be made just outside the collar of living tissue.

5.3.7 Tree branches shall be removed in such a manner so as to avoid damage to other parts of the tree or to other plants or property. Branches too large to support with one hand shall be precut to avoid splitting of the wood or tearing of the bark (see Figure 5.3.2). Where necessary, ropes or other equipment shall be used to lower large branches or portions of branches to the ground.

5.3.8 A cut that removes a branch with a narrow angle of attachment should be made from the outside of the branch to prevent damage to the parent branch (see Figure 5.3.8).

5.3.9 Severed branches shall be removed from the crown upon completion of the pruning, at times when the tree would be left unattended, or at the end of the workday.

5.4 Wound treatment

5.4.1 Wound treatments shall not be used to cover wounds or pruning cuts, except when necessary for disease, insect, mistletoe, or sprout control, or for cosmetic reasons.
5.4.2 Wound treatments that are damaging to tree tissues shall not be used.

5.4.3 When tracing wounds, only loose, damaged tissue shall be removed.

6 Pruning objectives

6.1 Pruning objectives shall be established prior to beginning any pruning operation.

6.1.1 Objectives should include, but are not limited to, one or more of the following:
  • Risk reduction
  • Manage health
  • Clearance
  • Structural improvement/correction
  • View improvement/creation
  • Aesthetic Improvement
  • Restoration

6.1.2 Established objectives should be specified in writing (See Annex B – Specification writing guideline).

6.1.3 To obtain the defined objective, the growth cycles, structure, species, and the extent of pruning to be performed shall be considered.

6.1.4 Not more than 25 percent of the foliage should be removed within an annual growing season. The percentage and distribution of foliage to be removed shall be adjusted according to the plant's species, age, health, and site.

6.1.5 When frequent excessive pruning is necessary for a tree to avoid conflicts with elements such as infrastructure, view, traffic, or utilities, removal or relocation of the tree shall be considered.

6.1.6 Pruning cuts should be made in accordance with section 5.3 Pruning cuts.

6.1.7 Topping and lion's tailing shall be considered unacceptable pruning practices for trees.

6.2 Structural: Structural pruning shall consist of selective pruning to improve tree and branch architecture primarily on young- and medium-aged trees.

6.2.1 Size and location of leaders or branches to be subordinated or removed should be specified.

6.2.2 Dominant leader(s) should be selected for development as appropriate.

6.2.3 Strong, properly spaced scaffold branch structure should be selected and maintained by reducing or removing others.

6.2.4 Temporary branches should be retained or reduced as appropriate.

6.2.5 Interfering, oversimplified, defective, weak, and poorly attached branches should be removed or reduced.

6.2.6 At planting, pruning should be limited to cleaning (7.2).

6.3 Restoration: Restoration shall consist of selective pruning to redevelop structure, form, and appearance of severely pruned, vandalized, or damaged trees.

6.3.1 Location in tree, size range of parts, and percentage of sprouts to be removed should be specified.

6.4 Vista/view: Vista/view pruning shall consist of the use of one or more pruning methods (types) to enhance a specific line of sight.

6.4.1 Pruning methods (types) shall be specified.

6.4.2 Size range of parts, location in tree, and percentage of foliage to be removed should be specified.

6.5 Espalier

6.5.1 Branches that extend outside the desired plane of growth shall be pruned or tied back.

6.5.2 Ties should be replaced as needed to prevent girdling the branches at the attachment site.

6.6 Pollarding

6.6.1 Consideration shall be given to the ability of the individual tree to respond to pollarding.

6.6.2 Management plans shall be made prior to the start of the pollarding process for routine removal of sprouts.
6.6.3 Heading cuts shall be made at specific locations to start the pollarding process. After the initial cuts are made, no additional heading cuts shall be made.

6.6.4 Sprouts growing from the cut ends of branches (knots) should be removed annually during the dormant season.

7 Pruning methods (types)

7.1 One or more of the following methods (types) shall be specified to achieve the objective.

7.2 Clean: Cleaning shall consist of pruning to remove one or more of the following non-beneficial parts: dead, diseased, and/or broken branches.

7.2.1 Location of parts to be removed shall be specified.

7.2.2 Size range of parts to be removed shall be specified.

7.3 Raise: Raising shall consist of pruning to provide vertical clearance.

7.3.1 Clearance distance shall be specified.

7.3.2 Location and size range of parts to be removed shall be specified.

7.3.3 Live crown ratio should not be reduced to less than 50 percent.

7.4 Reduce: Reducing shall consist of pruning to decrease height and/or spread.

7.4.1 Consideration shall be given to the ability of a species to tolerate this type of pruning.

7.4.2 Location of parts to be removed or clearance requirements shall be specified.

7.4.3 Size of parts should be specified.

7.5 Thin: Thinning shall consist of selective pruning to reduce density of live branches.

7.5.1 Thinning should result in an even distribution of branches on individual branches and throughout the crown.

7.5.2 Not more than 25 percent of the crown should be removed within an annual growing season.

7.5.3 Location of parts to be removed shall be specified.

7.5.4 Percentage of foliage and size range of parts to be removed shall be specified.

8 Palm pruning

8.1 Palm pruning should be performed when fronds, fruit, or loose petioles may create a dangerous condition.

8.2 Live healthy fronds should not be removed.

8.3 Live, healthy fronds above horizontal shall not be removed. Exception: Palms encroaching on electric supply lines (see Fig. 8.3a and 8.3b).

Figure 8.3a Frond removal location.
9 Utility pruning

9.1 Purpose

The purpose of utility pruning is to prevent the loss of service, comply with mandated clearance laws, prevent damage to equipment, maintain access, and uphold the intended usage of the facility/utility space while adhering to accepted tree care performance standards.

9.2 General


9.2.2 Utility pruning operations are exempt from requirements in subclause 5.1, Tree Inspection, for conditions outside the utility pruning scope of work.

9.2.3 Job briefings shall be performed as outlined in ANSI Z133.1, subclause 3.1.4.

9.3 Utility crown reduction pruning

9.3.1 Urban/residential areas

9.3.1.1 Pruning cuts should be made in accordance with subclause 5.3, Pruning cuts. The following requirements and recommendations of 9.3.1.1 are repeated from subclause 5.3 Pruning cuts.

9.3.1.1.1 A pruning cut that removes a branch at its point of origin shall be made close to the trunk or parent branch, without cutting into the branch bark ridge or collar, or leaving a stub (see Figure 5.3.2).

9.3.1.1.2 A pruning cut that reduces the length of a branch or parent stem shall be made at a slight downward angle relative to the remaining stem and not damage the remaining stem. Smaller cuts shall be preferred (see Fig. 5.3.3).

9.3.1.1.3 The final cut shall result in a flat surface with adjacent bark firmly attached.

9.3.1.1.4 When removing a dead branch, the final cut shall be made just outside the collar of living tissue.

9.3.1.1.5 Tree branches shall be removed in such a manner so as not to cause damage to other parts of the tree or to other plants or property. Branches too large to support with one hand shall be precut to avoid splitting of the wood or tearing of the bark (see Figure 5.3.2). Where necessary, ropes or other equipment shall be used to lower large branches or portions of branches to the ground.

9.3.1.1.6 A cut that removes a branch with a narrow angle of attachment should be made from the outside of the branch to prevent damage to the parent branch (see Figure 5.3.8).
9.3.1.2 A minimum number of pruning cuts should be made to accomplish the purpose of facility/utility pruning. The structure and growth habit of the tree should be considered.

9.3.1.3 Trees directly under and growing into facility/utility spaces should be removed or pruned. Such pruning should be done by removing entire branches or leaders or by removing branches that have laterals growing into (or once pruned, will grow into) the facility/utility space.

9.3.1.4 Trees growing next to, and into or toward, facility/utility spaces should be pruned by reducing branches to laterals (5.3.3) to direct growth away from the utility space or by removing entire branches. Branches that, when cut, will produce sprouts that would grow into facilities and/or utility space should be removed.

9.3.1.5 Branches should be cut to laterals or the parent branch and not at a pre-established clearing limit. If clearance limits are established, pruning cuts should be made at laterals or parent branches outside the specified clearance zone.

9.3.2 Rural/remote locations – mechanical pruning

Cuts should be made close to the main stem, outside of the branch bark ridge and branch collar. Precautions should be taken to avoid stripping or tearing of bark or excessive wounding.

9.4 Emergency service restoration

During a utility-declared emergency, service must be restored as quickly as possible in accordance with ANSI Z133.1, 29 CFR 1910.331 – 335, 29 CFR 1910.288, or 29 CFR 1910.289. At such times, it may be necessary, because of safety and the urgency of service restoration, to deviate from the use of proper pruning techniques as defined in this standard. Following the emergency, corrective pruning should be done as necessary.
Annex A
Pruning cut guideline

A-1  Three-cut method
Multiple cutting techniques exist for application of a three-cut method. A number of them may be used to implement an acceptable three-cut method.

A-1.1  The technique depicted in Figure 5.3.2 demonstrates one example of a three-cut method that is common to hand-saw usage. It is not intended to depict all acceptable three-cut method techniques.
Annex B
Specification writing guideline

A300 (Part 1)-2008 Pruning standards are performance standards, and shall not be used as job specifications. Job specifications should be clearly detailed and contain measurable criteria.

The words "should" and "shall" are both used when writing standards. The word "shall" is used when writing specifications.

Writing specifications can be simple or complex and can be written in a format that suits your company/the job. The specifications consist of two sections.

I. General:
This section contains all aspects of the work to be performed that needs to be documented, yet does not need to be detailed.

Saying under the General section that "all work shall be completed in compliance with A300 Standards" means the clauses covering safety, inspections, cuts, etc. will be adhered to. There is no need to write each and every clause into every job specification.

Other items that may be covered in the General section could be: work hours and dates, traffic issues, disposal criteria, etc.

The second section under Job Specifications would be:

II. Details:
This section provides the clear and measurable criteria; the deliverables to the client.

This section, to be written in compliance with A300 standards, shall contain the following information:

1. Objective – Clause 6
   These objectives originate from/with the tree owner or manager. The arborist shall clearly state what is going to be done to achieve the objective(s).

   Objectives can be written for the entire job or individual trees. Rarely can one or two words clearly convey an objective so that all parties involved (client, sales, crew, etc.) can visualize the outcome.

2. Method – Clause 7
   Here the method(s) to be used to achieve the objective are stated. Again, depending on the type of job, this can be stated for the individual tree or a group of trees.

3. Location – Clause 7.2.1, 7.3.2, 7.4.2, 7.5.3
   This is the location in the tree(s) that the work methods are to take place.

4. Density – Clause 7.3.1, 7.3.3, 7.5.1, 7.5.2, 7.5.4
   This is the amount or volume of parts that are to be removed and can be stated exactly or in ranges.

5. Size – Clause 7.2.2, 7.3.2, 7.4.3, 7.5.4
   This is the size or range of sizes of cut(s) utilized to remove the volume specified.

   NOTE: Items # 4 & 5 are directly related to resource allocation, staffing and dollars.

SAMPLE PRUNING SPECIFICATIONS

#1. Scope: Large live oak on west side of pool

Objectives: Increase light penetration through east side of tree. Reduce risk potential of 1-inch-diameter branches falling.

Specifications: All broken branches and 1-inch-plus diameter dead branches shall be removed from the crown.

   The three lowest 8-inch-plus diameter branches on the east side shall be thinned 25 percent with 1-inch- to 3-inch-diameter cuts.

   NOTE: All work shall be completed in compliance with ANSI A300 and Z133.1 Standards.
Annex B
Specification writing guideline

#2. Scope: 1 Arizona ash

Objective: Enhance structure/structural development.

Specifications: General:
- All pruning shall be completed in compliance with A300 Standards.

Detail:
- Thin crown 20-25 percent with 1-inch- to 4-inch-diameter cuts. Reduce west codominant leader by approximately 12 feet.

#3. Scope: Twenty-three newly installed evergreen elms

Objective: Maximize establishment – reduce nuisance while enhancing natural growth habit.
- All work shall be completed in compliance with A300 Standards and the following specifications.

Specifications:
- Retain as much size as possible and 80-90 percent density of foliage.
- Lowest permanent branch will be 6 feet above grade in four to five years.
- Retain all sprout growth originating 18 inches above grade on trunk and 4 inches out from branch attachments throughout crown.
- Remove weakest rubbing branches.
- Remove dead branches.
- Reduce broken branches or branches with dead ends back to live laterals or buds. Heading cuts can be used.
- Maintain all growth originating between 1.5 feet (18 inches) and 6 feet 6 inches (78 inches) behind adjacent edge of walks. Heading cuts are OK.

Pruning Specification Writing Flowchart
Annex C
Applicable ANSI A300 interpretations

The following interpretations apply to Part 1 - Pruning:

C-1 Interpretation of "should" in ANSI A300 standards

"An advisory recommendation" is the common definition of "should" used in the standards development community and the common definition of "should" used in ANSI standards. An advisory notice is not a mandatory requirement. Advisory recommendations may not be followed when defensible reasons for non-compliance exist.

C-2 Interpretation of "shall" in ANSI A300 standards

"A mandatory requirement" is the common definition of "shall" used in the standards development community and the common definition of "shall" used in ANSI standards. A mandatory requirement is not optional and must be followed for ANSI A300 compliance.