Common Area Tree Assessment

Prepared For

Woodland Hills Homeowners Association

Prepared By

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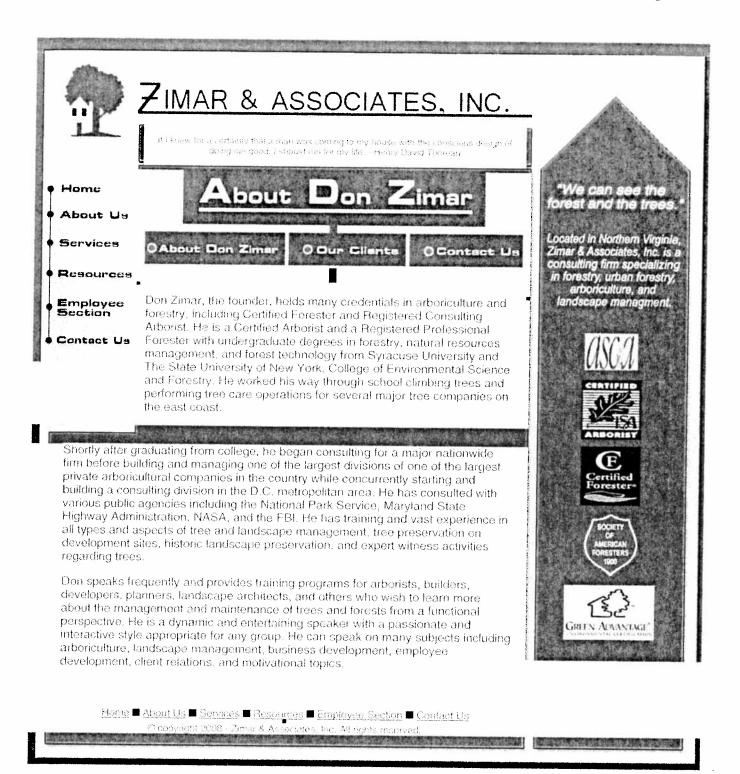


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Introduction

Zimar & Associates, Inc. was contracted by the Woodland Park Homeowners' Association (The Association) to conduct a study of the common area trees both in natural areas and landscape areas. The intent is to focus primarily on the natural areas and specific concerns presented by Walter Sonneville during a walk through of the property. Secondary focus is placed on a review of the landscape area trees. Tertiary focus is placed on the review of trees damaged by underground telecommunications and on potential unsafe trees.

In order to present a manageable discussion of the property, it was broken down into fifteen subsections as defined by logical areas of The Association properties. This sectioning was identified during the walkthrough with Walt Sonneville. The map in Appendix A depicts the association property and identifies the sub-areas as discussed during the walk-through.

The remainder of this report will provide a detailed discussion of the tree resources on The Association property by section. It will also address the following specific issues that were included in the scope of the exercise:

- Areas suitable for replanting and recommendations for methods and species to replant/reforest.
- General health and condition of existing trees in natural areas and landscaped areas. Landscape trees will be discussed in a general section except were conditions are unique to that area.
- Recommendations for improving and maintaining health of trees in landscape and natural areas.

- Discussion of issues related to damage to trees caused by installation of underground telecommunications equipment.
- Identification of potential hazards and recommended corrective actions.
- Issues affecting forest and landscape tree health and condition and recommended corrective activities.

A set of specifications for the implementation of all recommended activities is included in Appendix B.

Area Analysis and Recommendations

Area 1 – Tennis Courts Adjacent to intersection of Wye Mill Court and Wildpark Avenue

This area consists primarily of eighteen to twenty-four inch oak trees that were preserved during the construction of the community. They are in fair to good condition. Many of the trees are showing signs of stress, primarily in tip dieback in the upper crowns. Three trees, labeled F, G, and H on the map in Appendix A have large deadwood that should be removed to improve safety. These trees are a twenty-two inch diameter (all diameters taken at 4.5 feet above ground level) red oak, an eighteen-inch diameter red oak, and a sixteen-inch diameter red oak respectively. They were marked in the field with flagging and an orange paint spot on the root flare. There are few significant landscape trees in this area.

The area is highly used by pedestrian traffic. Compaction is severe. Grass coverage is sparse. There is minor sheet erosion occurring throughout the area. A pedestrian trail is being worn through the area, even though a sidewalk is present nearer the tennis courts.

The following items are recommended in order to improve this area and maintain the health and safety of the trees growing there:

- Hazard prune trees labeled F, G, and H to remove deadwood 2.0 inches and larger at their point of attachment.
- Mulch, to the greatest extent possible all trees. Ideally, this entire area could be mulched and reconverted to a more typical forest understory. Alternatively, create mulch beds around tree clusters that extend at least ten feet from the trunks of all trees and consolidate in irregular patterns. These mulch areas could be planted with understory tree and shrub species from the replanting list in Appendix C. Mulching will also reduce the erosion now occurring in this area.
- Fertilize trees periodically as specified in Appendix B. The removal of leaves and woody debris interrupts the natural nutrient cycling and reduces the amount of organic matter decomposition necessary for healthy tree growth. Supplemental fertilization is recommended until mulch beds are fully established.
- Allow natural leaf accumulation to supplement mulching and aid in reestablishing nutrient cycling.
- Erect barriers to reduce pedestrian traffic or create defined pathway through area. Surface pathway with four to six inch layer of woodchips or hard paving surface.

Area 2 - rear of units on Logmill Lane

This area consists of naturally occurring oaks, black cherry, and red maple but is dominated by a planted white pine screen. The trees are in good health. The crowns of the white pines have consolidated causing them to begin losing lower branches due to shading. Understory species are sparse. No safety issues were noted in this area. There

has been a significant amount of trenching activity for the installation of utilities through this area

The primary recommendation for this area is to supplement the white pine screens with understory shrub plantings. Chose species from appropriate list in Appendix C. Hollies, rhododendrons, and viburnums would be particularly well suited to the pH ranges of soils in this area.

Area 3 - Rear of units along Carlsbad Drive from intersection with Logmill Lane to intersection with Kestrel Court

The trees in this area include white pine, Norway maple, London plane, black cherry, red maple, and silver maple. Most were planted near the time the community was developed. They are generally in good condition with few major pest problems. Exceptions include eastern tent caterpillar on the cherries and anthracnose on the London planes. Neither of these pests is usually life threatening. They are not recommended for treatment in this area. No significant safety issues were noted in this area.

There is a large mowed bank behind this area. This area could easily be converted from a high maintenance area to a lower maintenance area by reforesting. Reforestation could be accomplished simply by discontinuing all mowing activity. Natural succession would result in invasion by pioneer tree species such as Virginia cedar, red maple, black locust, and mulberry. Over many years these would be replaced by climax species, primarily oaks and hickories.

Natural succession could be supplemented by the introduction of climax species. This could be accomplished using seedlings, whips, or larger stock. Larger trees would be more expensive to plant than smaller trees. Planting costs could range from several hundred to several thousand dollars per acre, depending on the intensity of the program and extent of possible community involvement to supplement labor costs. Any trees and shrubs from the list in Appendix C would be appropriate for planting in this area.

Residents of the units abutting this area should be contacted prior to planning any reforestation in this area. They may have concerns regarding views or use of the area and would likely want input into any activities planned for this area.

Area 4 – Rear of units on Carlsbad Drive from Kestrel Court to Tanyard Hill Road

This area is compromised primarily of natural forest preserved during community development. It consists of red oak, white oak, and red maple. Sizes range from sixteen to twenty-four inches in diameter. Quality and health is good with no major insect or disease problems noted. There are significant bare areas within this area resulting in minor sheet erosion.

There are two trees with large deadwood that require pruning to improve safety. Tree A is a twenty-four inch red oak with large deadwood. Tree B is a twenty-four inch red oak with large deadwood and a weak crotch. They should both be hazard pruned to improve safety. Tree B should also be cabled as indicated in the specifications in Appendix B in order to reinforce the structural weakness.

Bare areas should be mulched. Fallen leaves should be allowed to accumulate. These items will aid in reducing the erosion and preventing it from forming small rills, a sign of increasing erosion. In order to facilitate the accumulation of leaf matter, large limbs and fallen woody debris may be retained if not found objectionable by residents.

Area 5 – Rear of units on cul-de-sac at north end of Tanyard Hill Road (known as Lower Tanyard)

This area is comprised primarily of naturally growing black gum, white oak, and red oak. Trees average 12 to sixteen inches in diameter. Some larger trees, thirty inch

diameter and greater, exist along the wood edge. Trees are generally in good condition. No safety related problems were noted in this area.

There is a small area that could be reforested. It is important to work with the residents whose properties border this property when converting grass areas to forest. Reforestation may be accomplished in the manner previously described.

Area 6 – Rear of units at High Timber Court

This area is comprised mainly of naturally occurring forest preserved along the edges of the community. Trees include black cherry, red maple, and black cherry. Condition is good. No major pests were noted, except for eastern tent caterpillar. No treatment is recommended for the eastern tent caterpillar in this area. No safety issues were noted in this area.

Area 7 and 8 - Rear of units on Windjammer Way

This area contains a large wooded area with white oak, red oak, and hickory ranging from 12 to 24 inches in diameter. Trees are generally in good condition. Black cherry and mulberry saplings have begun invading the edges. The black cherry trees are infested with eastern tent caterpillar. No other pests were noted. Eastern Tent caterpillar is not recommended for treatment. No potential safety issues with trees were noted in this area.

Area 9 - South end of Windjammer

This area contains smaller naturally occurring trees on the top of the hill overlooking the storm water management pond. The trees are smaller and include black

cherry, red maple, mulberry, and an occasional Virginia pine. The banks and edges of the pond have been planted where possible. Some of the slope areas also contain naturally regenerating trees including black locust and red maple. There are no significant safety issues in this area.

Area 10 – Rear of units on Wakeforest Drive backing to Travis Avenue including area around pool

This area contains a mixture of red maple, sassafras, black cherry red oak and white oak. They range in size from six to eighteen inches in diameter. This area functions as a primary screen between the homes and Travis Avenue. There is a fifteen to twenty foot turf area between the treed area and the rear lot. The understory appears to be thinning, reducing the effectiveness of the screening. There is some minor sheet erosion occurring on the slopes of this area. There are no significant safety issues noted in this area.

The following recommendations will aid in improving the screening and reducing the potential for erosion.

- Supplement understory to improve screening using evergreens and large shrubs. The best evergreens for this purpose include American holly and mountain laurel, rhododendron, Virginia cedar, and inkberry.
- Plant as much of the grass areas as possible and desired by homeowners using varying sizes of trees and shrubs. Use shrubs listed above to increase screening and supplement with large deciduous trees and small flowering trees.
- Avoid further disturbance for installation of utilities wherever possible.
 Any disturbed areas should be stabilized as soon as utility work is completed.

- Keep all other bare areas mulched with natural leaf litter or supplement with mulch. Allow fallen limbs to accumulate and reduce the potential for leaf litter to be windblown.
- Fertilize existing trees and understory using granular application of 2.5 pounds of nitrogen per thousand square feet of area. Fifty percent of nitrogen should be in slow release form.

Area 11 – Intersection of Tanyard Hill Road and Travis Avenue rear of units at end of Wild Park Avenue

This is a small area of natural forest comprised of red maple, red oak, and white oak with diameters ranging from twelve to eighteen inches in diameter. The trees are generally in good condition. Understory is sparse. It is a key location and entry feature to the community. A one thousand square foot clear area was created by the removal of a large red maple. No safety issues are of concern in this area.

An opportunity for replanting exists on this corner that can both provide reforestation and beautification opportunities for the community. Replanting is recommended that enhances and compliments the natural area using native species. This area is suitable for the planting of one major tree to replace the large tree that was lost complimented by the introduction of several native flowering trees and shrubs. A large red maple, willow oak, or red oak will fill the void left by the removal of the large tree. Several fringe trees, sourwoods, sweetbay magnolias, or serviceberry will additionally enhance this area. Recommended shrubs include viburnum, witchhazel, mountain laurel, deciduous azalea, and serviceberry. Areas around all plantings should be mulched as much as possible to prevent invasion by aggressive and invasive plants.

Area 12 - Intersection of Tanyard Hill and Wakeforest Drive

This area is comprised of naturally occurring red oak, white oak, and hickory ranging in size from twelve to sixteen inches. Condition is generally good. Some previous dieback, that has been pruned out was observed in some edge trees. No safety issues are noted in this area.

Area 13 – Triangle shaped area along Wakeforest Drive and High Timber Court

This area is comprised primarily of red oak, white oak, and hickory. Trees are generally in good condition. Sizes range from twelve to eighteen inches in diameter. The area is well used causing some compaction and minor sheet erosion. The edges bordering the parking area along Wakeforest Drive are being invaded by ailanthus. This invasion creates a rather unnatural and unkempt appearance and harsh edge along the parking area. White pine screening also exists in some places along the edges. Two trees, an eighteen inch red oak and a double twelve inch lead red oak labeled C and D respectively on the map in Appendix A have large deadwood and broken limbs hanging in them.

Every effort should be made to remove the ailanthus from the area along Wakeforest Drive. Ailanthus is highly invasive and can be difficult to control once it becomes established. The ailanthus should be removed and treated with herbicide to prevent sprouting. This area could then be replanted. Small flowering trees and shrubs from the lists provided in Appendix C are recommended to replant this area. Viburnum and serviceberry are appropriate deciduous shrubs for the area. If evergreens are preferred, mountain laurel and American holly are recommended.

Natural leaf litter should be allowed to accumulate in the interior area to reduce the potential for erosion. Trees C and D should receive hazard reduction pruning to reduce the potential hazard to users of the area.

Area 14 – Large interior save area bounded by Tanyard Hill Road, Carlsbad Drive, and behind Wye Mill Court

This is a large area of preserved oaks, hickories and red maples ranging in size from twelve to twenty four inches in diameter. The trees are generally in good condition. Parts of this area are heavily used leading to compaction and minor sheet erosion. Some areas of the understory have been thinned and cleared. Black cheery and red maple are growing as volunteers along many of the edges. Two trees, a twenty-inch diameter black cherry and a twenty-four inch diameter red oak have large deadwood hanging over areas frequented by residents. These trees are labeled I and J respectively.

Pedestrian traffic through this area should be concentrated on well-defined pathways that are surfaced with a four-inch layer of mulch. The mulch should be replenished as necessary to avoid exposure of bare soil. The pathways should be designed out in a manner to avoid the concentration or flow of water along or across them.

Residents should be reminded of the need to preserve the forest diversity by maintaining the understory plants. Once these plants are removed, they are very difficult and expensive to re-establish. All the layers of the forest - overstory, intermediate, understory, and ground covers are important to maintaining the forest ecosystems. These ecosystems are a treasure to the community and should be preserved as much as possible. Once damaged, they are difficult to repair.

Viburnum, witchhazel, native azalea, and serviceberry are recommended to supplement areas that have been cleared. Other bare areas should be mulched. Woody debris and leaf mulch should also be allowed to accumulate. Under no circumstances

should areas be cleared and raked free of the natural mulch layer. This can be very damaging to the natural systems the trees rely on for health.

Aggressive and invasive plants, such as poison ivy, honeysuckle, and greenbriar can be selectively removed and treated. Care must be taken to avoid as much damage as possible to desirable understory plants.

Trees I and J should be hazard pruned to remove deadwood and dangerous limbs two inches and greater in diameter at their point of attachment.

Area 15 - South end of upper tot lot

This area is comprised of several trees preserved during the original development consisting of tulip poplar, black locust and red maple. They are in fair to poor condition. Extensive activity has taken place within their root zones. They are very near the tot lot in a highly used area. There are three trees, a sixteen inch diameter black locust, a triple trunk tulip poplar, and a 12" dead oak labeled C, D, and E respectively on the map in Appendix A that represent safety concerns.

Safety is a primary concern in this area due to the proximity of the tot lot. Therefore removal of tree C and E is a high priority. Tree E should receive three cables to prevent the multiple trunks from splitting apart. Tree E should also be hazard pruned at the time of cabling.

The remainder of the trees in this area should be fertilized and mulched. They should also be monitored periodically to reduce the potential for any problems to develop.

Landscape Areas Throughout Community

The landscaped areas of the community are comprised of primarily the following trees: white pine, ornamental cherries, crabapple, London planetree, sawtooth oak,

flowering dogwood, Norway maple, pin oak, red maple, willow oak, and Bradford pear. Following is a discussion of each type of tree and any problems noted within the community. These trees were typically planted at the time the development was established ten to twenty years ago in varying phases.

The ornamental cherries throughout the community are not doing well. There are no obvious reasons for their poor condition, other than eastern tent caterpillar. However, this pest is seldom a serious cause of problems for the trees, even though infestations this year are very severe. Their decline is more likely related to poor suitability to the site and possibly to the selection of poor stock. The abundant sprouting from the base suggests severe stress and may also be associated with graft failures. It is likely that they will continue to struggle over time and will never overcome this stress. Excessive fertilization is not recommended, as this tends to increase pest problems for trees in this genus. Long-term strategies should include removal and replacement with more suitable trees. Newer varieties of ornamental cherries are hardier and easier to grow, although eastern tent caterpillar will remain a problem. Alternative species include yellowwood, cornelian cherry (actually a dogwood *Cornus mas*), fringetree, saucer magnolia, kousa dogwood, Franklinia, goldenraintree, and stewartia.

The crabapples in the community are doing poorly, similarly to the cherries. They are older varieties that likely have little resistance to common pests, such as apple scab and firelight. They are also likely affected by site stress due to soil and other growing conditions. The apple scab fungi can be treated. It requires three sprays beginning before bud break and continuing into the growing season. They will not die without treatment, but they will likely lose many leaves throughout the summer and defoliate prematurely in the fall. If an outbreak of firelight occurs, many of the trees will be lost. Long-term strategy to maximize the aesthetic condition of the community should include annual treatment with fungicide and removal and replacement of the worst trees. Crabapples should not be fertilized, as this increases their susceptibility to firelight.

The London plane trees on the site are generally in good condition with few observed pests. Major pests include anthracnose, bacterial leaf scorch, lace bugs, and

aphids. The best treatment for all these pests is to keep the trees healthy and avoid fertilization. Severe outbreaks of anthracnose may require treatment. Bacterial leaf scorch is generally not treatable and fatal. Lace bugs and aphids can be easily treated if damaging levels are detected. Periodic fertilization is recommended for trees growing in turf areas.

The sawtooth oaks in the community are generally in good condition with few noted problems. Three pests are of primary concern: gypsy moth, orange striped oakworm, and cankerworm. No signs of these pests were noted, but outbreaks of all three appear to be on the rise in this region. They can be easily treated once identified. Watch for leaf defoliation of any kind throughout the growing season as these pests generally span the entire season at various intervals. Early detection is important.

Flowering dogwoods in the community are generally in fair to good condition. Flowering dogwood in this region is at very high risk to discula anthracnose, a leaf and stem fungi that causes cankering and death. It must be prevented for treatment to be successful. Treatment strategies include rapid removal of infected trees, raking of leaves from dogwood trees, annual fungicide treatments, and general health maintenance. Without a management program many of them will likely succumb to this disease. There were no infections noted on the landscape trees, though dead dogwoods in the wooded area suggest it is present. Long-term strategy includes replacement with resistant varieties and other ornamental species.

Norway maples on the site are all generally in good condition. They are not a particularly good species for this region as they have many pests and growth problems that affect their health. This generally limits their useful lifespan to less than fifty years. They are also an aggressive invasive non-native species. Their use is not recommended. Long-term strategy should focus on removal of trees that begin to decline and replacement with more desirable species.

Pin oaks and willow oaks on the site are generally in good condition. No major pests or conditions were noted. Soil acidity of the site is likely helping them stay healthy. Their pests include those listed for sawtooth oak as well as bacterial leaf scorch and

obscure scale. Maintaining tree health is important. Periodic fertilization of trees growing in turf areas is recommended. Some minor infestations of obscure scale were noticed. These should be tolerable so long as trees are not over fertilized. Levels of obscure scale should be monitored and treated if levels rise to a damaging level.

Red maples on the site are generally in good condition. Red maples have few serious pests in this region. They are typically very hardy and easy to grow. Periodic fertilization is recommended for trees in turf areas.

White pine trees on the site are generally in good condition. No major pest problems were noted. The white pines were generally planted for screening of yards but have begun to lose their effectiveness due to self-pruning. This tendency will continue. In order to maintain and enhance these screening functions, they will likely need to be supplemented with understory plantings. Rhododendron, native azaleas, inkberry, azaleas, Virginia cedar, and viburnum are particularly well suited for this use. In some cases, the competition among the pines is resulting in the decline of subordinate trees. The removal of these trees is recommended in order to allow the dominant trees to utilize the space and reduce stress. This will help prolong the screening life of the white pine over the long term.

Bradford pears on the site are generally in fair condition. They are reaching the end of their useful lifespan and will likely begin suffering severe damage during storms, if they haven't already. The long-term strategy for these trees is replacement with trees with longer life expectancies.

General

It is obvious that Woodland Hills takes great pride in the landscape and forests of the community and has gone to some expense throughout history to maintain them. This is witnessed by the relatively few safety issues identified and the general overall good health of most of the trees as well as the removal of most problem trees. The following general recommendations will aid in the continuing effort by Woodland Hills to provide a great environment for its residents.

- Continue the fertilization program using the specifications provided in Appendix B, particularly for trees in turf areas. (Avoid fertilizing species mentioned where this could be detrimental.) Only fertilize wooded areas where increased understory growth is desirable.
- Mulch individual trees properly, and to the greatest extent possible. White
 pines should be allowed to form natural pinestraw mulch beds beneath.
 Forested areas should retain the leaf litter and fallen debris to the greatest
 extent possible. Supplemental mulch should be added to any bare or
 eroding areas.
- Implement a monitoring program and establish a budget for treatment of
 any potential pest outbreaks. Ask residents to supplement this program by
 taking notice of any changes in the trees on and around their property.
 Several monitoring visits per year should be performed by certified
 arborist to check for any developing hazards and look for more difficult to
 detect pests. Invite community on inspections with the arborist.
- Replant areas where it makes sense to do so and where community
 consensus for replanting is high. Convert as many turf areas as possible
 back to woodland using native species. Other species may be allowed for
 installation in landscaped areas.
- Converting turf areas to forest will require control of the existing sod in
 order for trees to become established. Site preparation prior to planting
 should include some methods of removing or controlling competition from
 grass. Suitable methods include: herbicides or mechanical prepartion in
 the form of sod cutting or tilling. Follow-up applications of herbicide may
 also be necessary.
- Solicit articles for community newsletter to inform people of stewardship issues, such as pest monitoring and management of understory in natural

- areas. Try to also get community involved in planting efforts. This will help raise their awareness of the importance of other maintenance items.
- Establish annual activity budgets for planting and maintenance items
 including fertilization, maintenance pruning, pest monitoring and
 treatments. All new plantings should have an establishment period budget
 to insure adequate monitoring and watering.
- All natural areas can benefit by supplemental understory planting that
 enhances species diversity and density. These plantings will enhance both
 aesthetic and wildlife value, particularly for berry eating songbirds.
- Aggressively remove invasive species such ailanthus before they become rampant throughout the natural areas.
- Utility installations throughout the community have resulted in root damage to a significant quantity of trees. In some cases, open trench excavations were immediately adjacent to tree trunks. This type of damage is likely to take several years to become evident and will result in the decline and/or death of some large trees along the perimeter of the natural areas. The fertilization program for these trees should be as described in Appendix B of this document. In addition, this damage will likely result in increased safety problems in the future. Pruning and removals along these corridors should be anticipated.

Conclusions

Woodland Hills is blessed with a mixture of landscaped and natural areas. These areas play an important role in making Woodland Hills a great place to live. The tree resources at Woodland hills are generally in good condition. They have obviously benefited from previous maintenance activity. The recommendations contained within

this report will help insure that these benefits are realized and maximized over the long term.

Problems in the natural areas arise primarily from the pressure of human activities and a lack of recognition by the residents of how fragile these systems can be. Pedestrian traffic alone can compact soils enough to prevent root penetration and alter them such that roots cannot survive. It is, therefore, very important to limit activities in these areas to passive types of recreation. It is also important to undertake activities that enhance the diversity and quantity, particularly of desirable understory species.

Trees in the landscaped areas are also generally in good condition, with the exceptions noted. Fertilization is generally good, but should be completed to the standards specified in Appendix B. Many of the problems will only be addressed long term by the removal and replacement of inferior species and stock. This is not an extraordinary number of trees. It should be undertaken over time as budgets allow. There is an opportunity for a severe pest outbreak to stress several species. Adequate monitoring by residents and professional arborists can help reduce this risk. Many of the trees will benefit aesthetically from pruning.

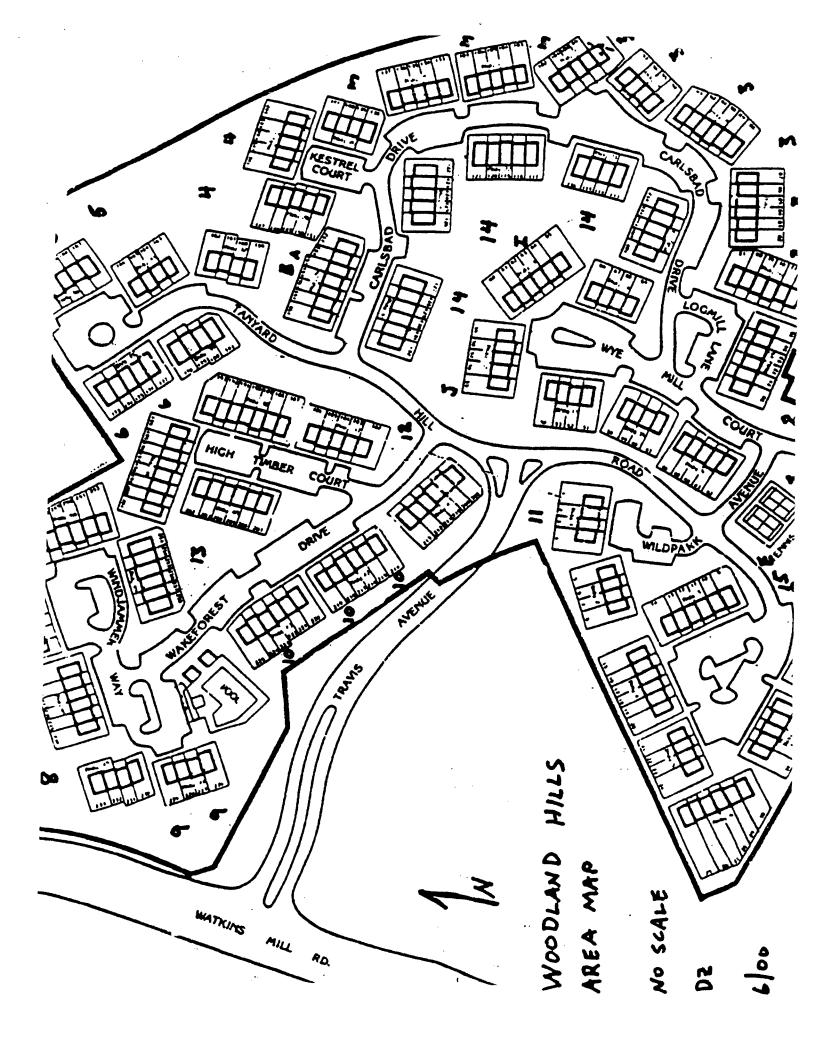
The utility work recently undertaken around the property will have future maintenance implications that must be planned for. There will be an unpredictable number of trees requiring pruning and removal in the future.

There appears to be a need for more information exchange with residents, either through community newsletter or other means. This communication should focus on conveying information about:

- the need to care appropriately for the natural ecosystems.
- to prepare them for the coming removal of certain trees.
- to build support for other replanting and maintenance activities.

There were ten trees with problems related to safety of the residents and their properties. These items should be completed as soon as possible.

Site Map



Arboricultural Specifications

1) Removals.

- a) Trees designated, as removals shall be removed by hand using as much care as possible to ensure that no damage occurs to any tree or understory plantings.
- b) All brush and debris is to be chipped and distributed into natural areas as mulch. Mulch shall be no greater than four inches in depth and kept at least three inches from all tree trunks.
- c) Wood to be cut into firewood lengths of 18 24" and left piled neatly on site out of pathways.

2) Arboriculture Activities

a) All trees indicated for preservation shall have the following maintenance activities completed by arborist, as indicated in the Shrieber property tree survey.

b) Fertilization.

- i) Fertilizer shall be injected into the soil using liquid application techniques and soil injection probe.
- ii) Fertilizer shall be balanced arboricultural grade product applied at a rate of 2.0 pounds of nitrogen per thousand square feet of root zone treated. At least 50% of nitrogen shall be in slow release form.
- iii) A bio-stimulant and mycorrhizae product shall be added to formula at label rates.
- iv) Fertilization shall be applied throughout root zone of tree beginning four feet from trunk and extending one foot of radius from the trunk for every inch of trunk diameter. Injections shall be made on two-foot grid spacing.
- v) Contractor shall submit a lump sum price for areas indicated.

c) Pruning.

i) Pruning shall conform to American National Standards Institute A300 pruning standards for maintenance pruning or hazard pruning.

- ii) Maintenance pruning, unless otherwise noted in comments, shall consist of crown cleaning to remove all deadwood 1.5 inches or larger at their point of attachment. Diseased limbs shall be removed or treated at the discretion of the arborist. While pruning, the arborist shall make note of any conditions that affect the health or condition of the tree and recommend corrective treatment for these conditions.
- iii) Hazard pruning shall consist of the removal of all dead or dangerous limbs 2.5 inches or greater in diameter at their point of attachment. Large masses of smaller dead limbs that significantly detract from the trees aesthetics shall be crown cleaned.
- iv) Trees designated for crown restoration shall be pruned to improve the structure, form, and appearance of trees that have been damaged by improper pruning, storms, or vandals.
- v) Under no circumstances shall the interior of trees be stripped of foliage, suckers, epicormic branching, or other live growth. Interior growth may be thinned as necessary to remove branches damaged during pruning operations.
- vi) Vine removal shall be included as part of the pruning process.
- vii) Spikes shall never be used for pruning under any circumstances.
- viii) Contractor shall provide a lump sum price for pruning of all trees indicated in the tree inventory.

d) Integrated Pest Management

- Arborist shall submit a seven visit integrated pest management program for the identification and treatment of pests associated with the species found on the site.
- ii) Inspection and treatments shall begin in May and continue though September.
 A certified arborist who is also registered pesticide applicator shall implement program.

- iii) First visit shall include the collection and analysis by independent laboratory of four soil samples taken from varying site locations, two from front and two from rear of property.
- iv) All Federal, State, and local laws, codes, rules, regulations and procedures shall be strictly adhered to at all times by contractor.
- v) Contractor shall provide a lump sum price and unit price for each inspection and treatment visit.

e) Cabling.

- i) Cabling shall consist of extra-high-strength steel cable attached using preformed cable grips and thimbles.
- ii) Cables shall be sized appropriate to size of limbs being cabled based on the National Arborist Association Standards for Cabling and Bracing. All other factors shall also conform to these standards.
- iii) Contractor shall submit a lump sum and per unit price per cable.

f) Lightning Protection

- i) Lightning protection shall be installed in trees indicated according to National Arborist Association standards.
- ii) Contractor shall submit a lump sum price for trees indicated.
- 3) Qualifications. All contractors bidding on work must meet the following minimum qualifications.
 - a) Certified arborist. An arborist certified by the International Society of Arboriculture must be on site either completing or directly supervising all work being performed.
 - b) **Pesticide application.** A certified arborist who is a registered commercial pesticide applicator or registered technician certified in the Commonwealth of Virginia must perform all chemical applications.
 - c) **Insurance.** Contractors must submit proof of insurance including Workmen's Compensation, general liability, and automobile liability prior to award of contract at levels acceptable to the owner.

- 4) Materials and workmanship. The contractor shall perform all work in a neat and workmanlike manner and in strict accordance with all plans and specifications.
 - a) **Equipment.** Equipment shall be modern and in good working condition free of fluid leaks. Clean up of any fluid spills shall be the responsibility of contractor to the satisfaction of owner.
 - b) **Tools.** All tools shall be modern and maintained to perform the duty for which they are intended. They shall be treated appropriately to prevent the spread of pests or disease problems to the owner's trees.
 - c) **Employees.** Employees shall work in a professional manner and where appropriate attire at all times.
 - d) Access. All work is to be performed without operation of equipment within the root zone of trees to be preserved. Exception may be made with permission of owner if equipment is operated on layer of plywood placed over six inch layer of wood chips to protect root zones.
- 5) Safety. Contractor shall conform to all applicable federal, state, local and industry safety standards including OSHA, ANSI, NAA etc.
 - a) Safety program. Contractor shall have an established and documented safety and training program for their employees.
- 6) **Pricing.** Pricing shall be lump sum itemized by specific tasks as indicated in sections 2) and 3). An hourly or per unit price shall be submitted for work which may be added or subtracted under each item.

Recommended Species Lists¹

Large Deciduous Trees		
Botanical name	Common Name	
Acer Rubrum	Red maple	
Acer saccharum	Sugar maple	
Carya spp.	Hickory species	
Celtis laevigata	Hackberry	
Fagus grandifolia	American beech	
Cladastrus lutea	Yellowwood	
Gleditsia triacanthos	Honeylocust	
Liriodendron tulipifera	Tulip poplar	
Magnolia acuminata	Cumber magnolia	
Nyssa sylvatica	Blackgum	
Quercus alba	White oak	
Quercus bicolor	Swamp white oak	
Quercus phellos	Willow oak	
Taxodium distichum	Baldcypress	
Tilia americana	Basswood	
E	vergreen Trees	
Ilex opaca	American holly	
Juniperus virginiana	Virginia cedar	
Magnolia grandiflora	Southern magnolia	

¹ Most species are native to North America and/ or Maryland. Species list should be used only as a guide. Many other non-native species may be useful in the landscape setting.

Pinus taeda	Loblolly pine
Pinus Virginian	Virginia pine
Tsuga caroliniana	Carolina hemlock
	rnamental Trees
Amelanchier spp.	Serviceberry
Chionanthus virginicus	Fringetree
Cornus mas	Cornelian cherry
Franklinia spp.	Franklinia
Magnolia soulangiana	Saucer magnolia
Magnolia stellata	Star magnolia
Magnolia virginiana	Sweetbay magnolia
Ostrya virginiana	Hophornbeam
Oxydendrum arboreum	Sourwood
Stewartia ovata	Mountain stewartia
	Shrubs
Aesculus parviflora	Bottlebrush buckeye
Calycanthus floridus	Carolina allspice
Cephalanthus occidentalis	Buttonbush
Corylus americana	American filbert
Tothergilla spp.	Fothergilla
Calmia latifolia	Mountain laurel
indera benzoin	Spicebush
hododendron spp.	Rhododendron
iburnum spp.	Viburnum