

**ORIGINAL**

**BEFORE THE FLORIDA  
PUBLIC SERVICE COMMISSION**

**DOCKET NO. 060198-EI  
FLORIDA POWER & LIGHT COMPANY**

**IN RE: REQUIREMENT FOR INVESTOR-OWNED  
ELECTRIC UTILITIES TO FILE ONGOING STORM  
PREPAREDNESS PLANS AND IMPLEMENTATION  
COST ESTIMATES.**

**DECEMBER 20, 2006**

**DIRECT TESTIMONY & EXHIBITS OF:**

**JOHN A. HARRIS  
(RESPONSE TO CITY OF NORTH MIAMI PETITION)**

DOCUMENT NUMBER-DATE

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5                   **DECEMBER 20, 2006**

6   **Q:    Please state your name and business address.**

7   A:    My name is John A. Harris. My business address is Landscape Economics, LLC,  
8         6918 Stirling Road, Hollywood, Florida 33024.

9   **Q.    By whom are you employed and what is your position?**

10 A:    I am the Principal of Landscape Economics LLC, an expert firm providing economic  
11         valuations, work audits, and expert testimony regarding landscapes and land  
12         improvements.

13 **Q.    Please describe your duties and responsibilities in that position.**

14 A:    I am a Landscape Economist, and my responsibilities include evaluating conditions of  
15         landscape items, reviewing contract terms and conditions, determining quality of  
16         landscape items, and determining values for landscape items.

17 **Q.    Please describe your educational background and professional experience.**

18 A:    I have a Master of Science in Forest Economics, from the College of Environmental  
19         Science and Forestry (CESF) in Syracuse, NY; Master of Business Administration in  
20         Organizational Management from Syracuse University, Syracuse, NY; a Bachelor of  
21         Science in Resources Management, CESF, Syracuse, NY and Associate of Applied  
22         Science in Natural Resources Conservation, Morrisville Agricultural and Technical  
23         College, Morrisville, NY. Through continuing education and certification programs, I  
24         hold various arboricultural and landscape industry specializations used in my work.

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My professional experience includes work doing landscape maintenance and tree work as the owner/operator of JAH Grounds Maintenance, doing timber stand inventory for International Paper in northern Maine, doing line clearance audits in Alberta Canada and Florida as a Consulting Forester, managing a landscape maintenance and tree service named Sunbelt Landscape Management in Medley Florida, being a consulting forester and certified arborist with Tree Advisors in South Miami Florida, President and certified forester with Earth Advisors in Hollywood Florida, and the Principal and Landscape Economist with Landscape Economics in Hollywood Florida. I also have experience as an independent reviewer, auditor, and/or expert in private disputes, damage claims, and work audits involving landscape items and land improvement items in New England, New York, North Carolina, Georgia, Alabama, Mississippi, Louisiana, Florida and the Bahamas.

**Q: Are you sponsoring any exhibits in this case?**

- A: Yes, I am sponsoring the following exhibits, which are attached to my testimony:
- JAH-1 -- Photographs showing the results of arboricultural work done on trees in public Right-of-Ways in the City of North Miami.
  - JAH-2 -- ANSI A-300 Standards- relevant pages only.
  - JAH-3 -- Miami-Dade County Tree Preservation Code- relevant sections only.
  - JAH-4 -- City of North Miami Landscape Standards and Tree Preservation Codes- relevant sections only.
  - JAH-5 -- Best Management Practices- Utility Pruning of Trees, special companion publication to the ANSI A-300 Part 1: Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices, Pruning; relevant pages only.

1 **Q: What is the purpose of your testimony?**

2 A. The purpose of my testimony is as follows:

- 3 1. To describe the Vegetation Management (“VM”) codes, regulations and  
4 standards of practice which apply to FPL’s VM program.
- 5 2. To discuss the results of my review of FPL’s VM activities within the City of  
6 North Miami (the “City”), based on personal observation of a random sample  
7 of work done in the City over the 12-36 months ending November 2006; and  
8 to evaluate FPL’s compliance with the applicable codes, regulations and  
9 standards of practice in performing those VM activities.
- 10 3. To comment on the overall adequacy of FPL’s VM practices and how they  
11 compare within the electric utility industry.

12 **Q: What is your relationship to FPL?**

13 A: I have been contracted as an independent expert to review FPL’s current VM program  
14 and evaluate the testimony of the City’s witnesses.

15 **Q: How did you obtain the information necessary for your review and evaluation?**

16 A: I interviewed employees of FPL’s VM Program, reviewed documents relevant to this  
17 case that were supplied at my request by FPL, reviewed the prepared direct testimony  
18 of FPL witnesses Manuel Miranda and William Slaymaker and the City’s witnesses  
19 Terry Lytle and Keith Miller, and performed independent research for information  
20 regarding this case and VM work done in the City of North Miami during the last 1-3  
21 years.

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1                   **APPLICABLE VM CODES, REGULATIONS AND STANDARDS**

2   **Q:    What regulations, codes and standards, are applicable to the FPL VM work**  
3           **performed in the City?**

4    A:    These standards are normally discussed as a progression from national standards, to  
5           state, then county, then the local municipality. I will follow this same progression.  
6           The industry standard for arboriculture is ANSI A-300,. The applicable sections of  
7           this national industry standard are shown in Exhibit JAH-2. This standard is voluntary  
8           for arboricultural practices, but can become law when referenced as required in  
9           jurisdictional codes and regulations (see Exhibit JAH-3, 18A-11 (C) (6)). ANSI A-  
10          300 contains a specific tree pruning category for utility pruning (Page 7, Section 5.9).  
11          The purpose of pruning in this utility category is to provide for safe clearances  
12          surrounding electric lines and prevent the loss of service. Safety standards, pruning  
13          cut standards, and emergency restoration standards are described in Section 5.9. FPL  
14          references these standards in its VM Guidelines, its specifications for Line Clearance  
15          Contractors, and in public education publications. These standards have been  
16          followed by FPL VM in the City of North Miami for the work inspected.

17  
18          The National Electric Safety Code also applies to VM work. As presented in the FPL  
19          Direct Testimony of William Slaymaker, Section 218 Tree Trimming requires FPL to  
20          clear vegetation growth around electric lines. The issue of public safety and reliable  
21          electric supply is taken from this national code and referenced in the Miami-Dade  
22          County Code. The need for public safety and reliable electric power as presented in  
23          the reviewed codes, supersedes any standards for arboricultural practices and

1 concerns or standards related to the trimmed appearance of trees. FPL VM has  
2 followed the NESC standards in the City of North Miami for the work inspected.

3  
4 There are BMPs (Best Management Practices) Manuals that are companions to the  
5 ANSI A-300. Exhibit JAH-5 is the BMP for Utility Pruning. This publication  
6 provides guidance and specifications for meeting the ANSI A-300 standard. The most  
7 relevant sections are Pages 10-14, describing directional pruning, clearing limits (line  
8 clearance distances), and the damages to trees from hatracking (round over and  
9 stubbing cuts). The description of proper pruning or trimming cuts and directional  
10 pruning in the FPL VM guidelines are consistent with this publication. The necessity  
11 to relax the pruning standards for expediting work during storm restoration is  
12 addressed on Page 20 of the Manual and is similar to the allowance written in the  
13 Miami-Dade County Codes and City of North Miami Codes. Diagrams for sample  
14 tree trimming practices are shown in the Manual and these are similar to the diagrams  
15 produced by FPL for VM guidelines and for public education purposes.

16  
17 The requirements for tree pruning throughout Miami-Dade County are found in the  
18 Miami-Dade County Code (the "M-DC Code"). The relevant sections are shown in  
19 Exhibit JAH-3. Section 18A-11. Landscape Maintenance, sets forth the acceptable  
20 pruning and cutting practices for arboricultural work. I would like to point out that,  
21 while the general rule under the M-DC Code is that no more than 1/3 of a tree's  
22 canopy should be removed during trimming, it contains an exception that allows FPL  
23 to remove more than 1/3 of the canopy on one side of a tree if this is for hazard  
24 reduction or clearance pruning (see 18A-11 (C) (3)). I also would like to point out

1 Section 8AA-159(d), which is applicable to the clearing and trimming of vegetation  
2 surrounding electric utility facilities and directs such utilities to do any necessary  
3 trimming, or vegetation management, to protect the health safety and welfare of the  
4 public. Some trees inspected in the City of North Miami did have more than 1/3 of  
5 the canopy removed for line clearance pruning, which is allowed by the standards and  
6 applicable codes. FPL VM has followed the M-DC Code in the City of North Miami  
7 for the work inspected.

8  
9 Finally, the City has its own regulations concerning pruning, trimming and removal  
10 of trees, found in Article II, Trees, of the City of North Miami Code (the NM Code”).  
11 Section 20-23 of the NM Code sets forth the trimming standards applicable within the  
12 City. Section 20-23 (a) (1) specifically allows tunneling or drop crotch trimming to  
13 provide clearance for overhead utility lines. Section 20-16(d) of the NM Code  
14 exempts certain species of trees from any tree trimming requirements. These are  
15 currently *Bischofia javanica*, *Ficus benjamini*, *Ficus elastica*, *Ficus aurea*, *Araucaria*  
16 *heterophylla*.

17  
18 I would like to point out that the NM Code contains some conflicts between sections  
19 that can make it appear certain practices constitute tree abuse, even though they are  
20 specifically allowed in other sections. One example is in Section 20-27 (2), which  
21 states that damage inflicted to or cutting upon a tree which permits infection or pest  
22 infestation is tree abuse. This is not applicable in practice, because *any* pruning or  
23 trimming cuts on a tree remove the bark and leave open wounds through the woody  
24 tissue that can permit infection or pest infestation. Thus, read literally, Section 20-27

1 (2) would not permit any arboricultural pruning or trimming even though the clear  
2 intent of Article II of the NM Code is to permit controlled pruning and trimming. A  
3 second example is Section 20-27 (3), which states that cutting upon any tree which  
4 destroys the natural shape is tree abuse. This directly conflicts with the statements in  
5 Section 20-23 allowing for pruning or trimming of tree canopies. All trimming and  
6 pruning changes the natural shape of a tree. Again, a literal reading of this section  
7 would conflict with the intent of Article II to permit controlled pruning and trimming.  
8 The FPL VM work in the City of North Miami, as inspected, does comply with the  
9 NM Code.

10  
11 In conclusion, FPL has identified the relevant standards of practice and legal codes  
12 correctly in their VM guidelines for work. These standards and codes have been used  
13 for writing guidelines and specifications for VM work. The work completed by FPL  
14 VM in the City of North Miami is in compliance with all the applicable standards and  
15 codes researched for this review.

16  
17 **FPL'S VM WORK WITHIN THE CITY**

18 **Q: Please describe the field inspection you performed of FPL's VM work within the**  
19 **City.**

20 **A:** Using circuit maps of distribution lines within the City provided to me by William  
21 Slaymaker of FPL, I selected specific circuits where VM work was completed in  
22 2006. I then went to those areas of the City and drove the streets where these circuits  
23 are located, looking for trees that showed recent pruning or trimming work. From this  
24 survey, I chose locations for my review based on the presence of trees that had

1 significant canopy trimmed for electric line clearance, since this is the main issue of  
2 concern presented in testimony by the City of North Miami.

3 **Q: What did you observe for the trimming done to the trees in these locations?**

4 A: These trees were along public streets and were either under or adjacent to the electric  
5 lines. Because of their location, the trees could have been trimmed for 1 or more of 3  
6 purposes: (1) electric line clearance, (2) road or right-of-way clearance, and (3) by  
7 property owners for aesthetic reasons. Some of the trees I observed had been  
8 trimmed for 2 or all 3 of these purposes. The results of my inspections can be most  
9 easily understood by looking at the photographs in Exhibit JAH-1. I have included a  
10 caption under each of the photographs that explains what it shows about trimming  
11 practices and the photograph's significance to my testimony. As discussed in the  
12 captions, the photographs show that FPL has consistently trimmed trees properly  
13 according to industry standards and codes. Trimming done by other entities for other  
14 purposes, to the same trees or others in certain locations, does not comply with the  
15 applicable standards or codes, and has resulted in damage to the health of trees. The  
16 additional work has contributed to them being viewed as unattractive or overpruned.

17

18 **Q: Can you restate your conclusions about FPL's VM practices within the City?**

19 A: Based on my observations, it appears that FPL's tree trimming in the City  
20 consistently complies with the NM Code, the M-DC Code, and the ANSI A-300  
21 standards, including both arboricultural practices and public safety sections.

22

1 **Q: Mr. Lytle expressed concern in his testimony that “FPL crews just go in there**  
2 **and illegally trim a tree, they cut too much off, ..., and it violates a lot of**  
3 **standards.” Based on your review, did you see evidence to support his concern?**

4 A: No. I found no evidence of illegal trimming by FPL within the City. The applicable  
5 standards allow FPL latitude to trim to meet public safety standards and electrical  
6 safety standards. This is what I saw consistently in my inspection. I should also note  
7 that there was storm recovery work done in the City during 2004 and 2005, due to  
8 both severe rain storms and hurricanes, and some trees showed results of trimming for  
9 storm recovery work. As discussed in the testimony of FPL witness William  
10 Slaymaker, this is specifically envisioned and permitted under ANSI A-300 and the  
11 applicable legal codes.

12 **Q: Mr. Lytle also expressed concern over the use of “drop-crotch cuts.” Is FPL**  
13 **permitted to make drop-crotch cuts in the City?**

14 A: Yes. It is an accepted form of utility pruning identified in the standards, and FPL is  
15 allowed by the codes to do this type of trimming, even if it removes more than 1/3 of  
16 the canopy.

17

18 **OVERALL ADEQUACY OF FPL’S VM PROGRAM**

19 **Q. What do you conclude about the adequacy of FPL’s VM practices generally?**

20 A: As an electric utility, FPL is tasked to trim trees to provide electrical safety at a  
21 reasonable cost to its customers. Based on my direct observations of FPL’s VM  
22 practices, review of the other utilities’ submittals to the Commission, and my many  
23 years of experience with utility VM, I believe that FPL does a better job of VM than  
24 most of the electric utilities in the United States.

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There are many trees within the City and elsewhere that would be best removed from the proximity of electric lines, rather than trimmed for line clearance. FPL has an award winning program named "Right Tree, Right Place" to help educate the public on this issue. However, in many instances, it is not the utility's decision to require removal of inappropriate trees. In many instances where inappropriate trees are located near electric lines, the property owner and the agency with local jurisdiction (in this case the City of North Miami) have the right to require a tree to be left in place. This requires more severe canopy removal to be performed to provide for line clearance. In my opinion, if a tree is required to be left in place, the proper course of action for an electric utility is to do the necessary line clearing to meet public safety and line clearance distances. If trees are potentially, or actually, causing electrical power interruptions, it is most important to get the necessary line clearance; regardless of the final appearance of the tree canopy.

This priority, given to public and electric safety, is recognized in the industry standards as well as local ordinances and codes. If additional tree trimming would help the aesthetics of a particular tree, then the tree should be pruned by a qualified professional arborist at the property owner's expense, once the canopy has been cleared beyond the minimum electrical safety distances. Another option is for a property owner to choose for the tree to be safely removed at their expense once it has been cleared of the electrical lines; and to only plant vegetation in that location that is compatible in mature growth with the location of utility lines. Reducing utility line

1           conflicts with vegetation is most cost effective when there is no vegetation to grow  
2           into the lines.

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5   **Q:   Please summarize your testimony.**

6   A:   The work completed by FPL VM in the City of North Miami does comply with the  
7       industry standards and legal codes that are applicable. In locations where trees  
8       trimmed for line clearance may be considered unattractive, or overpruned, there may  
9       be other tree trimming that was done by others contributing to this problem. The  
10      standards and codes allow for FPL to be concerned about electrical safety and  
11      reliability beyond the amount of canopy removed in a tree. The concerns raised by the  
12      City of North Miami regarding the work done by FPL VM need to be viewed in light  
13      of the applicable standards and codes, as has been presented in my testimony.

14   **Q.   Does this conclude your direct testimony?**

15   A:   Yes.





**Inspection Photo Pages**

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The following are photographs taken during an independent inspection of work done by FPL VM in the City of North Miami. Work by FPL was done within last 1-2 years based on review of the condition of cuts and work records provided by FPL. The inspection was done on December 13, 2006 by John Harris, Landscape Economist, with Darlene Harris, professional photographer, assisting with the photography.



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Photo 1: Live Oak tree in center median of NE 8 Avenue, on the south side of corner of NE 8 Avenue and NE 119 Street in North Miami, Florida. Live Oak was trimmed for line clearance in upper canopy and for road clearance in lower canopy. See old pruning cut for road clearance in center of photo (dark cut wound with callous wood surrounding cut), and new stub cut at right side of tree canopy approximately directly over the head of John Harris. The re-growth of canopy in the upper canopy is a natural response to the level of trimming done to V cut, or directionally prune, this tree away from electric lines overhead (3 phase feeder lines). Approximately 30% of the canopy was removed for line clearing, and 10% of the canopy for road clearance. The trimming done for line clearance appears to have been done in compliance with applicable codes, regulations and standards. In contrast, the trimming for road clearance did not follow the applicable standards because it left the large stub cut.



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2 Photo 2: A *Ficus benjamina* tree that has been trimmed for line clearance, for road  
3 clearance, and by the property owner for driveway clearance and size/shape. This tree is  
4 on the south side of the T intersection for NE 12 Avenue and NE 107/108 Street in North  
5 Miami, Florida. It is on the west side of the residence's driveway. This species is exempt  
6 from trimming or pruning standards in the City of North Miami. The aesthetic value of  
7 this tree is low, and it could be one of the trees that are referenced by the City of North  
8 Miami Direct Testimonies. Approximately 25-35% of the canopy was removed for line  
9 clearance, 10-15% for road clearance, and 20-35% for driveway clearance and shaping,  
10 for a total canopy removed of 55-65% for this tree (there is some overlap of canopy  
11 removal percentages among trimmers). This tree is an example for trees that would be  
12 better to remove than maintain by trimming; due to costs for all three entities and the  
13 appearance of the tree today. The trimming done for line clearance appears to have been  
14 done in compliance with applicable codes, regulations and standards (including the  
15 City's, even though *Ficus benjamina* are exempt). The additional trimming for road  
16 clearance and by the property owner is the main cause for the imbalanced canopy  
17 appearance shown in the photograph.  
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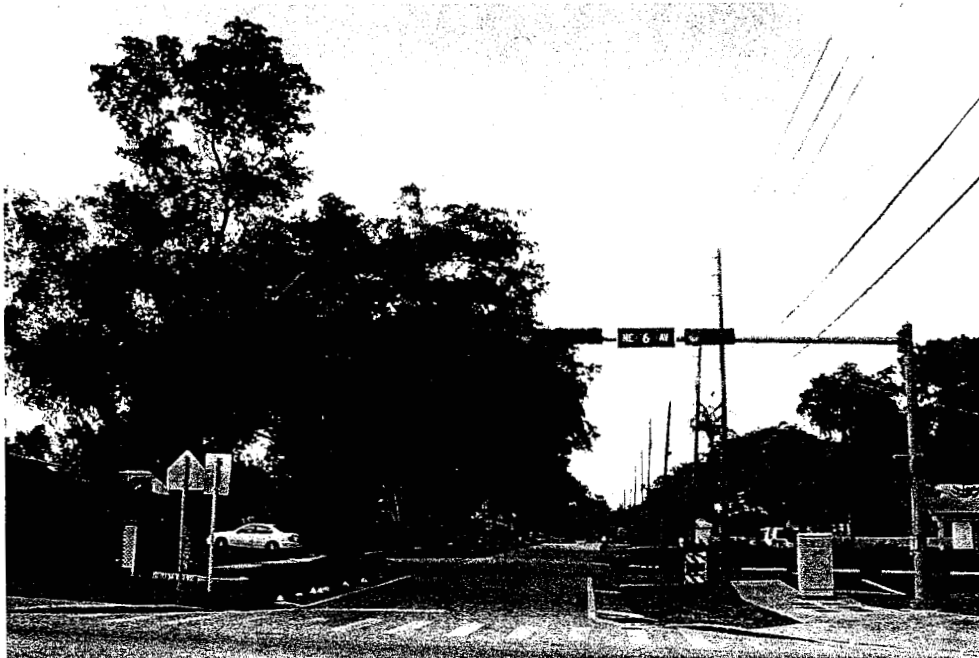
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2 Photo 3: A second *Ficus benjamina* tree at same location, to east of driveway. This tree is  
3 showing decline from the major leaders removed by property owner for driveway  
4 clearance. It may need removal within the next few years due to decline and rot in the  
5 main leaders and trunk of the tree. This tree, due to declining health condition and the  
6 location near the road and utilities, would be considered a Risk Tree by the tree  
7 evaluation standards of the International Society of Arboriculture. The decline in health  
8 is mainly due to the additional trimming for driveway clearance and/or road clearance,  
9 which removed approximately 35-50% of the canopy. The line clearance trimming  
10 removed approximately 30-35% of the canopy, which is within the applicable standards.  
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2 Photo 4: A Black Olive tree (left side of photo) that was trimmed for line clearance and  
3 Live Oak tree (right side of photo) that was trimmed or hatracked by property owner or  
4 their contractor. Trees are in residential front yard and Right-of-Way at NW of corner of  
5 NE 11 Place and NE 123 Street. A dead smaller/younger Black Olive tree is in center of  
6 photo and is in west side Right-of-Way on NE 11 Place. The larger Black Olive to left  
7 side was V cut for line clearance by FPL. The trimming of the larger Black Olive for line  
8 clearance appears to have been done in compliance with applicable codes, regulations  
9 and standards, with re-growth of the canopy following the directional pruning  
10 expectations. In contrast, the hatracking of the Live Oak cut back every leader on the  
11 Live Oak to large (approximately 6-10 inch diameters) diameter stubs that have sprouted  
12 reactionary growth with rotting wood seen at cut points. This is inconsistent with  
13 accepted guidelines and, probably as a result, the Live Oak is showing signs of decline  
14 with chlorotic colored foliage and less foliage in canopy than desirable for health of this  
15 size tree (amount of live woody tissue). In contrast, the Black Olive trimmed for line  
16 clearance shows regrowth of canopy and healthier colored foliage. The dead Black Olive  
17 in center of photo is not under or within clearance distances of electric lines.  
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2 Photo 5: Closeup of the upper canopy of the Live Oak from Photo 4, showing the cut  
3 ends and conditions of canopy from hatracking.  
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6 Photo 6: Looking west from the corner of NE 6 Avenue and NE 107 Street, the north side  
7 of the street has a 3 phase feeder line, with only smaller maturing trees planted under the  
8 lines (a Crape Myrtle is under the lines). The south side of the street is planted with Black  
9 Olive trees that provide canopy and shade to the road and properties. This is an example  
10 of good planning for continued utility reliability based on keeping trees outside a  
11 potential conflict with the overhead lines.  
12

1 There are additional locations inspected and additional photographs from the inspection  
2 visit. The photographs here represent the most extreme examples for trees that were  
3 trimmed for utility line clearance, roadway clearance, or by property owners (or their  
4 contractors). It was my intention to reduce the amount of materials for review by  
5 choosing to show trees that represent appearances that are complained about in the City  
6 of North Miami Direct Testimonies, with answers to resolve those complaints.





**ANSI A300 (Part 1)-2001 Pruning**  
Revision of ANSI A300-1995

**American National Standard**

*for Tree Care Operations —  
Tree, Shrub, and Other Woody Plant  
Maintenance —  
Standard Practices (Pruning)*

*ANSI A300 (Part 1)-2001 Pruning*  
Revision of ANSI A300-1995



ANSI®  
A300 (Part 1)-2001  
Revision of  
ANSI A300-1995

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

Secretariat  
**National Arborist Association, Inc.**

Approved May 22, 2001  
**American National Standards Institute, Inc.**  
Headquarters:  
1819 L Street, NW  
Sixth Floor  
Washington, DC 20036  
New York Office:  
25 West 43rd Street  
Fourth Floor  
New York, NY 10036

AMERICAN NATIONAL STANDARD

ANSI A300 (Part 1)-2001 Pruning

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 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.

**2 Part 1 – Pruning standards**

**2.1 Purpose**

The purpose of this document is to provide standards for developing specifications for tree pruning.

**2.2 Reasons for pruning**

The reasons for tree pruning may include, but are not limited to, reducing risk, maintaining or improving tree health and structure, improving aesthetics, or satisfying a specific need. Pruning practices for agricultural, horticultural production, or silvicultural purposes are exempt from this standard.

**2.3 Safety**

**2.3.1** Tree maintenance shall be performed only by arborists or arborist trainees who, through related training or on-the-job experience, or both, are familiar with the practices and hazards of arboriculture and the equipment used in such operations.

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

**2.3.3** Operations shall comply with applicable Occupational Safety and Health Administration (OSHA) standards, ANSI Z133.1, 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, *Tree care operations - Pruning, trimming, repairing, maintaining, and removing trees, and cutting brush - Safety requirements*

29 CFR 1910, *General industry*<sup>1)</sup>

29 CFR 1910.268, *Telecommunications*<sup>1)</sup>

29 CFR 1910.269, *Electric power generation, transmission and distribution*<sup>1)</sup>

29 CFR 1910.331 - 335, *Electrical safety-related work practices*<sup>1)</sup>

**4 Definitions**

**4.1** *anvil-type pruning tool*: A pruning tool that

ANSI A300 (Part 1)-2001 Pruning

**5.7.4 Restoration**

**5.7.4.1** Restoration shall consist of selective pruning to improve the structure, form, and appearance of trees that have been severely headed, vandalized, or damaged.

**5.7.4.2** Location in tree, size range of parts, and percentage of watersprouts to be removed should be specified.

**5.7.5 Vista pruning**

**5.7.5.1** Vista pruning shall consist of selective pruning to allow a specific view.

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

**5.8 Palm pruning**

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

**5.8.2** Live healthy fronds, initiating at an angle of 45 degrees or greater from horizontal with frond tips at or below horizontal, should not be removed.

**5.8.3** Fronds removed should be severed close to the petiole base without damaging living trunk tissue.

**5.8.4** Palm peeling (shaving) should consist of the removal of only the dead frond bases at the point they make contact with the trunk without damaging living trunk tissue.

**5.9 Utility pruning**

**5.9.1 General**

**5.9.1.1** The purpose of utility pruning is to prevent the loss of service, comply with mandated clearance laws, prevent damage to equipment, avoid access impairment, and uphold the intended usage of the facility/utility space.

**5.9.1.2** Only a qualified line clearance arborist or line clearance arborist trainee shall be assigned to line clearance work in accordance with ANSI Z133.1, 29 CFR 1910.331 – 335, 29 CFR 1910.266 or 29 CFR 1910.269.

**5.9.1.3** Utility pruning operations are exempt from requirements in 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.*

**5.9.1.4** Safety inspections of the work area are required as outlined in ANSI Z133.1 4.1.3, job briefing.

**5.9.2 Utility crown reduction pruning**

**5.9.2.1 Urban/residential environment**

**5.9.2.1.1** Pruning cuts should be made in accordance with 5.3 Pruning cuts. The following requirements and recommendations of 5.9.2.1.1 are repeated from 5.3 Pruning cuts.

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

**5.9.2.1.1.2** A pruning cut that reduces the length of a branch or parent stem should bisect the angle between its branch bark ridge and an imaginary line perpendicular to the branch or stem (see Figure 5.3.3).

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

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

**5.9.2.1.1.5** 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 pre-cut 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.

**5.9.2.1.1.6** A final cut that removes a branch

**ANSI A300 (Part 1)-2001 Pruning**

with a narrow angle of attachment should be made from the bottom of the branch to prevent damage to the parent limb (see Figure 5.3.7).

**5.9.2.1.2** A minimum number of pruning cuts should be made to accomplish the purpose of facility/utility pruning. The natural structure of the tree should be considered.

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

**5.9.2.1.4** 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 waterprouts that would grow into facilities and/or utility space should be removed.

**5.9.2.1.5** 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.

**5.9.2.2 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.

**5.9.3 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 1910.268, or 29 CFR 1910.269. 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.



Exhibit JAH-3 -- Miami-Dade County Tree Preservation Code  
Note: Verbatim as written in current code book and MuniCodes website

**MIAMI DADE COUNTY CODE**

**Sec. 8AA-159. Location/Relocation of Facilities.**

...

(d) Provider shall have the authority to trim trees upon or overhanging streets, alleys, sidewalks and public ways and places of the County so as to prevent the branches of such trees from coming in contact with the wires and cables of the Provider, in a manner approved by and acceptable to the County. When the County determines such trimming is necessary to protect the health safety and welfare of the public, such trimming may be done by it or under its supervision and direction at the expense of the Provider, if prior notification has been given to the Provider and the Provider thereafter failed to respond.

**Sec. 18A-11. Landscape maintenance.**

(A) An owner is responsible to ensure that landscaping required to be planted pursuant to this chapter, or the ordinances which were in effect prior to the effective date of this chapter, is: (1) installed in compliance with the Landscape requirements; (2) maintained as to present a healthy, vigorous, and neat appearance free from refuse and debris; and (3) sufficiently fertilized and watered to maintain the plant material in a healthy condition.

(B) If any tree or plant dies which is being used to satisfy current landscape code requirements, such tree or plant shall be replaced with the same landscape material or an approved substitute.

(C) Trees shall be pruned in the following manner:

(1) All cuts shall be clean, flush and at junctions, laterals or crotches. All cuts shall be made as close as possible to the trunk or parent limb, without cutting into the branch collar or leaving a protruding stub.

(2) Removal of dead wood, crossing branches, weak or insignificant branches, and sucker shall be accomplished simultaneously with any reduction in crown.

(3) Cutting of lateral branches that results in the removal of more than one-third (1/3) of all branches on one (1) side of a tree shall only be allowed if required for hazard reduction or clearance pruning.

(4) Lifting of branches or tree thinning shall be designed to distribute over half of the tree mass in the lower two-thirds (2/3) of the tree.

(5) No more than one-third (1/3) of a tree's living canopy shall be removed within a one (1) year period.

(6) Trees shall be pruned according to the current ANSI A300 Standards and the Landscape Manual.

(Ord. No. 95-222, § 2, 12-5-95; Ord. No. 98-13, § 1, 1-13-98)





Exhibit JAH-4 -- City of North Miami Landscape Standards and Tree Preservation Codes  
Note: Verbatim as written in current code book and MuniCodes website

## CITY OF NORTH MIAMI CODE

### ARTICLE II. TREES

#### Sec. 20-15. Definitions.

The following words, terms and phrases, when used in this article, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

*Dripline* means the natural outside end of the branches of a tree or shrub projected vertically to the ground.

*Equivalent replacement* means a tree which due to condition, size and location is determined by a city representative to be equivalent to the tree to be removed.

*Equivalent value* means an amount of money which reflects the replacement cost of a tree based on size, condition, location and market value.

*Hatracking* means to uniformly remove the major part of the tree's crown reducing it in height and leaving a number of large bare limbs, characterized by a number of stubbed off branches.

*Prune* means to cut away, remove, cut off or cut back parts of the tree or plant which will alter the natural shape.

*Tree* means any self supporting woody or fibrous perennial plant, possibly shrubby when young, which has a trunk diameter of at least one (1) inch measured four and one-half (4 1/2) feet above grade usually with one (1) main stem or trunk and a more or less distinct and elevated head with many branches.

*Tree abuse* means any action which does not follow acceptable trimming practices as established by the National Arborist Association.

*Tree services/arborist* means any person, company, corporation or service which for compensation or a fee, transplants, removes, prunes, trims, repairs, injects or performs surgery upon a tree, whether or not in addition to other services.

*Trim* means to reduce, shorten or diminish a plant or parts of a plant without altering the natural shape or growth characteristics.

(Code 1958, § 27-1)

#### Sec. 20-16. Applicability

(a) The regulations contained in section 20-21, pertaining to relocation, replacement and donation, shall apply to all undeveloped property, and developed multifamily, commercial and industrial property.

(b) The regulations contained in section 20-23, pertaining to tree trimming standards, and section 20-27, pertaining to tree abuse, shall not apply to city property owners or tenants. These standards shall apply to tree services/arborists or other contractors performing tree-related work on nonexempted trees.

(c) Except as exempted in this section, the terms and provisions of this article, shall apply to all real property within the city.

(d) Specifically exempt from the terms and provisions of this article are the following species of trees: *Ricinus communis* (castorbean); *Psidium guajava* (guava); *Schinus terbinthinifolius* (Brazilian pepper tree); *Aibezzia lebbek* (woman's tongue); *Metropium toxiferum* (poison wood); *Malaleuca leucadendra* (malaleuca); *Bischofia javanica* (bishop wood); *Casuarina equisetifolia* (Australian pine); *Brassia actino-phylla* (schefflera); *Ficus benjamina* (fig); *Ficus elastica* (rubber tree plant or fig); *Ficus anura* (fig); *Araucaria heterophylla* (Norfolk Island pine); and *Euphorbia tirucalli* (pencil tree) provided that removal along canal banks of those species of trees as set forth in this subsection shall be governed by section 20-21.1 of this article.  
(Code 1958, § 27-1; Ord. No. 926, § 1, 11-22-94)

Sec. 20-17. Enforcement.

This article shall be subject to enforcement by the local Code Enforcement Boards Act, F.S. chapter 162, as amended, through the city code enforcement board. Enforcement may also be by suit for declaratory, injunctive or other appropriate relief in a court of competent jurisdiction.  
(Code 1958, § 27-13)

Sec. 2-18. Permit for removal--Required.

It shall be unlawful for any person, directly or indirectly, to cut down, destroy, remove or move, effectively remove through damaging, any tree within the city without first obtaining a permit to do so as provided in this article.  
(Code 1958, § 27-2)

Sec. 2-19. Same--Application.

(a) *Application not in conjunction with building permit.* Any person wishing to remove any tree not exempted by section 20-16, shall file an application with the department of community planning and development on a form provided therefor. The application shall include the reasons for removal and be accompanied by a site plan drawn to scale no smaller than one (1) inch equals sixteen (16) feet indicating the location, the size in estimated height and trunk circumference at four and one-half (4 1/2) feet aboveground, and the common name of the tree to be removed.

(b) *Application in conjunction with building permit.* Any person wishing to remove any tree defined in section 20-15 in conjunction with development for which a building permit is required, shall file an application with the department of community planning and development on a form provided therefor. The application shall include the reasons for removal and be accompanied by:

(1) A certified survey of the property showing:

a. Location of all existing improvements, property lines, setback lines, walls and fences, and other planned areas or structures on the site;

b. The location, size in estimated height and trunk circumference at four and one-half (4 1/2) feet aboveground and common name of all trees with a designation of all diseased trees and any trees endangering any roadway and pavement or utility lines.

(2) A site plan drawn to scale no smaller than one (1) inch equals sixteen (16) feet indicating:

- a. Designation of those trees to be removed, retained, moved to another location on site, and proposed location of new trees;
- b. Proposed grade changes due to flood criteria fill requirements, or grade changes resulting from the proposed site development, which might adversely affect or endanger any trees on the site.

(3) No building permit shall be issued until the site plan required by this section has been reviewed and approved by the building division.

(4) No certificate of occupancy shall be issued until tree replacement, relocation or monetary donation, if required, has been accomplished.

(Code 1958, § 27-3);

#### Sec. 20-20. Same--Issuance.

(a) On receipt of an application, the site shall be field checked by a representative of the department of community planning and development. The city engineer shall review the application to determine what effect it will have upon the drainage, topography, and the natural resources of the area. Based upon a review of the above factors, and conditions set forth below, the permit shall either be granted or denied by the department of community planning and development of the city.

(b) No permit shall be issued for the cutting down or removal of any tree unless one (1) of the following findings is made:

- (1) The location of the tree unreasonably restricts the beneficial use of the property;
- (2) The location of the tree is in the portion of the site where a structure is proposed, and the relocation of the structure is not feasible or possible;
- (3) The condition of the tree with respect to disease, danger of falling, proximity to existing or proposed structures, or interference with overhead or underground utility service including but not limited to lawful septic tanks, is such that it is in the furtherance of the public health or safety to permit its removal.

(Code 1958, § 27-4)

#### Sec. 20-21. Relocation, replacement, donation.

Except for an application to remove a tree pursuant to subsection 20-20(3), as a condition for approval of an application for removal, the department of community planning and development will allow the applicant to choose one (1) of the following options:

- (1) Relocate the tree on the site or to another location within the city, and guarantee its survival for a period of one (1) year;
- (2) Plant and maintain an equivalent replacement on the site;
- (3) Donate an equivalent replacement to the city, plant it on public property and provide a one (1) year survival guarantee;
- (4) Replace the tree with an equivalent value donation plus an amount equal to the value of the tree multiplied by two (2), to cover the average costs of transportation, installation and tree establishment.

(Code 1958, § 27-5; Ord. No. 951, § 1, 9-26-96)

Sec. 20-21.1. ...

Sec. 20-22. ...

Sec. 20-23. Trimming standards.

(a) Tree trimming shall follow acceptable trimming practices as established by the National Arborist Association and shall be consistent with the following standards:

(1) All cuts shall be clean, flush and at junctions, laterals or crotches. Tunneling or drop crotch trimming for overhead utility lines shall be followed.

(2) Removal of dead wood, crossing, branches, weak or insignificant branches shall be accomplished simultaneously with any reduction in crown.

(b) A deviation from the above practices and standards shall not be construed to violate this section to the extent such deviation is directly necessitated by the close proximity of the subject tree to a house, building or other similar structure.

(Code 1958, § 27-7)

Sec. 20-24. ...

Sec. 20-25. Public property.

No tree on public property shall be removed except as required by the City of North Miami.

(Code 1958, § 27-11)

Sec. 20-26. Emergencies.

If any tree is determined to be in hazardous or dangerous condition so as to endanger the public health, welfare, or safety, and requires immediate removal without delay, verbal authorization by phone may be given by the director of the department of community planning and development, the director of the parks and recreation department, or the city manager, and the tree removed without obtaining a written permit as required by this article. In the case of emergencies such as a hurricane or other disaster, the requirements of this article may be waived by the city manager during this period.

(Code 1958, § 27-12)

Sec. 20-27. Tree abuse--Prohibited; defined.

Tree abuse is prohibited. Abused trees may be required to be replaced. Tree abuse includes:

(1) Damage inflicted upon any part of a tree, including the root system, by machinery, mechanical attachment, storage of materials, soil compaction, excavation, vehicle accidents, chemical application or change to the natural grade;

(2) Damage inflicted to or cutting upon a tree which permits infection or pest infestation;

(3) Cutting upon any tree which destroys the natural shape;

(4) Hatracking;

(5) Bark removal more than one-third of the tree diameter measured four and one-half (4 1/2) feet aboveground;

(6) Tears and splitting of limb ends or peeling and stripping of bark;

(7) Use of climbing spikes.

(Code 1958, § 27-8)



# Best Management Practices

## UTILITY PRUNING OF TREES

Geoffrey P. Kempter

Special companion publication to the ANSI A300 Part 1: Tree, Shrub, and  
Other Woody Plant Maintenance—Standard Practices, Pruning



remove a branch over more than one pruning cycle rather than all at once. Subsequent pruning may also require cutting to lateral or less than recommended size, but only as a temporary measure.

#### **Directional Pruning**

Directional pruning is accomplished by pruning unwanted branches back to lateral branches or point stems that are growing away from the facility (Figure 9). These lateral branches should be of sufficient size to become dominant, thus discouraging the growth of sprouts. This method is often referred to as *drop-crotching* or *neutral pruning*. Directional pruning is most effective when natural tree characteristics such as size, shape, and expected growth rate are taken into consideration. It also is important to understand the effect of other factors, such as apical dominance, on expected tree response to pruning.

Apical dominance is the suppression of lateral buds (located along the sides of branches) by terminal buds (found at branch tips). When terminal buds are removed, sprout dominance is reduced. The tree increasingly sprouts from lateral buds as a result, which is why trees respond with vigorous sprout growth when they are severely headed or rounded over. Directional pruning achieves as many terminal buds as possible, leading to less vigorous sprouting from lateral buds.

The effect of directional pruning on the shape of the tree depends on the tree's natural growth habit and where the tree is relative to the facility. Trees growing directly beneath facilities assume a different shape than trees growing beside them (Figure 10). Removal of overhanging limbs may or may not be appropriate, depending on the type of facility, tree species, or other site conditions (Figure 11).

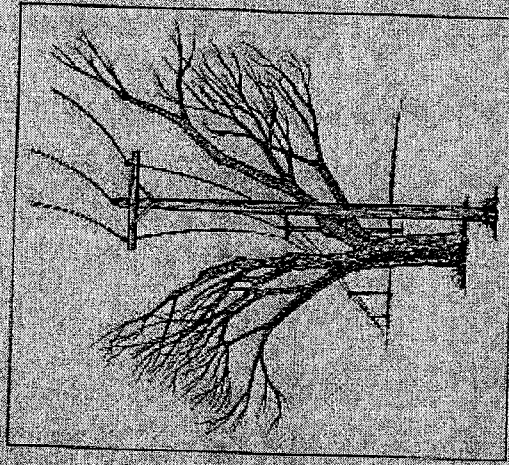


Figure 9. Directional pruning (also known as neutral pruning) encourages growth away from existing lines.

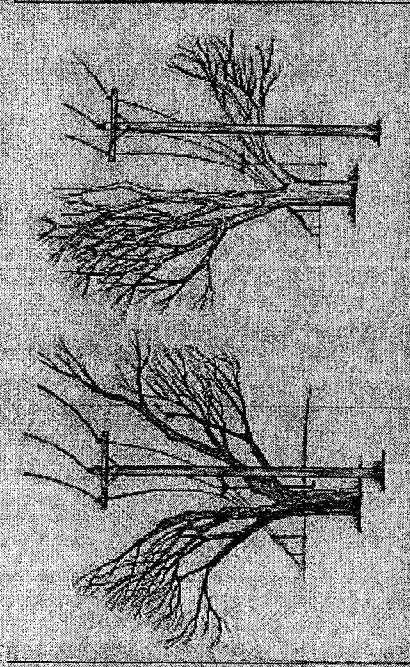
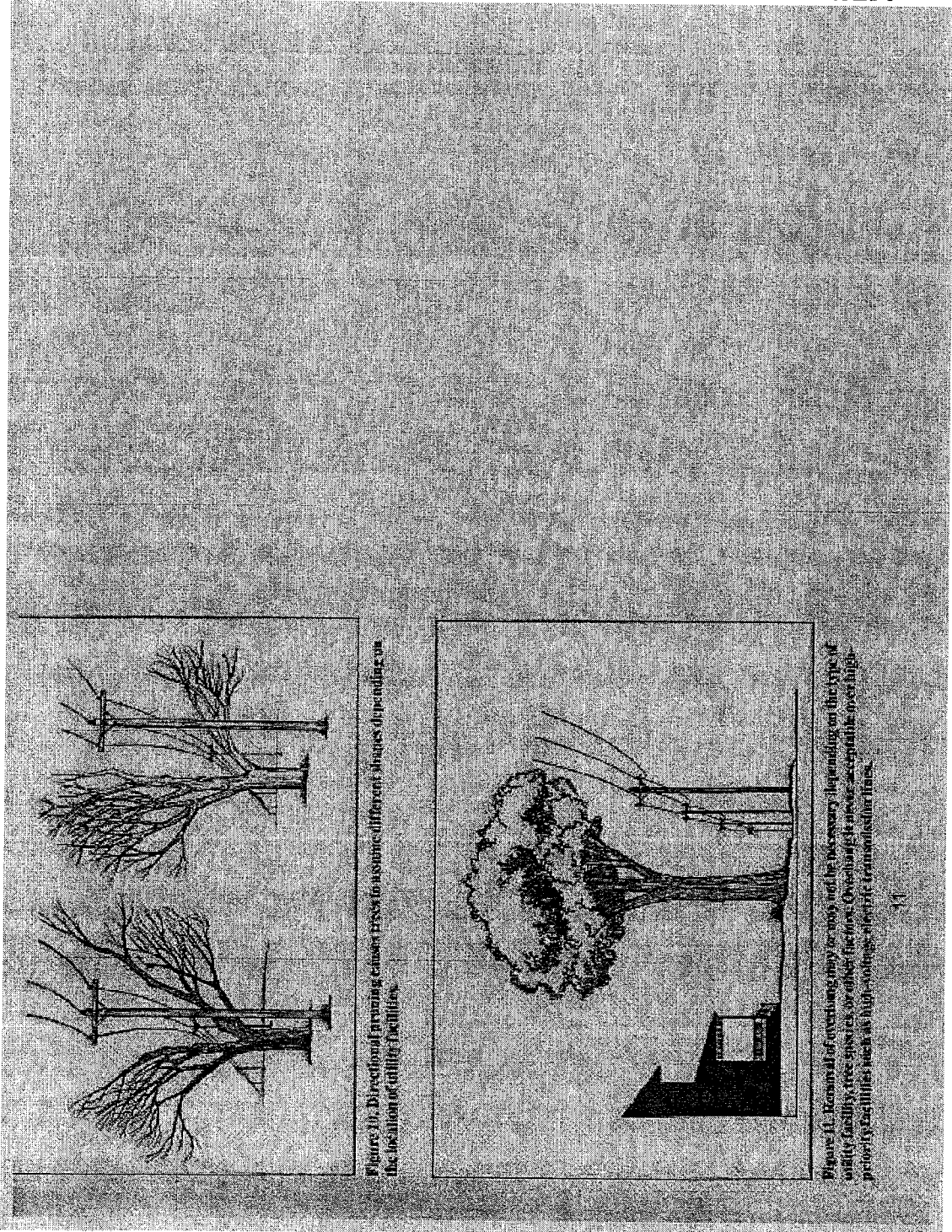


Figure 10. Directional pruning causes trees to assume different shapes depending on the location of utility facilities.

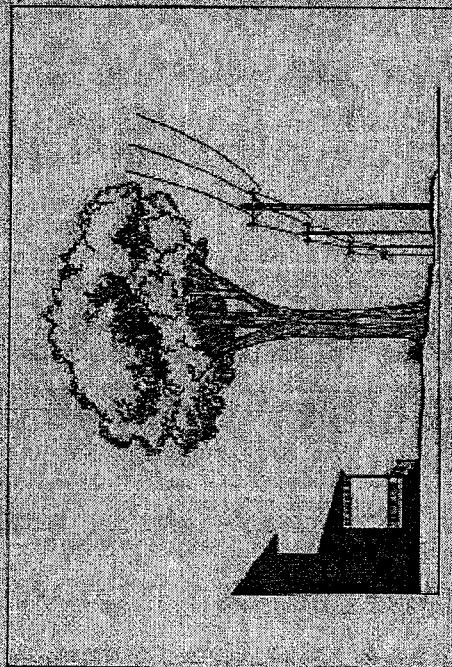


Figure 11. Minimal of overhang may or may not be necessary depending on the type of utility facility, tree species, or other factors. Overhang is more acceptable over high-voltage facilities such as high-voltage electric transmission lines.



Unfortunately, trees do not always have sufficiently large-lateral branches, growing in the right direction, to assure dominance. Large trees with an excurrent, or upright, growth habit that are growing directly beneath a facility often pose this dilemma. If these trees are to be retained, it may be necessary to prune the smaller laterals in order to obtain the required clearance. Whenever practical, such trees should be removed and, if appropriate, replaced with compatible species.

#### *Pre-Established Clearing Limits*

Many pruning specifications require a minimum clearance between tree branches and utility facilities. If used, such pre-established clearing limits should allow for variables such as:

- tree species characteristics
- expected growth rate
- natural tree structure
- expected reaction to pruning
- wood strength
- overall tree health
- length of time until next scheduled pruning
- type of facility (voltage, construction type, etc.).

Factors such as the presence of other trees, buildings, terrain, and other site features also contribute to the shape or growth patterns of trees and should be taken into account when obtaining clearances.

Utility arborsists should be familiar with the characteristics of trees in the areas where they work and should obtain clearances accordingly. For example, more clearance may be necessary on fast-growing or weak-stemmed trees. When minimum clearances are required, pruning cuts should be made at the next suitable lateral or parent limb beyond the specified distance whenever practical (see Figure 8).

#### *Rounding Over and Snubbing Cuts*

Rounding over or *topping* is the now discredited practice of indiscriminately snubbing the entire crown of a tree (Figure 12). In this process, a series of heading cuts are made between lateral branches, rather than at the lateral. This once widespread practice is now considered unacceptable because it severely damages trees and encourages rapid re-growth. Many tree species respond to heading, topping, rounding over or other severe treatments with a flush of fast-growing sprouts, which can rapidly overtake conductors (Figure 13).

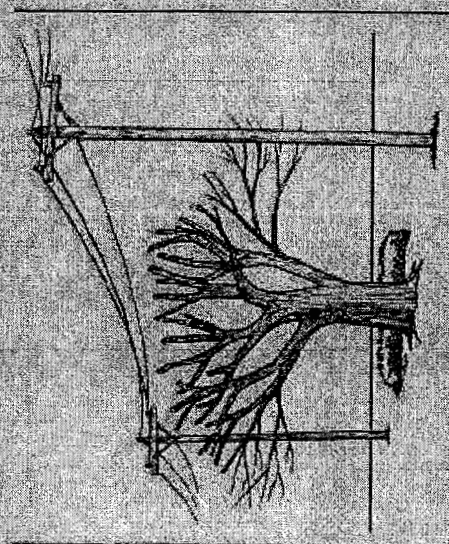


Figure 12. Rounding over, topping, or stubbing severely damages trees and is now a discredited practice.

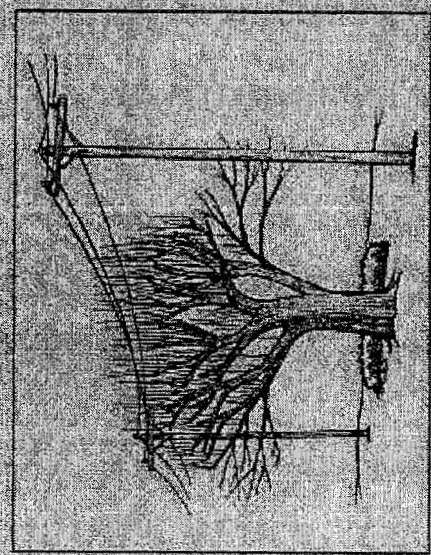


Figure 13. More trees required to maintain cover of thick bush of light growing sprouts already back over the electric facilities.



Trees sprout heavily following rounding over or severe pruning and produce rapid new growth, often right back into the area in which it is least desirable. In addition, repeated rounding over depletes food stores, weakens trees, and increases susceptibility to insect, disease, and fire. In contrast, directional pruning cuts to terminals, which removes only what is necessary, protects tree health, and more effectively clears the facility.

#### *Pollarding*

Pollarding is an established pruning method that maintains certain species of trees and shrubs at a predetermined size by systematically removing annual growth. Many people mistakenly refer to this indiscriminate rounding over and heading of trees to reduce their size as *pollarding* (Figure 14).

True pollarding is a careful and delicate process. It is accomplished by making strategically placed heading cuts, after which all new shoots are carefully removed

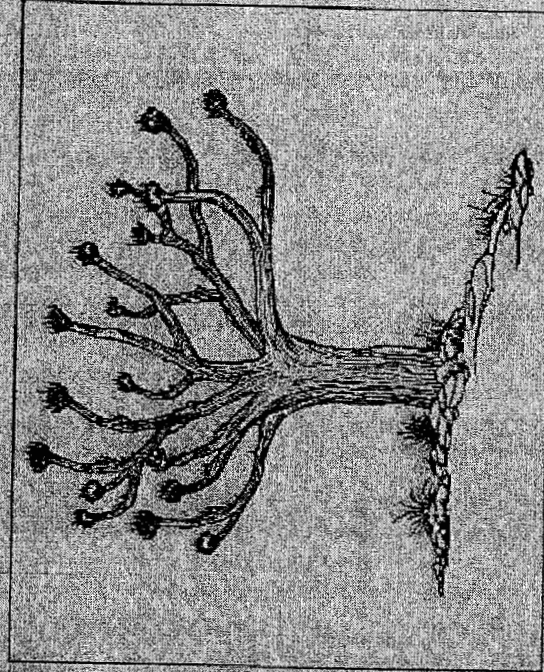


Figure 14. The practice of pollarding requires annual removal of all apical growth, with the intention of the woody stems that occur at the nodes of branches. Rounding over or stubbing is not the same as pollarding. Pollarding is generally not practical under utility facilities.

of the original cuts. For more information on pollarding, refer to *IS-110: Pollarding Practices, Tree Pruning* (published by ISA).

Though pollarding is effective in controlling the size of certain tree species, the required frequency of pruning and accompanying cost make routine use of this method impractical along utility corridors.

### Tree Response to Utility Pruning

Following pruning, the amount of sprout growth is determined by a number of factors, including:

- **Species:** Some tree varieties, such as sycamores (*Platanus* spp.), cottonwood (*Populus* spp.), certain maples (*Acer* spp.), Linden (*Tilia* spp.), and others are known for prolific sprouting following pruning.
- **Pruning method:** Trees cut back to available lateral sprouts less than trees that are rounded over, headed back, or pruned to laterals too small to assume dominance.
- **Vitality:** Trees in good health, with plenty of stored reserves, are likely to respond with vigorous growth, often in the form of sprouts. Severely stressed trees may also invest their last reserves in heavy sprout growth.
- **Amount removed:** The larger the percentage of crown removed, the stronger the expected growth response from a vigorous tree.

### Cycle Pruning

Pruning for clearance is performed on a regular, cyclical basis. Cycle pruning has many demonstrable advantages, including enhanced utility reliability, reduced biological and aesthetic impact on trees and neighborhoods, and stabilized or reduced tree maintenance budgets. To allow for variation in tree-growth rates among different species, clearance distances should be recommended for individual species based on expected growth rates.

Cycle length is the amount of time between scheduled pruning operations. The cycle length should be established to ensure that tree growth will not overtake utility facilities prior to the next scheduled pruning. The optimal pruning cycle length is determined by the amount of clearance that can realistically be obtained as well as the expected growth rates of the trees present. Maintenance cycles generally are shorter in areas with long growing seasons or with a high percentage of fast-growing tree species. Likewise, in areas with short growing seasons or many slow-growing tree species, maintenance cycles can be longer.



## Emergency Service Restoration

### Threat from Storms

Extreme weather, such as high winds of ice storms, often causes tree failures, which may severely impact utility facilities. Storms can be local events or can affect entire regions. The level of threat depends on the probability of severe weather occurring in an area, the tree density and species mix, and the amount of maintenance done on trees near utility facilities.

No geographical area is completely free from the threat of storms, though some areas are more likely to experience severe storms on a regular basis. Utility storm response plans should include provisions for widespread tree failures. Additionally, any local tree pruning program, using appropriate specifications, will help reduce the potential of damage to facilities caused by trees and branch failure during storms.

### Deviation from Standards Following Storms

Following severe storms, tree damage is often widespread, and utility services may be interrupted across a large area. At such times, government authorities or utilities may declare an emergency. Emergency services workers, including utility arborists, are likely to be involved in a coordinated effort to restore critical services. Damaged trees have the potential to impact the safety of both the public and utility workers. To expedite restoration efforts under such urgent circumstances, it may be necessary for workers to deviate from standard pruning practices until the emergency is over and services are restored.

### Corrective Pruning

Following a storm emergency, the condition of remaining trees should be assessed. Ideally, this assessment will be performed by utilities, local governments, and other property owners in a coordinated effort. Corrective pruning methods should be employed where practical and should follow clearly defined goals and objectives.