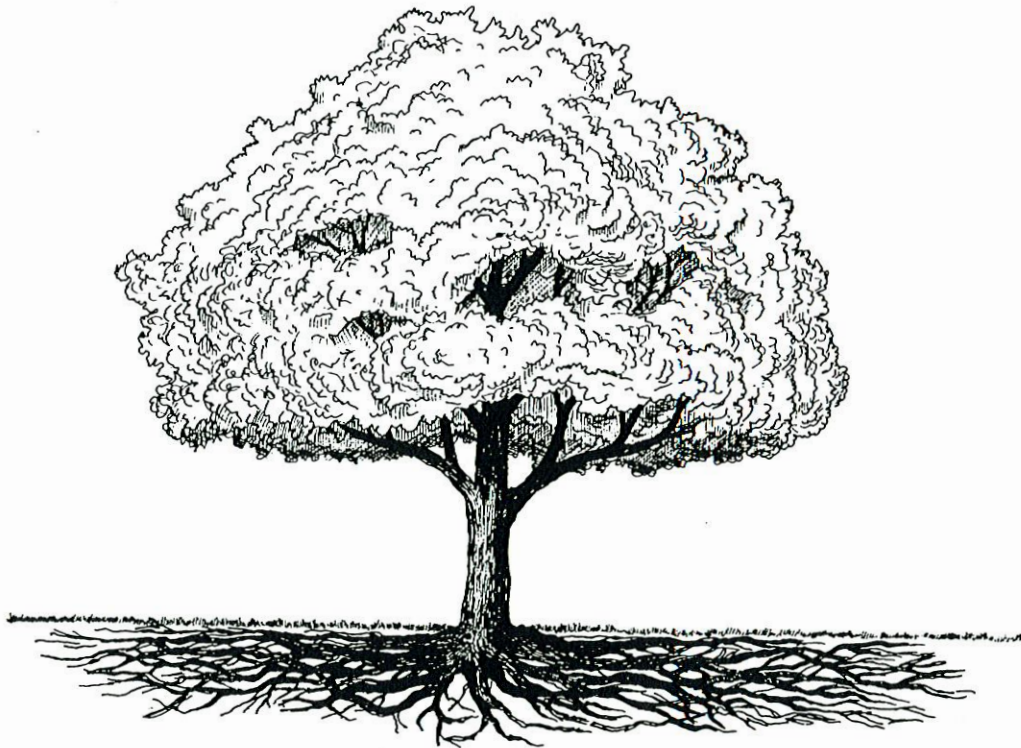


*Town of Brookfield
Urban Forestry Management Plan &
Tree Inventory*



August 11, 2002

Prepared by:
Bluestem Forestry Consulting Inc.
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Armstrong Creek, WI 54103
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This document was funded in part by a United States Department of Agriculture Forest Service Cooperative Forestry Assistance grant and the State of Wisconsin Department of Natural Resources Urban and Community Forestry grant program.

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Town of Brookfield

Urban Forestry Management Plan & Street Tree Inventory

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1. Projected Five Year Schedule of Activities
2. Park Maps
3. Immediate Removals
4. Immediate Prunes
5. Scheduled Removals
6. High Priority Prunes
7. Stump Removals
8. Monitors
9. Training Prunes
10. Planting Sites
11. Sample Work Order
12. Town Map with Zones Delineated
13. Glossary of Terms
14. Risk Management Guide
15. Wisconsin Department of Natural Resources Planting Specifications

EXECUTIVE SUMMARY

The Town of Brookfield recognizes that trees provide important economic, ecological and environmental benefits that significantly improve the quality of urban life. Bluestem Forestry Consulting Inc. was contracted to complete a street and park tree inventory and prepare a comprehensive management plan during the spring of 2002. This management plan and tree inventory marks a renewed commitment to Brookfield's urban forestry program. This document reports the findings of the inventory and makes specific, prioritized recommendations for managing the urban forest resource for the next five years and beyond based on available resources and needs.

Important points of the inventory and current tree management program include:

- A total of 601 trees and 102 planting sites.
- There are 27 trees in need of removal (3.9%) and 7 trees that need to be pruned for safety reasons (1.1%).
- 46 different species of trees exist.
- The top five species are Green Ash (10.9% of total population), Cottonwood (10.1%), Blue Spruce (9.6%), Willow (6.7%) and Boxelder (6.7%).
- 58.5% of the population is in good or excellent health.
- 27.2% of the forest is 19" DBH or greater. DBH (diameter at breast height) is measured in inches at 4.5 feet above the ground.
- The total dollar value of the trees is \$1,152,047.67. Average dollar value per tree is \$1,916.88.
- The Parks and Recreation Director, who acts as Town Forester currently spends 10% of his time on the community forestry program.
- The forestry budget fluctuates greatly from year-to-year. In 2002 the budget is approximately \$65,000. This includes grant funding for special projects and employee cost.
- Brookfield has a Beautification Committee/Tree Board that serves as an advisor to Town Staff.
- The Town is currently applying for status as a Tree City USA.

STATEMENT OF PURPOSE AND SCOPE

The purpose of the Brookfield's urban forest management plan is to recommend specific activities and designate responsibilities to improve the street tree urban forest. This plan includes specific, prioritized, inventory-based recommendations for managing the urban forest. It includes a five year budget outline and a directive for responsibilities and support needs. The Parks & Recreation Director in cooperation with other Town employees and Administration will be responsible for implementation of this plan.

THE BROOKFIELD COMMUNITY FOREST

The Town of Brookfield is located in Southeast Wisconsin near the City of Milwaukee. The Town itself is bordered by the City of Brookfield, the City of Waukesha and the Village of Pewaukee. Brookfield currently has 6100 residents. The Town of Brookfield and surrounding areas have experienced very fast growth both from new home building and shopping center development within the past decade. The Town of Brookfield has experienced significant annexation from the City of Brookfield and is trying to stop further annexation.

The street tree urban forest consists mostly of homeowner planted trees. There are very few "traditional" street right-of-ways where a sidewalk exists, most are ditch-type settings. Maintenance has been sporadic and is primarily performed on an as-needed basis. Brookfield has three well established parks: Wray Park, Brook Park and Marx Park. Additionally, there is a large conservancy area that has been set aside to protect it from development.

Much of the terrain in Brookfield is lowland swamp. A large portion of the conservancy has standing water. Poplar Creek meanders throughout the Town. Problems associated with marshy ground are prevalent including a severe mosquito problem.

The park and street trees contribute greatly to the quality of life in Brookfield. A few of the many benefits of Brookfield's urban forest include:

- *Reduced heating and cooling costs.*
- *Reduced water runoff resulting in a decreased storm sewer size.*
- *Reduced soil erosion.*
- *Occupancy rates are higher for both residents and businesses when trees are present.*

- *Air and noise pollution reduction.*
- *Increased property values of up to 15%.*
- *Winter and summer wind breaks.*
- *Increased wildlife diversity.*
- *Improved aesthetic quality.*

Below is a discussion of the specific areas of the Town that were included in the inventory.

Street Trees

Street trees provide a sense of continuity in neighborhoods. They define neighborhoods by their uniformity and designate areas of the community by their diversity. They provide privacy from traffic and streets and form a barrier between private yards and public street space.

Of a possible 498 trees and planting sites located along the street right-of-way, only 15 planting sites or trees are present where a sidewalk creates a defined boulevard. Most of the spaces occur along streets with ditches or curbs and without sidewalks. While species diversification is fairly good overall, there are large numbers of weak wooded species or species that are undesirable along right-of-ways for traffic visibility reasons. These include blue spruce (representing 10.4% of the street tree population), boxelder (9.3%), Siberian elm (5.3%) as well as white cedars and willows. However, most (72.2%) of the street tree population is excellent or good health. Size diversification is also excellent. Greater than 24% of the population is 19" in diameter or greater. This is an admirable number of large trees.

There are 22 street trees that are in need of removal. The causes for removal vary, but the most commonly occurring situations are: decaying trunks, trunk and crown cavities, excessive decline due to age, and occasionally cracks in trunks at major unions. Trees designated for removal are typically in very poor or poor condition. Most of these defects can be attributed to a lack of routine care. A "monitor" category also exists. A tree that is beginning to decline or has minor to moderate problems such as root damage, a moderate lean or displays initial stages of decay will need to be monitored regularly. There are 20 trees that need to be monitored, most of which are in poor or fair condition. Additionally, there are 3 trees that need to be pruned for safety reasons. One of these trees has a decay on a limb over 14" in diameter, and the other two have decaying branch stubs. Trees that need safety pruning can be in a variety of conditions, but are most likely in the fair or good category. These conditions will most likely improve once the pruning problem has been resolved.

No street plantings have been completed by the Town in the past. The trees that are present were planted by homeowners or were "volunteers." Median plantings are being completed on Bluemound Road this spring and these are the first plantings the Town has completed along street right-of-ways. Planting sites were identified where suitable space existed. No sites were identified in areas where ditches occurred. There are 102 vacant planting sites in the Town. All of these sites are capable of growing a large sized tree.

A unique situation exists at the intersections of Watertown and Springdale Roads. The southeast section of this intersection is a marsh with very dense, dead, standing timber. This is a naturally occurring situation where trees have grown in standing water. This creates a very unique niche in the nearby neighborhoods, but the Town will need to remove some of the dead trees closer to the roads so that no accidents occur if these trees were to fall of their own accord. This removal can be done quickly and easily because the felled trees can be left and the stumps will not need to be ground out.

The following are some additional situations that were noted and need to be addressed.

Street Tree Recommendations:

- ~ Continue to diversify plantings by implementing the suggested species listed on page 25 of this plan.
- ~ Do not plant trees too closely to street signs and intersections. Stay at least 40' away from these areas.
- ~ Print flyers and publish newspaper articles on private homeowner species selection, pruning and planting techniques. The flyers can be distributed with water bills and left at the Town Hall to be picked up. Door hangers can be distributed when a tree has been planted or routine pruning is occurring.
- ~ Mulch all new plantings and declining mature trees to prevent lawnmower damage, weeds and encourage root growth.
- ~ Do not allow planting of view obstructing trees such as blue spruce or white cedar.

Park Trees

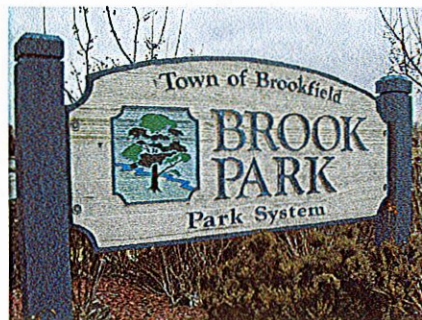


Marx Park is located along Poplar Creek Road and Barker Road. It has ballfields, playground equipment and a shelter house with restrooms. Poplar Creek runs along one side of this park. At the time the inventory was completed 8 trees had recently been removed. As a result, no additional removals are necessary. While there are 13 different species present, 60% of the tree population is either a cottonwood or an elm species. This is a fairly wet site as witnessed by the high number of water-loving cottonwood and elm. Overall the trees are in very good health.

Another notable situation is a number of 1" caliper trees that have recently been planted along Barker Road that are not fairing well. One inch caliper trees are not able to stand even moderate winds without leaning or suffering leaf damage and they typically take longer to overcome minor setbacks such as lawnmower damage.

Marx Park Tree Recommendations:

- ~ Plant a variety of wet tolerant species such as river birch, larch and red maple.
- ~ Plant trees that are from 1.5" caliper to 2.5" caliper.
- ~ Consider planting evergreens along the Barker Road side of the park to shield the noise pollution.

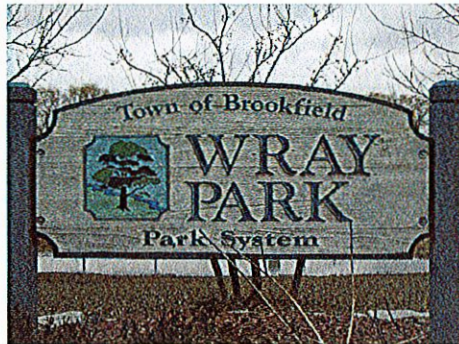


Brook Park is located at the intersection of Brook Park Drive and Gray Fox Drive. There are two large ponds in the park and Poplar Creek runs along the Northwest side of the

park. This park covers a large area and the tree stocking is minimal. Of the 47 trees, only ten species are present and these are predominately willow and green ash. A large goose population exists. There are no buildings or facilities aside from a few picnic benches. Extensive tree planting should take place here. The park's irregular shape is not suited to ballfields or sports related activities, but it is a large neighborhood park that could greatly benefit from shade.

Brook Park Tree Recommendations:

- ~ Focus all park plantings here until greater stocking is reached.
- ~ Plant a wider variety of species. Include smaller growing trees with as well as large growers.
- ~ Avoid planting 1" caliper trees. Plant trees that are from 1.5" caliper to 2.5" caliper.



Wray Park can be found along Mary Lynn Drive with an entrance off of Jaclyn Drive. Again, there are two large ponds in the park and Poplar Creek runs along one side of the park. The park has ball fields, tennis courts, playground equipment and a basketball court. There are 57 trees in this park. About half of these are willow. Only one tree was in need of removal, but the willows need monitoring and a thorough pruning.

Wray Park Tree Recommendations:

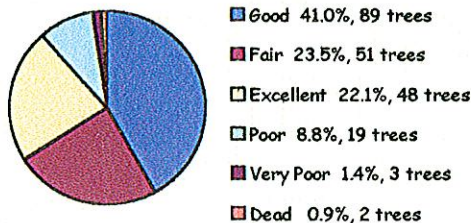
- ~ Plant higher quality species such as oak, maple, crabapple and honeylocust.
- ~ Complete an extensive pruning of large trees paying particular attention to the willows.

TREE INVENTORY

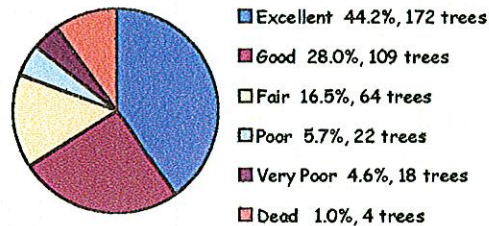
During March and April of 2002, Bluestem Forestry Consulting Inc. conducted a street and park tree inventory. All trees along the street right-of-way and in Marx, Brook and Wray Parks were inventoried, excluding wooded areas. Street tree data was collected from left to right when facing the house. If a tree was present on the side of a lot, but on a different street, the sidestreet was noted. The following data was collected: address, street, side of lot, tree site number, sidestreet (when appropriate), species, dbh, condition, maintenance, boulevard type, presence of overhead utilities, defects, condition percentage rating, location percentage rating, species percentage rating and appraised dollar value. Dollar values were determined using the International Society of Arboriculture's "Valuation of Landscape Trees, Shrubs and Other Plants," Seventh Edition. Species, tree location and tree condition are used to calculate the appraised value of the individual trees. To further aid in understanding the terminology associated with the inventory findings, a Glossary of Terms can be found as attachment 13.

The following graphs give a visual representation of the inventory results for the parks and street trees individually and as a whole:

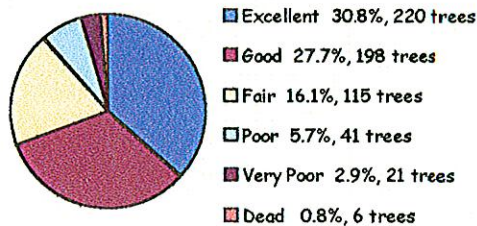
Park Tree Conditions



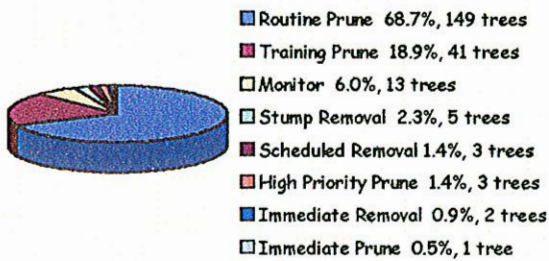
Street Tree Conditions



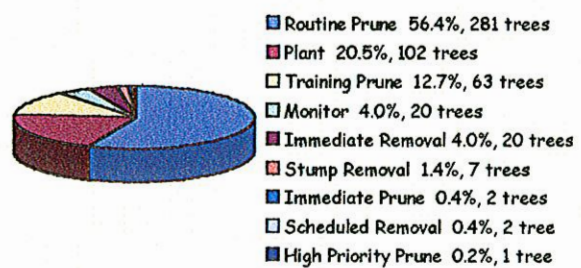
Street & Park Tree Conditions



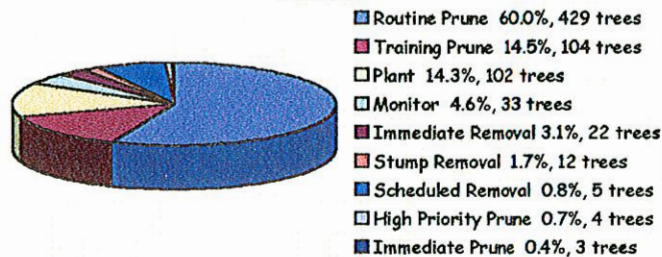
Park Tree Maintenance Needs



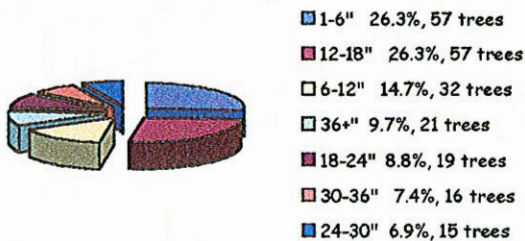
Street Tree Maintenance Needs



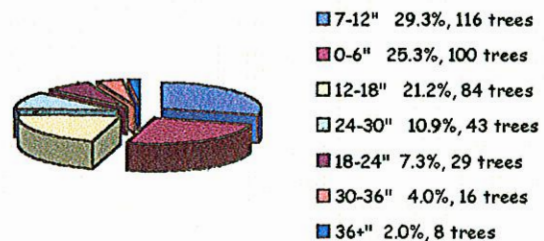
Street & Park Tree Maintenance Needs



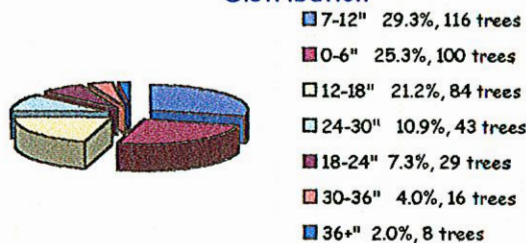
Park Tree Diameter Distribution



Street Tree Diameter Distribution



Street & Park Tree Diameter Distribution



Ten Most Frequent Park Species

(Species, Percentage of Population, # of Trees)



| | |
|----------------|-----------------|
| ■ Cottonwood | 20.3%, 44 trees |
| ■ Willow | 17.1%, 37 trees |
| □ Green Ash | 12.9%, 28 trees |
| □ Blue Spruce | 8.3%, 18 trees |
| ■ Siberian Elm | 6.0%, 13 trees |
| ■ American Elm | 5.1%, 11 trees |
| ■ Norway Maple | 4.6%, 10 trees |
| □ Honeylocust | 4.1%, 9 trees |
| ■ Silver Maple | 3.7%, 8 trees |
| ■ Other | 18.0%, 39 trees |

Ten Most Frequent Street Species

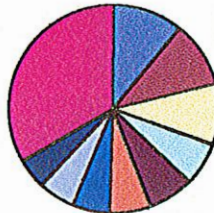
(Species, Percentage of Population, # of Trees)



| | |
|----------------|------------------|
| ■ Blue Spruce | 10.4%, 41 trees |
| ■ Green Ash | 9.8%, 39 trees |
| □ Boxelder | 9.3%, 37 trees |
| □ Norway Maple | 7.6%, 30 trees |
| ■ Honeylocust | 6.6%, 26 trees |
| ■ Crabapple | 6.1%, 24 trees |
| ■ Siberian Elm | 5.3%, 21 trees |
| □ Sugar Maple | 4.8%, 19 trees |
| ■ Cottonwood | 4.5%, 18 trees |
| ■ Other | 35.6%, 141 trees |

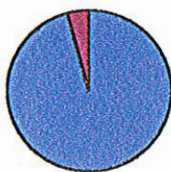
Ten Most Frequent Street & Park Species

(Species, Percentage of Population, # of Trees)



| | |
|----------------|------------------|
| ■ Green Ash | 10.9%, 67 trees |
| ■ Cottonwood | 10.1%, 62 trees |
| □ Blue Spruce | 9.6%, 59 trees |
| □ Willow | 6.7%, 41 trees |
| ■ Boxelder | 6.7%, 41 trees |
| ■ Norway Maple | 6.5%, 40 trees |
| ■ Honeylocust | 5.7%, 35 trees |
| □ Siberian Elm | 5.5%, 34 trees |
| ■ Crabapple | 4.9%, 30 trees |
| ■ Other | 33.3%, 204 trees |

Presense of Overhead Utilities for Total Population



| | |
|------------------------------|-------|
| ■ No overhead utilities | 95.7% |
| ■ Overhead utilities present | 4.3% |

Types of Boulevards for Total Population



| | |
|------------------------|-------|
| ■ Unrestricted | 58.7% |
| ■ Park | 30.3% |
| □ Median | 8.8% |
| □ Formal Boulevard 6'+ | 2.1% |

Condition & Diameter Distribution of the Ten Most Frequent Species

GREEN ASH

Dollar Value of \$163,315.04 for 67 trees = \$2,437.54/tree

| | Excellent | Good | Fair | Poor | Very Poor | Dead | Total |
|--------|-----------|------|------|------|-----------|------|-------|
| 1-6" | 7 | 4 | 6 | 3 | | | 20 |
| 7-12" | 8 | 6 | | | | | 14 |
| 13-18" | 7 | 9 | 4 | 2 | | | 22 |
| 19-24" | 2 | 3 | 1 | | 1 | | 7 |
| 25-32" | 1 | | | 1 | 1 | | 3 |
| 33"+ | | | | | | | 1 |
| Total | 25 | 11 | 11 | 6 | 2 | 0 | 67 |

COTTONWOOD

Dollar Value of \$42,154.95 for 62 trees = \$679.92/tree

| | Excellent | Good | Fair | Poor | Very Poor | Dead | Total |
|--------|-----------|------|------|------|-----------|------|-------|
| 1-6" | | 1 | | | | | 1 |
| 7-12" | 2 | | | 1 | | | 3 |
| 13-18" | 1 | 20 | 2 | 1 | | | 24 |
| 19-24" | 1 | 10 | 2 | | | | 13 |
| 25-32" | 1 | 11 | 1 | | 1 | | 14 |
| 33"+ | | 4 | 1 | 1 | 1 | | 7 |
| Total | 5 | 46 | 6 | 3 | 2 | 0 | 62 |

BLUE SPRUCE

Dollar Value of \$71,208.51 for 59 trees = \$1,206.92/tree

| | Excellent | Good | Fair | Poor | Very Poor | Dead | Total |
|--------|-----------|------|------|------|-----------|------|-------|
| 1-6" | 11 | 4 | | 2 | | | 17 |
| 7-12" | 24 | 6 | 1 | | | | 31 |
| 13-18" | 6 | 4 | 1 | | | | 11 |
| 19-24" | | | | | | | 0 |
| 25-32" | | | | | | | 0 |
| 33"+ | | | | | | | 0 |
| Total | 41 | 14 | 2 | 2 | 0 | 0 | 59 |

WILLOW

Dollar Value of \$240,119.72 for 41 trees = \$5,856.58/tree

| | Excellent | Good | Fair | Poor | Very Poor | Dead | Total |
|--------|-----------|------|------|------|-----------|------|-------|
| 1-6" | | | | | | | 0 |
| 7-12" | 2 | | | | | | 2 |
| 13-18" | | 1 | | | | | 1 |
| 19-24" | | 2 | 1 | | | | 3 |
| 25-32" | | 4 | 2 | 1 | 1 | | 8 |
| 33"+ | | 2 | 20 | 3 | 2 | | 27 |
| Total | 2 | 9 | 23 | 4 | 3 | 0 | 41 |

BOXELDER

Dollar Value of \$15,389.72 for 41 trees = \$375.36/tree

| | Excellent | Good | Fair | Poor | Very Poor | Dead | Total |
|--------|-----------|------|------|------|-----------|------|-------|
| 1-6" | 1 | 3 | | | | | 4 |
| 7-12" | | 3 | 5 | | | 1 | 9 |
| 13-18" | 1 | | 5 | 2 | 1 | | 9 |
| 19-24" | | | 5 | 1 | 2 | | 8 |
| 25-32" | | | 4 | 6 | 1 | | 11 |
| 33"+ | | | | | | | 0 |
| Total | 2 | 6 | 19 | 9 | 4 | 1 | 41 |

NORWAY MAPLE

Dollar Value of \$46,367.67 for 40 trees = \$1,159.19/tree

| | Excellent | Good | Fair | Poor | Very Poor | Dead | Total |
|--------|-----------|------|------|------|-----------|------|-------|
| 1-6" | 6 | 6 | 5 | 1 | | | 18 |
| 7-12" | 7 | 2 | 6 | 1 | | | 16 |
| 13-18" | 2 | 2 | 1 | | | | 5 |
| 19-24" | | | | | | | 0 |
| 25-32" | | 1 | | | | | 1 |
| 33"+ | | | | | | | 0 |
| Total | 15 | 11 | 12 | 2 | 0 | 0 | 40 |

HONEYLOCUST

Dollar Value of \$21,049.00 for 35 trees = \$601.40/tree

| | Excellent | Good | Fair | Poor | Very Poor | Dead | Total |
|--------|-----------|------|------|------|-----------|------|-------|
| 1-6" | 26 | | 1 | 1 | | | 28 |
| 7-12" | 2 | 2 | | | | | 4 |
| 13-18" | | 2 | 1 | | | | 3 |
| 19-24" | | | | | | | 0 |
| 25-32" | | | | | | | 0 |
| 33"+ | | | | | | | 0 |
| Total | 28 | 4 | 2 | 1 | 0 | 0 | 35 |

SIBERIAN ELM

Dollar Value of \$20,507.37 for 34 trees = \$603.15/tree

| | Excellent | Good | Fair | Poor | Very Poor | Dead | Total |
|--------|-----------|------|------|------|-----------|------|-------|
| 1-6" | | | 1 | | | | 1 |
| 7-12" | 2 | 2 | | | | | 4 |
| 13-18" | 1 | 11 | 4 | | | | 16 |
| 19-24" | 1 | 3 | | | | | 4 |
| 25-32" | | 4 | | | 1 | | 5 |
| 33"+ | 1 | 3 | | | | | 4 |
| Total | 5 | 23 | 5 | 0 | 1 | 0 | 34 |

CRABAPPLE

Dollar Value of \$18,266.04 for 30 trees=\$608.87/tree

| | Excellent | Good | Fair | Poor | Very Poor | Dead | Total |
|--------|-----------|------|------|------|-----------|------|-------|
| 1-6" | 19 | 3 | 1 | | | | 23 |
| 7-12" | 5 | 2 | | | | | 7 |
| 13-18" | | | | | | | 0 |
| 19-24" | | | | | | | 0 |
| 25-32" | | | | | | | 0 |
| 33"+ | | | | | | | 0 |
| Total | 24 | 5 | 1 | 0 | 0 | 0 | 30 |

AMERICAN ELM

Dollar Value of \$42,952.63 for 24 trees = \$1,789.69/tree

| | Excellent | Good | Fair | Poor | Very Poor | Dead | Total |
|--------|-----------|------|------|------|-----------|------|-------|
| 1-6" | 1 | | 1 | | | | 2 |
| 7-12" | 4 | 5 | 2 | | | | 11 |
| 13-18" | 2 | 4 | 1 | | | 1 | 8 |
| 19-24" | 1 | | | | | | 1 |
| 25-32" | 1 | 1 | | | | | 2 |
| 33"+ | | | | | | | 0 |
| Total | 9 | 10 | 4 | 0 | 0 | 1 | 24 |

STAFFING AND EQUIPMENT

Brookfield does not have a designated forestry department, however the Parks & Recreation Director functions as the Town forester. The Parks & Recreation Director is responsible for all of the forestry related work in addition to:

All parks activities

Grant writing

Tree Board/Beautification Committee

The P & R Director currently spends approximately 10% of his time on forestry work. He anticipates that the completion of this project and with other increasing projects and responsibilities that the time spent may increase to 20-25%. Based on the inventory data, this time should be sufficient to complete the forestry tasks.

The Town's forestry equipment includes: a chipper, 4 chainsaws, pole pruning saws, handheld pruning shears, rope, helmets, safety chaps and safety vests. Tree work is completed by four people: the Parks & Recreation Director, the Department of Public Works Superintendent, one Parks crew member and one Parks/Public Works crew member. All work is performed in-house. A bucket truck is rented periodically to remove and prune larger trees. A stump grinder is also rented to grind out stumps.

Brookfield has a Beautification Committee/Tree Board that serves as an advisor to the P & R Director. They do have their own budget for tree purchase that falls under the control of the Parks & Recreation Department.

URBAN FORESTRY GOALS

The inventory was the first step towards establishing a defined, efficient forestry program for the Town of Brookfield. The next step is to identify goals and begin the process of implementation. The two primary goals that have been identified to establish the program in order of priority are:

GOAL 1: ELIMINATE HIGH RISK SITUATIONS.

Objective A: Remove high risk trees.

Objective B: Prune high risk trees.

Objective C: Stump Grindings.

GOAL 2: ESTABLISH A ROUTINE, COMPREHENSIVE URBAN FORESTRY PROGRAM.

Objective A: Perform yearly tree inspections/Evaluate Risk Management Program.

Objective B: Perform training prunes.

Objective C: Perform routine pruning and removals.

Objective D: Plant high quality trees with low maintenance requirements.

Objective E: Ensure an adequate budget.

Objective F: Inventory updating.

Objective G: Other considerations

GOAL 1: Eliminate high risk situations.

The first and foremost objective of any municipality entrusted with the responsibility of an urban forest is the safety of its residents and visitors. Until a safe environment has been attained, no other objectives can be tackled. The following is a prioritized list of actions that need to be taken to eliminate the high risk situations identified by the inventory:

1. Remove trees identified as Immediate Removals.
2. Prune trees identified as Immediate Prunes.
3. Remove trees identified as Scheduled Removals.
4. Prune trees identified as High Priority Prunes.
5. Grind out existing stumps.

Objective A: Remove High Risk Trees.

Tree removals are an integral part of a good forest management program. Removals are as necessary to the urban forest's life-cycle as are tree plantings and maintenance. Removals do, at times, stimulate a public reaction because people grow attached to the trees in the vicinity of their homes. Nevertheless, a successful urban forestry program demands that a removal policy be adopted and applied uniformly throughout the Town. A clear policy provides coherent guidelines to enable Town officials and crews to make informed removal decisions. Furthermore, such a policy can help allay public concerns about tree removals. The Town's potential losses from liability claims are also greatly reduced due to healthier and lower risk trees.

The goal of a removal plan is to develop a comprehensive risk reduction program that will guarantee the timely removal of high risk or potentially high risk trees as well as to heighten staff awareness of hazard abatement procedures.

There are three important reasons for establishing a strong removal policy. The first is to maintain safe public areas by reducing potentially high risk trees and the liability associated with them. Secondly, the removal of dead and declining trees allows the urban forest manager to make room for new diverse planting which in turn increases the overall health of the community forest. Thirdly, it is more economical to maintain healthy trees rather than decadent, senescing, over mature trees.

In Wisconsin most municipal governments have a legal duty to exercise reasonable care to protect the general public from foreseeable hazards. To minimize the liability associated with trees in high use areas, such as urban streets and parks, land managers must demonstrate that they are exhibiting "reasonable care" in maintaining these trees.

The initial cost of starting a risk reduction program is high because of the large number of high-risk trees found in a thorough assessment. Based on the inventory data, Bluestem estimates that 27 trees should be removed from the existing tree population. Once this initial group of trees is removed, the Town's removal program should stabilize at approximately 19 removals per year (2% of the total population).

A "high risk" is any tree or tree part that demonstrates a high risk of failure or fracture which would result in damage or injury to people or property. Usually, high-risk trees demonstrate visible or otherwise detectable defects.

There are two distinct factors to the definition of a high risk tree: 1) a physical defect within a tree that increases its potential for failure, and 2) the proximity of the tree to people or property that increases the likelihood of personal injury or property damage. A decaying tree in the middle of the Superior National Forest may have a potential for failure, but the chance that tree will cause personal injury is remote. However, that same tree located on Davidson Road or anywhere in Brookfield, should be considered a high risk because of its urban location.

One task of the urban forest manager is to anticipate tree failures before they occur. There are no absolutes in determining hazards - only sound judgment based on experience at recognizing structurally unsound trees.

The number of trees marked for removal within a given year further describes a forest system's health, although in some instances trees need to be removed for reasons unrelated to health. The objective is to eventually have no city trees with a condition rating lower than fair.

The risk assessment that the Town of Brookfield should use to evaluate trees was created by the International Society of Arboriculture. It is titled A Photographic Guide to the Evaluation of Hazard Trees in Urban Areas, 2nd Edition by Nelda Matheny and James R. Clark. This can be purchased for \$45.00 at 1-888-472-8733.

During the inventory, trees that need to be removed were divided into two categories: immediate removals (attachment 3) and scheduled removals (attachment 5). Immediate removals are the trees that present the greatest danger. These trees may have large areas of decay in the trunk, extensive splitting, root damage, extensive dieback or other such problems. There are 22 immediate removals. These trees should be removed as soon as possible.

Scheduled removals are trees that are seriously declining and cannot be improved with pruning or small dead standing trees that present no immediate hazard of toppling. Five trees were identified as scheduled removals. These removals should begin following the immediate removals and immediate prunes.

When a tree has been labeled as in need of removal or safety pruning, it may indicate an underlying deficiency. For this reason, all trees labeled as removals along with trees in need of immediate or high priority prunings need to be inspected twice a year (once with the leaves on and once without the leaves) until the tree has been removed or the hazard has been eliminated. Likewise, all trees identified as in need of monitoring, poor or very poor or dead should also be inspected twice a year. A Certified Arborist should be contracted to complete this inspection. A schedule of all activities including safety removals, can be found as Attachment 1.

Certain policies regarding the removal and pruning of trees needs to be adopted by the Town. Standards and specifications provide detailed guidance regarding management practices. They are commonly used when municipalities hire a contractor or purchases materials, but should also be applied to all work completed by staff. Industry standards and specifications to reference should include:

~ American National Standard for Safety in Tree Care Operations, ANSI Z133 (current revision)

~ American National Standard for Tree Care Operations - Tree, Shrub and Other Woody Plant Maintenance - Standard Practices, ANSI A300 (current revision)

A notification procedure should be enacted to alert nearby residents of the impending removal. Not only does this alert them to the high risk situation, it helps residents feel involved in the decision and gives them time to adjust to the loss of the adjacent tree. The P & R Director can "mark" the tree and give the nearby homeowner written notification explaining why the tree is being removed, how the removal will be performed, when the removal will begin and if replanting will occur. Include a phone number where this representative can be contacted for any additional questions or concerns.

Objective B: Prune high risk trees.

A total of seven trees were identified as in need of safety pruning. These trees were broken into two categories: immediate prunes and high priority prunes.

Immediate prunes are trees with obvious risks such as hangers or significantly sized deadwood. These trees should be the first to be pruned as they present the greatest danger. Four trees were identified as immediate prunes (attachment 4). These should be pruned in conjunction with the immediate removals.

High priority prunes are trees with structural deficiencies or with a potentially dangerous situation developing. For example, a tree with crossed or congested limbs or a tree in the initial stages of dieback would be classified as high priority prunes. Three trees were identified as high priority prunes (attachment 6). These prunings should be performed in conjunction with the scheduled removals.

All pruning of trees 6" dbh and smaller can be completed in-house and over 6" dbh needs to be contracted out.

The inventory was completed from the ground and presents certain limitations. The trees have not been aerially inspected. A new and more severe set of circumstances may be noted from an aerial inspection. It is important that while trees are being pruned from an aerial bucket truck that their condition be re-evaluated. If the pruner feels they would not benefit from being pruned, they should be removed.

Objective C: Grind out existing stumps.

The twelve existing stumps identified during the inventory (attachment 7) need to be removed following the immediate and scheduled removals and the immediate and high priority prunings, but before the routine operations. Stumps also present a safety issue and are unsightly. Stumps should be ground out to 6" below grade, backfilled with topsoil and planted with grass seed.

All trees listed as as an immediate or scheduled removal should automatically have their stumps ground out as a part of the removal.

GOAL 2: Establish a routine, comprehensive urban forestry program.

Systematic maintenance of existing trees is important for three reasons: safety, cost savings and aesthetics. Maintained trees have a greater lifespan than trees that are not maintained and proper maintenance can reduce removal and replanting costs. On a limited budget, it is necessary to prioritize actions. High risk trees should always be eliminated first and then routine maintenance follow. The following routine objectives are listed from highest to lowest priority.

Objective A: Perform Yearly Tree Inspections & Evaluate the Risk Management Program.

It is important that *all* of the trees in the Town get a yearly inspection. Trees that have been identified during the inventory as needing immediate or high priority pruning or monitoring need to be inspected *twice* yearly. Complete this inspection once with leaf cover and once without until the hazard has been eliminated or the situation resolved. Until the trees labeled as "poor", "very poor" or "dead" can be removed they should be inspected several times a year. Additionally, all large diameter trees need an extra inspection after storms. These inspections can be completed simultaneously with the inspections discussed on page 16. If any hazards are identified, the situations need to be corrected immediately, then continue with the list of routine maintenance.

It is important that an ISA Certified Arborist complete the larger tree inspections (greater than 6" in diameter). The P & R Director is qualified to take the certification exam. The cost of the exam and the study guide have been calculated into the 'Year 2003 Schedule of Activities' (attachment 1). However, until he has successfully completed the exam, a Certified Arborist will need to be contracted with to complete the inspection. This figure has also been included in the 'Schedule of Activities.'

Seven factors should be considered when evaluating the smaller trees in-house and all trees. The factors along with positive and negative considerations are:

1. Crown development
 - ~ characteristic of species and well balanced
 - ~ branching throughout entire upper 2/3 of trunk area
 - ~ lacking full crown
2. Trunk
 - ~ one central leader is desired
 - ~ no defects
 - ~ missing sections of bark

- ~ extensive decay or hollow
- 3. Major branch structure
 - ~ evenly distributed branches
 - ~ structurally important branches not dead or broken
- 4. Twig growth rate
 - ~ typical for species and age
 - ~ growth rate reduced
- 5. Foliage
 - ~ normal size and color
 - ~ small leaves with deficiencies
- 6. Insects and disease
 - ~ no apparent problems
 - ~ severe infestation
- 7. Roots
 - ~ extensive root loss

To eliminate high risk situations within Brookfield, the P & R Director should evaluate the risk management program annually. This inventory and management plan represents the first comprehensive guide to risk abatement. This evaluation can be accomplished by following the Risk Management Guide (Attachment 14).

Another recommendation is to train regular and seasonal workers to maintain public trees and avoid harming them. Duties should include: watering trees that are less than 3 years planted, mulching trees as needed and performing training prunes for trees 10 years or younger. Helpful training sessions include safety courses on removals and equipment, training pruning techniques and large tree pruning techniques.

There are trees within the Town that are becoming over-mature and declining. Mulching and regular fertilizing may help increase the longevity and maintain the health of these older trees. A foliar and soil analysis should be completed prior to fertilizing so that the exact type and amount of fertilizer needed can be determined. Reasons to fertilize include: chlorotic leaves (yellow colored leaves during the growing season), heavy foot traffic around the tree and high salt areas.

Mulching is currently used on smaller trees in Brookfield. Mulching may be the single best advantage a young tree can have. Some benefits of mulching include:

- ~ Eliminates lawnmower and weed-whip damage.
- ~ Discourages weed growth.
- ~ Helps to retain moisture in soil.
- ~ Adds nutrients to soil as the mulch decomposes.
- ~ Facilitates increased root growth due to less compacted soil.

Often times mulch is described as “messy.” Lawnmowers scatter it around. Slowing down while mowing around mulch will eliminate this situation. Adding mulch as necessary to maintain a 2-4” depth and spread as widely as possible aids the tree itself and helps the mulch retain a “fresh” color. Mulch should be kept 6” from the trunk to help lessen fungal problems within the trunk flare region.

If Brookfield does not produce enough high-quality mulch to cover its needs, contact local tree care companies or utility companies. Often these companies have an excess of mulch material on their hands.

Objective B: Perform Training Prunes.

Training pruning is the structural pruning of all trees 10 years of age or younger. Some benefits of training pruning include:

- *Pruning 2-3 times in the first ten years of a tree's life will reduce 90% of the structural problems the tree will ever have.*
- *This is the easiest pruning to perform due to the small size of the trees.*
- *Training pruning is the most cost effective pruning because it reduces long-term routine pruning costs.*
- *It is the most economical pruning because it can be completed quickly, and efficiently by an in-house crew.*

Trees that are structurally pruned at this stage require much less care as they mature. Most older trees in Brookfield have not had the benefit of structural pruning and are now experiencing problems associated with this, such as suckers and dead limbs. It is not necessary that they be pruned every year but every-other is a good objective. This equates into 51 training prunes per year. All training prunes can be performed by the P & R Director and crew. Three times in the life of a 10 year old tree is typically sufficient (at 3, 7 and 10 years planted). Since Brookfield's staff will be performing more pruning, it would be beneficial to receive training in this area. Contact your regional urban forester or a consultant for this training.

Objective C: Perform routine pruning & removals.

One of the most beneficial and noticeable activities performed in the urban forest is routine pruning. Routine pruning is the cycle all trees over the age of 10 are placed on. Once all of the safety issues have been addressed, all trees 10 years of age or over (approximately 6” or over) need to be placed on a routine pruning cycle. Some benefits of routine pruning include:

- Increased health and viability of trees.
- Fewer tree mortalities and fewer structural deficiencies.
- Reduced liability from potential tree-related injuries or damages to property.
- Increased property values.
- Enhanced aesthetic value.
- Fewer complaints/requests.
- Increased longevity of tree.
- Reduced future costs associated with hazardous limbs and decay.
- Improved cost effectiveness of tree maintenance.

A feasible routine pruning cycle needs to be established. The Town has been broken into 5 work zones (attachment 12). Routine pruning should begin in zone 1 and continue in numeric order. One zone should be completed per year.

Completing one cycle, combined with increased emphasis on training prunes, should greatly reduce the cost and time associated with routine pruning. If a tree is pruned properly and is on a routine pruning cycle, no limb over 4" in diameter should need to be removed. The best time of year to prune is when the leaves are off the trees. If pruning does occur while the trees have their leaves on, it should be after the leaves have fully expanded and not when they are in the process of forming. Pruning should also be avoided when the leaves are turning colors in the fall and in the process of dropping. All American elms should be pruned during dormancy.

Oak wilt is an increasing problem in the state. Oaks occur frequently both in the street tree population and in private yards. *Do not cut, prune or otherwise wound oaks in the spring and early summer, generally from April 15-July 1.*

Taking into consideration Brookfield's current level of stocking, the above mentioned routine pruning cycle of five years is feasible. This cycle will result in approximately 94 trees being pruned per year.

It is important to note that the cost figure will likely decline after one complete rotation has been reached. Because of the lack of maintenance in the past, most all of the trees will need initial pruning. After one rotation has been completed, some of the trees will need less major pruning than in the initial cycle and the cost will be reduced.

Wisconsin Electric Power prunes underneath power lines to a safe level and then the Town finished the detail work. While there were only 31 trees with overhead power lines, it is important to continue coordinating all of these prunings with WEP.

Another facet of routine maintenance includes 'routine' tree removals. Any given city can expect approximately 2% of trees will need to be removed per year due to high risk situations. In Brookfield this calculates into a total of 11 removals per year. This has also been figured into the 5 year 'Schedule of Activities' that can be found as attachment 1.

A tree removal policy similar to the one listed below should be instituted. This policy should be applied equally to all residents. The purpose of the tree management program is to maintain trees on public property as long as they are healthy and safe. If an individual would like to remove a tree on public property, he or she should provide the following information to the P & R Director:

1. Name of person requesting removal.
2. Description and location of tree.
3. Reason for wanting removal.

Upon receiving such request, the Director will take these steps:

1. Evaluate the tree and make a recommendation.
2. Deliver the evaluation to the Tree Board and Town Board for their response.
3. Notify the person requesting removal of the Town decision.

The person requesting removal may hire, at his or her own expense, a forester or arborist to evaluate the tree and submit a report. The P & R Director needs to acknowledge and approve the qualifications of this forester or arborist hired by the homeowner. The hired forester or arborist should assess the health and safety of the tree and appraise its monetary value.

The final decision rests with the P & R Director. If permission is granted to remove a tree that is not diseased, high risk or dead, the property owner pays the full cost of contracting out the removal, including stump grinding, and makes a contribution to the Town tree program equal to the appraised value of the tree. The Town may plant a tree in a nearby vacant space according to the planting program.

Objective D: Plant high quality trees with low maintenance needs.

Establishing an ongoing forestry program includes planting new trees to fill available planting sites. However, no planting should take place until all of the hazardous situations identified have been alleviated. Then, the order of priority for tree planting should be:

1. *Trees lost within the past year.*
2. *Trees lost within the past three years.*
3. *Appropriate sites within the current work zone.*
4. *Homeowner requests.*

The Town will select and plant a tree at no cost to the adjacent property owner according to the above priority order, the homeowner request replacement policy and funds available. The following is a suggested guideline concerning homeowner requests.

HOMEOWNER REQUEST REPLACEMENT POLICY

To request a replacement tree, individuals should provide the following information to the Town:

1. Name, address and phone number of person requesting tree replacement.
2. If the tree was removed in the past, the location of tree that was removed and the year it was removed.
3. If not due to a removal, the reason for requesting a tree.

Upon receiving such a request, the P & R Director will take these steps:

1. Evaluate the site and make a recommendation about replacement species and location.
2. Decide if the site should be planted.
3. Notify the person requesting planting of the decision.

The final decision about tree planting on public property lies with the P & R Director. If the homeowners site wasn't chosen for planting within the next few years, he or she may, at their own cost hire a Town approved contractor to plant a tree. The site and species must be approved by the Town.

A cycle of planting should be initiated. The easiest and most logical method of planting is to use the same five zones identified for routine pruning, beginning in zone 1 and following numeric order. To determine the number of trees to be planted each year, the following equation was used:

$$100\% \text{ stocking in 5 years (1 rotation) + replacements} = 36 \text{ trees/year}$$
$$102 \text{ planting sites} + 27 \text{ immediate \& scheduled removals/5 years} + 11 \text{ routine removals/year} = 36 \text{ plantings}$$

This equation includes the current number of sites and removals and factors in future tree mortality. The only variable is the number of years to full stocking. Five years was selected because it coincides with the zone maintenance. It can be reduced or extended if the Town feels it is appropriate. Due to the long time frame involved, the actual number of years may vary depending on maintenance, insect and disease factors that may or may not occur.

There were 102 planting sites identified. Planting sites were chosen where adequate space existed. Overhead utilities and nearby existing trees and vegetation were also taken into consideration. No planting sites were identified where ditches are present. All of the 102 sites will allow for a large growing tree to be planted. The specific addresses can be found as attachment 10. Different plantings may be more appropriate for replacement plantings depending upon the size of the boulevard and overhead utility lines. Large sites are suitable for areas with a wide boulevard and no height considerations. Smaller sites are appropriate with overhead power lines or extremely small growing spaces. And medium sites are suitable when the boulevard is of medium width or high-transmission overhead power lines are present.

The following are general design guidelines for selecting species for planting:

1. Plant trees to define spaces and select species appropriate for the purposes served by each space.
2. Select trees for the community that have desirable forms, colors and textures.
3. Use plantings to emphasize major community pattern elements, particularly major streets.
4. Plant the same species or species of similar form and size on both sides of the street.
5. Match tree size to street width and the available space in the planting strip.
6. Space trees an appropriate distance apart:

| | |
|------------------------------|---------------------------------|
| Small trees (up to 30' tall) | planted at 25' offcenters |
| Medium trees (30 - 45' tall) | planted at 35 - 40' offcenters |
| Large trees (>45' tall) | planted at 45' - 50' offcenters |

7. Complement existing vegetation.
8. Match planting concept, tree size and spacing with the adjacent land use.
9. Do not plant coniferous (spruce, cedar, pine, etc.) trees within boulevard areas, regardless if there are sidewalks and curbs or not.

Partial Source: Urban and Community Forestry, A Guide for the Interior Western United States, USDA Forest Service, 1990

Brookfield's climate and soil types allow for some unique tree planting selections. Sound choices for larger trees include:

swamp white oak (*Quercus bicolor*)
Kentucky coffeetree (*Gymnocladus dioica*)
hackberry (*Celtis occidentalis*)
American Linden (*Tilia americana*)
bur oak (*Quercus macrocarpa*)
ginkgo (*Ginkgo biloba*)
catalpa (*Catalpa* spp.)

Good medium selections include:

flowering pear (*Pyrus* spp.)
Amur cork tree (*Phellodendron amurense* 'macho')
river birch (*Betula nigra*)
littleleaf linden (*Tilia cordata*)
amur chokecherry (*Prunus maackii*)
Trukish filbert (*Corylus colurna*)
lacebark elm (*Ulmus parvifolia*)
horsechestnuts (*Aesculus* spp.)

Smaller sites can be filled with:

Japanese tree lilac (*Syringa reticulata*)
serviceberry (*Amelanchier arborea*)
thornless cockspur hawthorn (*Crataegus crus-galli* 'inermis')
Eastern redbud (*Cercis canadensis*)
hophornbeam (*Ostrya virginiana*)
American hornbeam (*Carpinus caroliniana*)

Nothing larger than these trees should be planted under power lines. Do not plant wide trees, such as the hawthorn on narrow boulevards. They will grow out into the street. Additionally, do not plant trees too close to traffic signs and intersections. They will eventually grow and block these areas. Try to stay at least 40' away from these areas. Additionally, be sure not to plant trees too closely together.

A complete evaluation of the site needs to be completed before selecting a species. Additionally, "A Guide to Selecting Landscape Plants" by E.R. Hasselkus is an excellent publication to assist with selecting species. It can be purchased from the University of Wisconsin Extension Service.

It is important to diversify the urban forest as much as possible. Every effort should be made to continue diversification. Planting many different species and varieties keeps the urban forest healthy and attractive.

Ideally, no more than 10% of any one species and 20% of any one genus should comprise the Town's trees. It is important to note that while there was not a huge problem with

overplanting of any one species, some were right at the cutoff. Green ash represents 10.9% of the population, cottonwood 10.1% and blue spruce 9.6%. These trees should be planted in moderation as they are at or near the 10% cutoff.

Brookfield should create a list of trees not to be planted along boulevards. Some examples of poor species selection include: black locust (*Pseudoacacia robinia*), boxelder (*Acer negundo*), Siberian elm (*Ulmus pumila*), poplar (*Populus deltoides*.) and any coniferous trees (spruce, fir, cedar, pine, etc) . These deciduous trees are weak wooded causing limbs to “break out” often, are “messy”, dropping leaves and twigs continuously and aren’t particularly attractive. The conifers obstruct the view of pedestrians and vehicles and will grow to block off sidewalks and encroach onto the road.

Currently, all planting is performed in-house by the Town crew. Aside from too small of trees being planted, planting techniques appear to be fine. The P & R Director should continue to supervise the plantings and freshen mulch and water as needed. All planting should follow DNR planting specifications (Attachment 15) and the American National Standard for Nursery Stock, ANSI Z60 (current revision) should be used when purchasing plant material.

Objective E: Ensure an adequate budget for routine activities.

In 2002, the forestry budget is \$65,000 including grant funds and employee wages and benefits. The budget varies greatly from year to year. Based on inventory data a routine budget of \$8,900 for contracting/rental and \$11,750 for salaries is needed. So, a minimum of \$20,650 should be earmarked exclusively for forestry work. This budget will allow for the following items to be completed annually:

1. A tree survey of all trees
2. Eleven routine removals
3. Fifty-one training prunes
4. Ninety-four routine prunes
5. Thirty-six tree plantings
6. Small equipment upgrades
7. Staff training
8. Scheduling/ Supervising and other day-to-day operations

A more detailed breakdown of this can be found as the ‘Schedule of Activities’ (attachment 1).

All of this work will be completed in-house with a bucket truck and stump grinder being rented periodically. Because the crew will be completing more work, it is essential that they receive proper training on pruning, removals and especially safety precautions. The cost of training has been calculated in the proposed budget.

It is also essential that the crew and P & R Director be allotted the appropriate amount of time to complete these tasks. It will take approximately 612 hours/year to complete these activities. Considering that the appraised value of the forest is \$1.1 million, this is a very small amount of time to manage such an important resource.

Objective F: Inventory Maintenance and Updating.

Microsoft Excel was used for this inventory and it allows for continual updating of the inventory when any work is performed. Work orders (attachment 11) should be completed by the P & R Director or the crew that completed the work and inputted on a continuing basis by a specifically designated person. It is recommended that one person in the office be specifically chosen to input all of this data. Without continual updating in this way, the inventory quickly becomes obsolete. This management plan should be evaluated by the P & R Director as it is implemented on a yearly basis to assure the goals are being met and new goals are being developed.

This management plan contains provisions for the five years, beginning in 2003 and continuing through the year 2007. When the inventory expires in 2007, a qualified, experienced forester needs to thoroughly evaluate all of the trees on an individual basis again. If possible begin the 2003 work in 2002.

Tree risk situations can develop very quickly and certainly within five years, so it is imperative that *all* of the trees be inspected yearly by a qualified individual. This inspection should be completed prior to budget negotiations, so that an accurate forestry operations figure can be negotiated and secured in the next years budget. Special circumstances such as storm damage will require extra inspections.

Objective G: Other Considerations.

Community Education: The purpose of community education is to encourage landscaping on private property by providing information on the assets of landscaping and on the proper planting and care of trees and other vegetation. Some recommendations include:

- ~ Host annual tree care seminars.
- ~ Maintain a supply of educational material for distribution to the public. Some materials may be free of charge from the WI DNR.
- ~ Use the local newspaper to promote the tree program by periodically preparing a news release on tree topics such as: tree pruning, how to enter the poster contest, and how to winterize trees.
- ~ Distribute flyers when working in neighborhoods. Residents will not be surprised when they hear the buzz of chainsaws and will be more aware of the value of the urban forest.

~ Initiate a "Champion Tree Contest". Enlist school children to find Brookfield's biggest trees and award the participation and largest trees.

Wood Residue: Currently branches are chipped and then used for tree mulch and provided to residents free of charge. Boles cut into smaller pieces and made available to residents. After a time, the wood is taken to the dump. Chipping mulch is excellent. To avoid taking wood waste to the dump, a chipper or tub grinder could be rented periodically to grind the boles.

EXPLANATION OF INVENTORY TERMINOLOGY

To aid in understanding the attachments and management plan in general, the following is a brief explanation of the terminology used.

An example of an inventory entry is:

Address: 655
Ext:
Street: Ravenswood Hills East
Side: Left
Site: 3
Sidestreet: Davidson Road
Species: Littleleaf Linden
DBH: 14
Condition: Very Poor
Maintenance: Immediate Removal
Blvd: Unrestricted
Utility: No
Defects: Large Trunk Cavity
% Cond: 4
% Loc: 80
% Spec: 90
Dollar Value: \$1,196.42
Comments:

Comments:

Address: The address or house number is 655.

Ext: This is an address extension. If the house did not have a number, but was between 353 and 357, an "x" would appear with the 655 indicating that 655 is a fictional address, but the most logical one.

Street: This is the street name. The street here is Ravenswood Hills East.

Side: This represents the quad in which the tree or planting site is located. The choices are front, left, right or back. Side quads occur when the house is on a corner lot and a tree or planting site is present on the sidestreet.

Site: This is the third tree located at the address on that side of the lot. Trees are numbered from left to right starting at the lot line. Sidestreet trees are numbered from front to back.

Sidestreet: Sidestreets will only be named if the house is a corner lot and trees are found along the sidestreet. In this case the sidestreet is Davidson Road. This tree is at the address 655 Ravenswood Hills East, but is actually found on Davidson Road.

Species: Species were identified by common name. This is a littleleaf linden.

DBH: The diameter at breast height (4.5 feet above ground) is 14 inches.

Condition: Each tree is assigned one of the following based on certain criteria: Excellent, Good, Fair, Poor, Very Poor or Dead.

Maintenance: Each tree is assigned one of the following maintenance needs: routine prune, immediate removal, scheduled removal, immediate prune, high priority prune, training prune, plant or stump. This is an immediate removal.

Blvd: One of six boulevards were used: 4', 4-6', 6'+, unrestricted (no sidewalk present), median or park .

Utility: This indicates the presence of overhead power lines. It is "yes" or "no" situation.

Defects: Lists primary defects such as trunk cavity.

% Cond(ition), % Loc(action), % Spec(ies): These are ratings assigned to each tree to calculate dollar value. %Cond could be useful in prioritizing removals.

Dollar Value: A dollar value will be assigned based on the previous entry.

Comments: A general category used for any information. For instance you might see "School".

ATTACHMENT 1

Schedule of Activities

Schedule of Activities (Year 2003)

(One-time only activities)

| Activity | Responsible | # of Trees | # of Inches | Avg Dbh/tree | Work Time | Costs |
|---|-------------|------------|-------------|--------------|---|--|
| Complete All Immediate Removals* | In-house | 22 | 531 | 24" | 3 person crew 4 removals/day = 6 days 8 stumps/day = 3 days | Bucket Truck = \$1200 Stump Grinder = \$840 |
| Complete All Immediate Prunings* | In-house | 3 | 85 | 28" | 10 prunes/day = 1/2 day | Bucket Truck = \$200 |
| Complete All Scheduled Removals* | In-house | 5 | 64 | 13" | 5 removals/day = 1 day 10 stumps/day = 1/2 day | Bucket Truck = \$200 Stump Grinder = \$280 |
| Complete All High Priority Pruning* | In-house | 4 | 69 | 17" | 10 prunes/day = 1/2 day | Bucket Truck = \$200 |
| Complete Existing Stump Removals* | In-house | 12 | 234 | 14" | 10 stumps/day = 1/2 day | Stump Grinder = \$280 |
| Tree Survey | Contract | All | N/A | N/A | 40 hours \$50/hour | \$2,000 |
| Arborist Exam, Training & Small Equipment | N/A | N/A | N/A | N/A | On-going | \$500 |

TOTAL RENTAL / CONTRACT COST = \$5,700

TOTAL CREW / STAFF TIME INVESTMENT = 12 days for a 3 person crew = 36 total days

Crew cost - does not include equipment cost - (based on \$19.20/hr) for in-house work = \$5,529.60.

Dollar costs & salaries are in 2002 dollars and will only continue to increase. The hourly figure does NOT include benefits, it is merely an hourly rate.

* These lists can be found as attachments 3 - 7.

Estimated costs are derived from past equipment rentals. The figures are:

Bucket truck = \$200/day/week or \$385/day

Stump grinder = \$280/day

Routine Schedule of Activities (Year 2004)

Work to be completed in Zone I

| Activity | Responsible | # of Trees | # of Inches | Avg Dbh/tree | Work Time | Costs |
|--|-------------|------------|-------------|--------------|--|---|
| 3 person crew unless noted | | | | | | |
| Tree Survey | Contract | All | N/A | N/A | 40 hours \$50/hour | \$2,000 |
| Scheduling/Supervising & Other Misc. Activities | In-house | All | N/A | N/A | 1/2 day/week | N/A |
| Removals | In-house | 11 | N/A | N/A | 4 removals/day = 3 days 8 stumps/day = 1 1/2 days | Bucket Truck = \$600 Stump Grinder = \$560 |
| Training pruning* (trees 1-6" dbh) | In-house | 51 | 154 | 3" | 1 day 35 trees a day/person | N/A |
| Routine pruning (trees 7+ " dbh) | In-house | 94 | 1596 | 17" | 10 prunes/day = 10 days | Bucket Truck = \$2000 |
| Tree Planting* (100% stocking in 1 rotation (5 years) + replacements) | In-house | 36 | N/A | 1.5" - 2.0" | 20 trees/day = 2 days | \$90/tree = \$3,240 |
| Staff/Crew Training & Small Equipment | N/A | N/A | N/A | N/A | On-going | \$500 |

TOTAL RENTAL / CONTRACT COST = \$8,900

TOTAL CREW / STAFF TIME INVESTMENT = 612 hours

Crew cost - does not include equipment cost - (based on \$19.20/hr) for in-house work = \$11,750.40.

Dollar costs & salaries are in 2002 dollars and will only continue to increase. The hourly figure does NOT include benefits, it is merely an hourly rate.

* These lists can be found as attachments 9 & 10.

Estimated costs are derived from past equipment rentals. The figures are:

Bucket truck = \$200/day/week or \$385/day

Stump grinder = \$280/day

Routine Schedule of Activities (Year 2005)

Work to be completed in Zone 2

| Activity | Responsible | # of Trees | # of Inches | Avg Dbh / tree | Work Time | Costs |
|--|-------------|------------|-------------|----------------|--|---|
| 3 person crew unless noted | | | | | | |
| Tree Survey | Contract | All | N/A | N/A | 40 hours \$50/hour | \$2,000 |
| Scheduling/Supervising & Other Misc. Activities | In-house | All | N/A | N/A | 1/2 day/week | N/A |
| Removals | In-house | 11 | N/A | N/A | 4 removals/day = 3 days 8 stumps/day = 1 1/2 days | Bucket Truck = \$800 Stump Grinder = \$560 |
| Training pruning* (trees 1-6" dbh) | In-house | 51 | 154 | 3" | 1 day 35 trees a day/person | N/A |
| Routine pruning (trees 7+ " dbh) | In-house | 94 | 1596 | 17" | 10 prunes/day = 10 days | Bucket Truck = \$2000 |
| Tree Planting* (100% stocking in 1 rotation (5 years) + replacements) | In-house | 36 | N/A | 1.5" - 2.0" | 20 trees/day = 2 days | \$90/tree = \$3,240 |
| Staff/Crew Training & Small Equipment | N/A | N/A | N/A | N/A | On-going | \$500 |

TOTAL RENTAL / CONTRACT COST = \$8,900

TOTAL CREW / STAFF TIME INVESTMENT = 612 hours

Crew cost - does not include equipment cost - (based on \$19.20 / hr) for in-house work = \$11,750.40.

Dollar costs & salaries are in 2002 dollars and will only continue to increase. The hourly figure does NOT include benefits, it is merely an hourly rate.

* These lists can be found as attachments 9 & 10.

Estimated costs are derived from past equipment rentals. The figures are:

Bucket truck = \$200/day/week or \$385/day

Stump grinder = \$280/day

Routine Schedule of Activities (Year 2006)

Work to be completed in Zone 3

| Activity | Responsible | # of Trees | # of Inches | Avg Dbh/ tree | Work Time | Costs |
|--|-------------|------------|-------------|---------------|--|---|
| 3 person crew unless noted | | | | | | |
| Tree Survey | Contract | All | N/A | N/A | 40 hours \$50/hour | \$2,000 |
| Scheduling/Supervising & Other Misc. Activities | In-house | All | N/A | N/A | 1 1/2 day/week | N/A |
| Removals | In-house | 11 | N/A | N/A | 4 removals/day = 3 days 8 stumps/day = 1 1/2 days | Bucket Truck = \$600 Stump Grinder = \$560 |
| Training pruning* (trees 1-6" dbh) | In-house | 51 | 154 | 3" | 1 day 35 trees a day/person | N/A |
| Routine pruning (trees 7+ " dbh) | In-house | 94 | 1596 | 17" | 10 prunes/day = 10 days | Bucket Truck = \$2000 |
| Tree Planting* (100% stocking in 1 rotation (5 years) + replacements) | In-house | 36 | N/A | 1.5" - 2.0" | 20 trees/day = 2 days | \$90/tree = \$3,240 |
| Staff/Crew Training & Small Equipment | N/A | N/A | N/A | N/A | On-going | \$500 |

TOTAL RENTAL / CONTRACT COST = \$8,900

TOTAL CREW/ STAFF TIME INVESTMENT = 612 hours

Crew cost - does not include equipment cost - (based on \$19.20/hr) for in-house work = \$11,750.40.

Dollar costs & salaries are in 2002 dollars and will only continue to increase. The hourly figure does NOT include benefits, it is merely an hourly rate.

* These lists can be found as attachments 9 & 10.

Estimated costs are derived from past equipment rentals. The figures are:

Bucket truck = \$200/day/week or \$385/day

Stump grinder = \$280/day

Routine Schedule of Activities (Year 2007)

Work to be completed in Zone 4

| Activity | Responsible | # of Trees | # of Inches | Avg Dbh/tree | Work Time | Costs |
|--|-------------|------------|-------------|--------------|--|---|
| 3 person crew unless noted | | | | | | |
| Tree Survey | Contract | All | N/A | N/A | 40 hours \$50/hour | \$2,000 |
| Scheduling/Supervising & Other Misc. Activities | In-house | All | N/A | N/A | 1/2 day/week | N/A |
| Removals | In-house | 11 | N/A | N/A | 4 removals/day = 3 days 8 stumps/day = 1 1/2 days | Bucket Truck = \$600 Stump Grinder = \$660 |
| Training pruning* (trees 1-6" dbh) | In-house | 51 | 154 | 3" | 1 day 35 trees a day/person | N/A |
| Routine pruning (trees 7+ " dbh) | In-house | 94 | 1596 | 17" | 10 prunes/day = 10 days | Bucket Truck = \$2000 |
| Tree Planting* (100% stocking in 1 rotation (5 years) + replacements) | In-house | 36 | N/A | 1.5" - 2.0" | 20 trees/day = 2 days | \$90/tree = \$3,240 |
| Staff/Crew Training & Small Equipment | N/A | N/A | N/A | N/A | On-going | \$500 |

TOTAL RENTAL / CONTRACT COST = \$8,900

TOTAL CREW / STAFF TIME INVESTMENT = 612 hours

Crew cost - does not include equipment cost - (based on \$19.20/hr) for in-house work = \$11,750.40.

Dollar costs & salaries are in 2002 dollars and will only continue to increase. The hourly figure does NOT include benefits, it is merely an hourly rate.

* These lists can be found as attachments 9 & 10.

Estimated costs are derived from past equipment rentals. The figures are:

Bucket truck = \$200/day/week or \$385/day

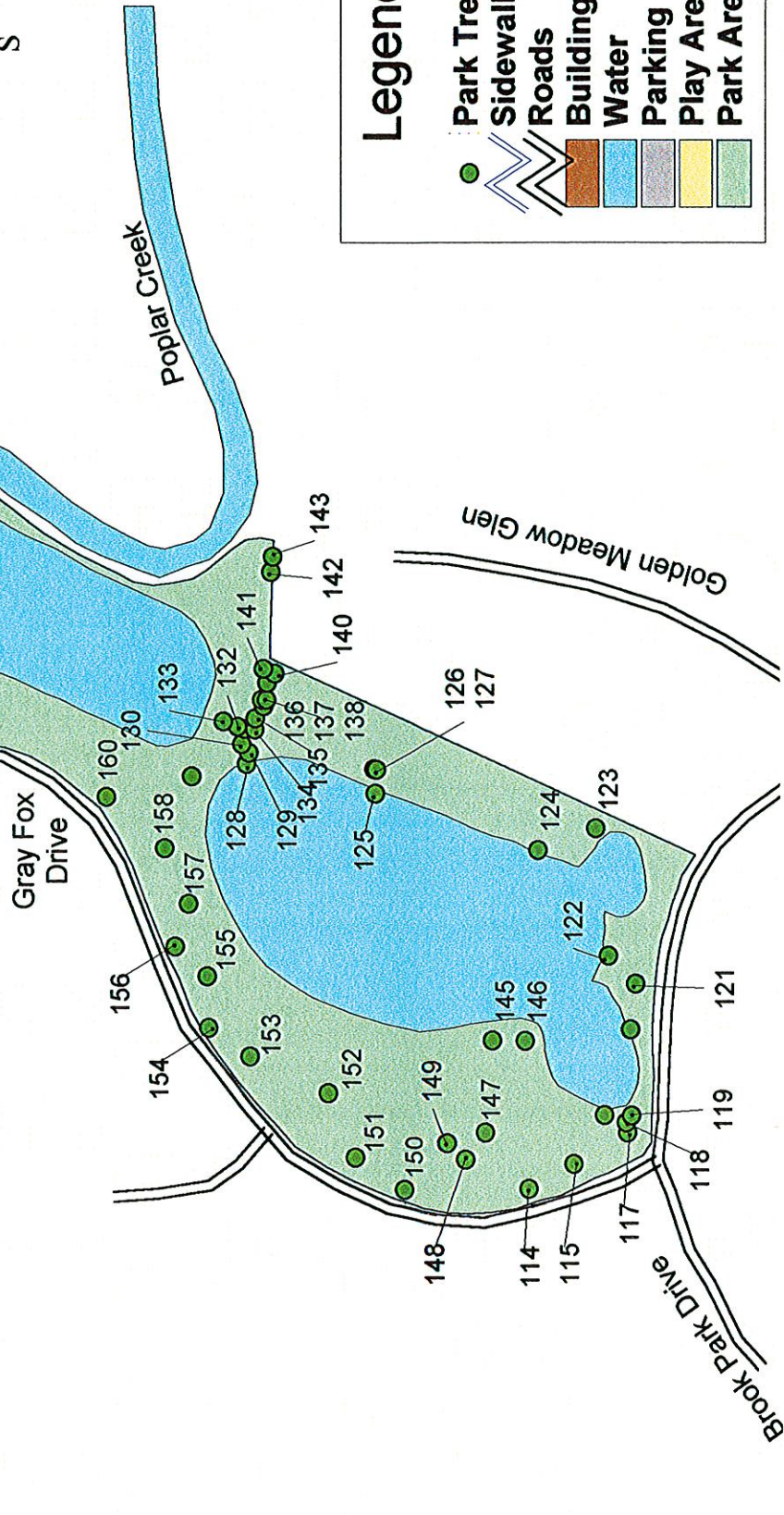
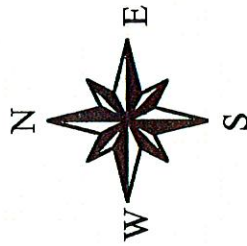
Stump grinder = \$280/day

ATTACHMENT 2

Park Maps

Brook Park

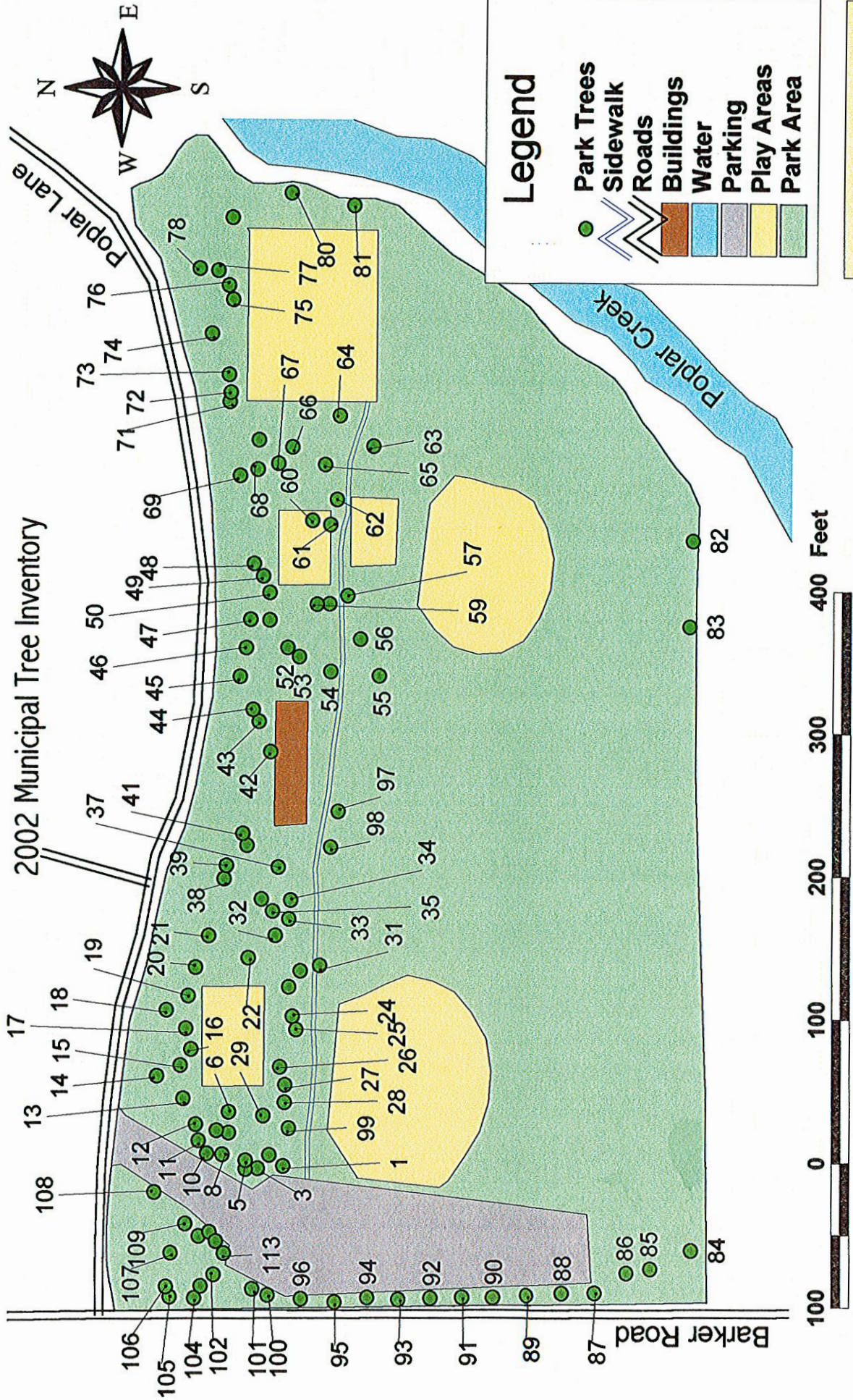
2002 Municipal Tree Inventory



Bluestem Forestry Consulting Inc.
Armstrong Creek, WI 54103

Town of Brookfield, WI

Marx Park



Wray Park

2001 Municipal Tree Inventory



100 0 100 200 300 400 Feet

Town of Brookfield, WI

Bluestem Forestry Consulting Inc.
Armstrong Creek, WI 54103

ATTACHMENT 3

Immediate Removals

Town of Brookfield

Immediate Removals
2001 May

| Address | Ext | Street | Side | Site | Sidestreet* | Species | DBH | Condition | Blvd | Utility | Defects | Marked |
|---------|-----|--------------------|-------|------|-------------|-------------------|-----|-----------|--------------|---------|------------------------------|--------------------------------|
| 143 | | Brook Park | | | | Corkscrew Willow | 30 | Very Poor | park | No | | |
| 760 | | N Brookfield Road | Front | 2 | | Sugar Maple | 27 | very poor | unrestricted | yes | extensive trunk decay | removed - road reconstruction? |
| 20550 | | Davidson Road | Front | 1 | | Shagbark Hickory | 30 | very poor | unrestricted | no | extensive trunk decay | next to home driveway, topped |
| 21275 | | Gumina Road | Front | 3 | | Boxelder | 21 | very poor | unrestricted | yes | crown and trunk decay | removed? |
| 4785 | | Lannon Road | Front | 1 | | Boxelder | 30 | very poor | unrestricted | no | severe dieback, trunk decay | near garage |
| 21755 | | Longview Drive | Front | 2 | | Siberian Elm | 29 | very poor | unrestricted | no | main leader has cavity | homeowner issue? |
| 21795 | | Longview Drive | Front | 2 | | Willow | 32 | very poor | unrestricted | no | severe dieback | short, little hazard |
| 75 | | Marx Park | | | | Scotch Pine | 8 | Dead | park | No | | removed |
| 21895 | | Mayrose Blvd | Front | 1 | | Cottonwood | 39 | very poor | unrestricted | no | large trunk cavity | possibly prune? |
| 785 | | Rackwood Ct | Front | 1 | | Sugar Maple | 27 | very poor | unrestricted | no | large trunk cavity | very poor condition, topped |
| 655 | | Ravenswood Hills E | Left | 3 | Davidson Rd | Littleleaf Linden | 14 | very poor | unrestricted | no | large trunk cavity | check ROW |
| 21150 | x | Watertown Road | Front | 2 | | Green Ash | 32 | very poor | unrestricted | no | basal decay, split | |
| 21190 | | Watertown Road | Front | 3 | | Green Ash | 19 | very poor | unrestricted | no | trunk cavity on back of tree | |

For removal January 2003

| | | | | | | | | | | | | | |
|-------|---|-----------------|-------|---|--|-----------------|----|-----------|--------------|-----|------------------------------|-----------|-------------------------------|
| 305 | x | S Brookfield Rd | Front | 8 | | Black Locust | 30 | very poor | unrestricted | no | major decay, cavity at union | immediate | marked by DPW |
| 343 | | S Brookfield Rd | Front | 2 | | Sugar Maple | 30 | very poor | unrestricted | no | trunk decay | immediate | marked by DPW |
| 640 | x | Kossow Road | Front | 1 | | Boxelder | 16 | very poor | unrestricted | no | trunk cavity | immediate | |
| 640 | x | Kossow Road | Front | 4 | | Boxelder | 24 | very poor | unrestricted | no | trunk cavity | immediate | |
| 1220 | | Summit Drive | Front | 1 | | Lombardy Poplar | 10 | dead | unrestricted | no | | immediate | in ditch |
| 21205 | | Weyer Road | Front | 7 | | American Elm | 13 | dead | unrestricted | no | Dutch elm disease | immediate | near gas line |
| 21290 | | Weyer Road | Front | 2 | | American Elm | | dead | unrestricted | no | | immediate | marked by DPW |
| 21895 | | Weyer Road | Front | | | American Elm | | dead | unrestricted | no | Dutch elm disease | immediate | |
| 4630 | | Lannon Road | Front | 1 | | Boxelder | 12 | dead | unrestricted | no | | immediate | along hedgerow, little hazard |
| 4705 | | Lannon Road | Front | 1 | | Sugar Maple | 32 | very poor | unrestricted | no | severe trunk decay | immediate | power lines, close to road |
| 21000 | | Gumina Road | Front | 1 | | | | dead | unrestricted | yes | | immediate | |
| 21130 | | Gumina Road | Front | 1 | | Silver Maple | 26 | dead | unrestricted | no | | immediate | |

Wray
Wray

Popular

topped
topped

Town of Brookfield

Immediate Removals
2001 May

| <u>Address</u> | <u>Ext</u> | <u>Street</u> | <u>Side</u> | <u>Site</u> | <u>Sidestreet</u> | <u>Species</u> | <u>DBH</u> | <u>Condition</u> | <u>Blvd</u> | <u>Utility</u> | <u>Defects</u> |
|----------------|------------|-----------------------|-------------|-------------|-------------------|-------------------|------------|------------------|--------------|----------------|------------------------------------|
| 143 | | Brook Park | | | | Corkscrew Willow | 30 | Very Poor | park | No | |
| 760 | | Brookfield Road North | Front | 2 | | Sugar Maple | 27 | very poor | unrestricted | yes | extensive trunk decay |
| 305 | x | Brookfield Road South | Front | 8 | | Black Locust | 30 | very poor | unrestricted | no | major trunk decay, cavity at union |
| 343 | | Brookfield Road South | Front | 2 | | Sugar Maple | 30 | very poor | unrestricted | no | trunk decay |
| 20560 | | Davidson Road | Front | 1 | | Shagbark Hickory | 30 | very poor | unrestricted | no | extensive trunk decay |
| 21130 | | Gumina Road | Front | 1 | | Silver Maple | 26 | dead | unrestricted | no | |
| 21275 | | Gumina Road | Front | 3 | | Boxelder | 21 | very poor | unrestricted | yes | crown and trunk decay |
| 640 | x | Kossow Road | Front | 1 | | Boxelder | 16 | very poor | unrestricted | no | trunk cavity |
| 640 | x | Kossow Road | Front | 4 | | Boxelder | 24 | very poor | unrestricted | no | trunk cavity |
| 4630 | | Lannon Road | Front | 1 | | Boxelder | 12 | dead | unrestricted | no | |
| 4705 | | Lannon Road | Front | 1 | | Sugar Maple | 32 | very poor | unrestricted | no | severe trunk decay |
| 4785 | | Lannon Road | Front | 1 | | Boxelder | 30 | very poor | unrestricted | no | severe dieback, trunk decay |
| 21755 | | Longview Drive | Front | 2 | | Siberian Elm | 29 | very poor | unrestricted | no | main leader has cavity |
| 21795 | | Longview Drive | Front | 2 | | Willow | 32 | very poor | unrestricted | no | severe dieback |
| 75 | | Marx Park | | | | Scotch Pine | 8 | Dead | park | No | |
| 21895 | | Mayrose Boulevard | Front | 1 | | Cottonwood | 39 | very poor | unrestricted | no | large trunk cavity |
| 785 | | Rackwood Court | Front | 1 | | Sugar Maple | 27 | very poor | unrestricted | no | large trunk cavity |
| 655 | | Ravenswood Hills East | Left | 3 | Davidson Road | Littleleaf Linden | 14 | very poor | unrestricted | no | large trunk cavity |
| 1220 | | Summit Drive | Front | 1 | | Lombardy Poplar | 10 | dead | unrestricted | no | |
| 21150 | x | Watertown Road | Front | 2 | | Green Ash | 32 | very poor | unrestricted | no | basal decay, split |
| 21190 | | Watertown Road | Front | 3 | | Green Ash | 19 | very poor | unrestricted | no | trunk cavity on back of tree |
| 21205 | | Weyer Road | Front | 7 | | American Elm | 13 | dead | unrestricted | no | Dutch elm disease |

ATTACHMENT 4

Immediate Prunes

Town of Brookfield

Immediate Prunes
2002 May

| <u>Address</u> | <u>Ext</u> | <u>Street</u> | <u>Side</u> | <u>Site</u> | <u>Sidestreet*</u> | <u>Species</u> | <u>DBH</u> | <u>Condition</u> | <u>Blvd</u> | <u>Utility</u> | <u>Defects</u> |
|----------------|------------|-----------------------|-------------|-------------|--------------------|------------------|------------|------------------|--------------|----------------|-------------------------------|
| 155 | | Brookfield Road South | Front | 1 | | Shagbark Hickory | 29 | good | unrestricted | no | dead branch stub |
| 48 | | Marx Park | | | | Cottonwood | 28 | Good | park | No | hanger |
| 21330 | x | Mary Lynn Drive | Front | 2 | | Green Ash | 28 | poor | unrestricted | no | decay on limb 14" in diameter |

ATTACHMENT 5

Scheduled Removals

Town of Brookfield

Scheduled Removals

2002 May

| <u>Address</u> | <u>Ext</u> | <u>Street</u> | <u>Side</u> | <u>Site</u> | <u>Sidestreet*</u> | <u>Species</u> | <u>DBH</u> | <u>Condition</u> | <u>Blvd</u> | <u>Utility</u> | <u>Defects</u> |
|----------------|------------|------------------|-------------|-------------|--------------------|----------------|------------|------------------|--------------|----------------|-----------------------|
| 21125 | | Betty Court | Front | 2 | | Black Cherry | 6 | poor | unrestricted | no | |
| 159 | | Brook Park | | | | Green Ash | 13 | Poor | park | No | |
| 20425 | | Brook Park Drive | Front | 1 | | Russian Olive | 24 | very poor | unrestricted | no | basal decay |
| 83 | | Marx Park | | | | Red Maple | 1 | Dead | park | No | |
| 167 | | Wray Park | | | | Black Cherry | 20 | Poor | park | No | trunk cavity, 2 stems |

ATTACHMENT 6

High Priority Prunes

Town of Brookfield

High Priority Prunes
2002 May

| <u>Address</u> | <u>Ext</u> | <u>Street</u> | <u>Side</u> | <u>Site</u> | <u>Sidestreet*</u> | <u>Species</u> | <u>DBH</u> | <u>Condition</u> | <u>Bld</u> | <u>Utility</u> | <u>Defects</u> |
|----------------|------------|---------------|-------------|-------------|--------------------|----------------|------------|------------------|--------------|----------------|----------------|
| 21125 | | Betty Court | Front | 1 | | Bur Oak | 12 | poor | unrestricted | no | |
| 16 | | Marx Park | | | | Siberian Elm | 17 | Good | park | No | |
| 20 | | Marx Park | | | | American Elm | 27 | Good | park | No | |
| 40 | | Marx Park | | | | Siberian Elm | 13 | Good | park | No | |

ATTACHMENT 7

Existing Stumps

Town of Brookfield

Stump Removals 2002 May

| <u>Address</u> | <u>Ext</u> | <u>Street</u> | <u>Side</u> | <u>Site</u> | <u>Sidestreet*</u> | <u>Species</u> | <u>DBH</u> | <u>Blvd</u> | <u>Utility</u> |
|----------------|------------|--------------------|-------------|-------------|--------------------|----------------|------------|--------------|----------------|
| 33 | | Marx Park | | | | Stump | 16 | park | No |
| 37 | | Marx Park | | | | Stump | 24 | park | No |
| 99 | | Marx Park | | | | Stump | 11 | park | No |
| 105 | | Marx Park | | | | Stump | 16 | park | No |
| 107 | | Marx Park | | | | Stump | 18 | park | No |
| 410 | | Allen Road South | Front | 1 | | Stump | 24 | unrestricted | no |
| 440 | | Poplar Creek Drive | Front | 1 | | Stump | 12 | unrestricted | no |
| 620 | | Kossow Road | Front | 4 | | Stump | 22 | unrestricted | no |
| 760 | | Barker Road North | Front | 1 | | Stump | 28 | unrestricted | yes |
| 775 | | Calico Court | Front | 2 | | Stump | 5 | unrestricted | no |
| 17950 | | Woolfel Road | Right | 1 | Wisconsin Avenue | Stump | 30 | unrestricted | no |
| 21805 | x | Davidson Road | Front | 1 | | Stump | 28 | unrestricted | yes |

ATTACHMENT 8

Trees that Need Monitored

Town of Brookfield

Monitors
2002 May

| <u>Address</u> | <u>Ext</u> | <u>Street</u> | <u>Side</u> | <u>Site</u> | <u>Sidestreet*</u> | <u>Species</u> | <u>DBH</u> | <u>Condition</u> | <u>Blvd</u> | <u>Utility</u> | <u>Defects</u> |
|----------------|------------|-----------------------|-------------|-------------|--------------------|------------------|------------|------------------|--------------|----------------|-----------------------------|
| 142 | | Brook Park | | | | Corkscrew Willow | 34 | Poor | park | No | |
| 305 | x | Brookfield Road South | Front | 4 | | Sugar Maple | 16 | poor | unrestricted | no | 2 leaders, split |
| 305 | x | Brookfield Road South | Front | 5 | | Hawthorn | 5 | fair | unrestricted | no | small trunk cavity |
| 21690 | | Davidson Road | Front | 1 | | Boxelder | 31 | poor | unrestricted | no | trunk decay |
| 21860 | x | Davidson Road | Front | 2 | | Sugar Maple | 28 | fair | unrestricted | no | basal decay in old stumps |
| 21860 | x | Davidson Road | Front | 1 | | Red Oak | 36 | poor | unrestricted | no | basal decay on back of tree |
| 17390 | | Follett Drive | Front | 1 | | Silver Maple | 25 | poor | unrestricted | no | severe trunk scarring |
| 180 | | Kossow Road | Front | 1 | | Boxelder | 24 | poor | unrestricted | no | trunk decay |
| 405 | | Kossow Road | Left | 1 | Greendale Drive | Boxelder | 16 | poor | unrestricted | no | decay at branch union |
| 620 | | Kossow Road | Front | 1 | | Boxelder | 28 | poor | unrestricted | no | trunk decay |
| 620 | | Kossow Road | Front | 2 | | Boxelder | 29 | poor | unrestricted | no | trunk decay |
| 60 | | Marx Park | | | | Cottonwood | 32 | Fair | park | No | 2 stems, trunk scar |
| 81 | | Marx Park | | | | Paper Birch | 4 | Poor | park | No | severe lawnmower damage |
| 97 | | Marx Park | | | | American Elm | 12 | Fair | park | No | large trunk scar |
| 21090 | | Mary Lynn Drive | Right | 1 | Jaclyn Drive | Cottonwood | 8 | poor | unrestricted | no | top gone |
| 21090 | | Mary Lynn Drive | Right | 2 | Jaclyn Drive | Cottonwood | 25 | very poor | unrestricted | no | old storm damage |
| 21090 | | Mary Lynn Drive | Right | 3 | Jaclyn Drive | Cottonwood | 14 | poor | unrestricted | no | leader damage |
| 21690 | | Mayrose Boulevard | Right | 1 | Harmony Circle | Bur Oak | 53 | good | unrestricted | no | |
| 21755 | | Mayrose Boulevard | Front | 1 | | Aspen | 12 | poor | unrestricted | no | basal decay |
| 21910 | | Oakmont Lane | Front | 1 | | Silver Maple | 18 | fair | unrestricted | no | basal decay |
| 19645 | x | Sommers Drive | Front | 1 | | Silver Maple | 5 | poor | unrestricted | no | large trunk scar |
| 21850 | x | Watertown Road | Front | 4 | | Siberian Elm | 30 | poor | unrestricted | yes | trunk decay |
| 21205 | | Weyer Road | Front | 2 | | Boxelder | 25 | poor | unrestricted | no | decline |
| 21565 | | Weyer Road | Left | 1 | Martha Lane | Boxelder | 26 | poor | unrestricted | no | weak union |
| 165 | | Wray Park | | | | Green Ash | 26 | Fair | park | No | basal decay, 4 stems |
| 173 | | Wray Park | | | | Willow | 35 | Poor | park | No | |

| <u>Address</u> | <u>Ext</u> | <u>Street</u> | <u>Side</u> | <u>Site</u> | <u>Sidestreet*</u> | <u>Species</u> | <u>DBH</u> | <u>Condition</u> | <u>Blvd</u> | <u>Utility</u> | <u>Defects</u> |
|----------------|------------|---------------|-------------|-------------|--------------------|----------------|------------|------------------|-------------|----------------|----------------|
| 180 | | Wray Park | | | | Willow | 50 | Poor | park | No | decay at union |
| 187 | | Wray Park | | | | Boxelder | 32 | Poor | park | No | decay at union |
| 188 | | Wray Park | | | | Willow | 35 | Very Poor | park | No | beaver damage |
| 189 | | Wray Park | | | | Willow | 35 | Very Poor | park | No | beaver damage |
| 190 | | Wray Park | | | | Cottonwood | 35 | Poor | park | No | 2 stems |
| 202 | | Wray Park | | | | Willow | 31 | Poor | park | No | split |
| 214 | | Wray Park | | | | Willow | 50 | Poor | park | No | split |

ATTACHMENT 9

Training Prunes

TOWN OF BROOKFIELD

Training Prunes

2002 May

| <u>Address</u> | <u>Ext</u> | <u>Street</u> | <u>Side</u> | <u>Site</u> | <u>Sidestreet*</u> | <u>Species</u> | <u>DBH</u> | <u>Condition</u> | <u>Blvd</u> | <u>Utility</u> | <u>Defects</u> |
|----------------|------------|-----------------------|-------------|-------------|--------------------|----------------|------------|------------------|--------------|----------------|------------------|
| 20945 | | Bramblewood Trail | Front | 2 | | Plum | 4 | fair | unrestricted | no | |
| 20945 | | Bramblewood Trail | Front | 3 | | Plum | 4 | fair | unrestricted | no | |
| 114 | | Brook Park | | | | Green Ash | 1 | Poor | park | No | |
| 115 | | Brook Park | | | | Green Ash | 1 | Excellent | park | No | |
| 117 | | Brook Park | | | | Crabapple | 3 | Excellent | park | No | |
| 118 | | Brook Park | | | | Crabapple | 3 | Excellent | park | No | |
| 119 | | Brook Park | | | | Crabapple | 3 | Excellent | park | No | |
| 120 | | Brook Park | | | | Green Ash | 2 | Fair | park | No | trunk scar |
| 121 | | Brook Park | | | | Honeylocust | 3 | Excellent | park | No | |
| 148 | | Brook Park | | | | Green Ash | 3 | Fair | park | No | lawnmower damage |
| 149 | | Brook Park | | | | Green Ash | 4 | Excellent | park | No | |
| 150 | | Brook Park | | | | Honeylocust | 3 | Fair | park | No | lawnmower damage |
| 151 | | Brook Park | | | | Honeylocust | 5 | Excellent | park | No | |
| 154 | | Brook Park | | | | Green Ash | 3 | Good | park | No | lawnmower damage |
| 155 | | Brook Park | | | | Honeylocust | 4 | Excellent | park | No | |
| 156 | | Brook Park | | | | Green Ash | 1 | Poor | park | No | trunk damage |
| 160 | | Brook Park | | | | Green Ash | 2 | Good | park | No | |
| 20520 | | Brook Park Drive | Front | 1 | | Boxelder | 4 | good | unrestricted | no | |
| 20520 | | Brook Park Drive | Front | 3 | | Crabapple | 4 | excellent | unrestricted | no | |
| 20520 | | Brook Park Drive | Front | 5 | | Boxelder | 5 | excellent | unrestricted | no | |
| 385 | | Brookfield Road South | Front | 1 | | Black Walnut | 4 | excellent | unrestricted | no | |
| 385 | | Brookfield Road South | Front | 2 | | Black Walnut | 5 | excellent | unrestricted | no | |
| 385 | | Brookfield Road South | Front | 3 | | Black Walnut | 4 | good | unrestricted | no | |
| 775 | | Calico Court | Front | 1 | | Crabapple | 8 | good | unrestricted | no | |
| 855 | | Calico Court | Front | 1 | | Amur Maple | 8 | excellent | unrestricted | no | |
| 21820 | | Doneswood Drive | Front | 1 | | Honeylocust | 5 | excellent | unrestricted | no | |

| <u>Address</u> | <u>Ext</u> | <u>Street</u> | <u>Side</u> | <u>Site</u> | <u>Sidestreet*</u> | <u>Species</u> | <u>DBH</u> | <u>Condition</u> | <u>Blvd</u> | <u>Utility</u> | <u>Defects</u> |
|----------------|------------|---------------------|-------------|-------------|--------------------|----------------|------------|------------------|--------------|----------------|------------------|
| 845 | | Golden Meadow Glen | Front | 1 | | Flowering Pear | 5 | excellent | unrestricted | no | |
| 960 | | Greenridge Terrace | Front | 1 | | Cottonwood | 2 | good | unrestricted | no | many leaders |
| 1040 | | Greenridge Terrace | Front | 1 | | Flowering Pear | 3 | excellent | unrestricted | no | |
| 1125 | | Greenridge Terrace | Front | 1 | | Norway Maple | 5 | good | unrestricted | no | lawnmower damage |
| 1125 | | Greenridge Terrace | Front | 2 | | Norway Maple | 4 | good | unrestricted | no | lawnmower damage |
| 1255 | | Hawthorne Ridge Dr. | Front | 1 | | Crabapple | 4 | good | unrestricted | no | |
| 21020 | | Heatherview Dr. | Front | 2 | | Crabapple | 3 | good | unrestricted | no | |
| 20925 | | Highland Pass | Front | 2 | | Crabapple | 2 | excellent | unrestricted | no | |
| 21020 | | Highland Pass | Front | 1 | | Crabapple | 6 | good | unrestricted | no | lawnmower damage |
| 1470 | | Jaclyn Drive | Front | 1 | | Flowering Pear | 1 | excellent | unrestricted | no | |
| 1470 | | Jaclyn Drive | Front | 2 | | Flowering Pear | 3 | excellent | unrestricted | no | |
| 1470 | | Jaclyn Drive | Front | 3 | | Flowering Pear | 1 | excellent | unrestricted | no | |
| 20101 | | Marcus Drive | Front | 2 | | Crabapple | 2 | excellent | median | no | |
| 20101 | | Marcus Drive | Front | 3 | | Crabapple | 2 | excellent | median | no | |
| 20101 | | Marcus Drive | Front | 4 | | Crabapple | 2 | excellent | median | no | |
| 20101 | | Marcus Drive | Front | 5 | | Crabapple | 2 | excellent | median | no | |
| 20101 | | Marcus Drive | Front | 6 | | Crabapple | 2 | excellent | median | no | |
| 20101 | | Marcus Drive | Front | 7 | | Crabapple | 2 | excellent | median | no | |
| 20101 | | Marcus Drive | Front | 8 | | Crabapple | 2 | excellent | median | no | |
| 20101 | | Marcus Drive | Front | 1 | | Honeylocust | 4 | excellent | median | no | |
| 14 | | Marx Park | | | | Red Maple | 4 | Excellent | park | No | basal scar |
| 18 | | Marx Park | | | | Red Maple | 4 | Excellent | park | No | lean |
| 21 | | Marx Park | | | | Red Maple | 4 | Good | park | No | |
| 82 | | Marx Park | | | | Red Maple | 1 | Good | park | No | |
| 84 | | Marx Park | | | | Green Ash | 1 | Good | park | No | |
| 85 | | Marx Park | | | | Red Maple | 1 | Fair | park | No | |
| 86 | | Marx Park | | | | Green Ash | 1 | Fair | park | No | |
| 87 | | Marx Park | | | | Norway Maple | 2 | Poor | park | No | |
| 88 | | Marx Park | | | | Norway Maple | 2 | Good | park | No | |
| 89 | | Marx Park | | | | Norway Maple | 2 | Excellent | park | No | |
| 90 | | Marx Park | | | | Norway Maple | 2 | Excellent | park | No | |
| 91 | | Marx Park | | | | Norway Maple | 2 | Fair | park | No | |
| 92 | | Marx Park | | | | Norway Maple | 2 | Fair | park | No | |

| <u>Address</u> | <u>Ext</u> | <u>Street</u> | <u>Side</u> | <u>Site</u> | <u>Sidestreet*</u> | <u>Species</u> | <u>DBH</u> | <u>Condition</u> | <u>Blvd</u> | <u>Utility</u> | <u>Defects</u> |
|----------------|------------|-----------------------|-------------|-------------|--------------------|-----------------------|------------|------------------|--------------|----------------|----------------------|
| 93 | | Marx Park | | | | White Cedar/Arbovitae | 2 | Poor | park | No | |
| 94 | | Marx Park | | | | Norway Maple | 2 | Fair | park | No | |
| 95 | | Marx Park | | | | Norway Maple | 2 | Good | park | No | |
| 96 | | Marx Park | | | | Norway Maple | 2 | Good | park | No | |
| 21825 | | Oakmont Lane | Front | 1 | | Norway Maple | 1 | excellent | unrestricted | no | |
| 21180 | | Sierra Drive | Front | 1 | | Hawthorn | 6 | excellent | unrestricted | no | |
| 21195 | | Sierra Drive | Front | 4 | | Boxelder | 4 | good | unrestricted | no | |
| 20645 | | Sundance Drive | Front | 1 | | Crabapple | 2 | excellent | unrestricted | no | |
| 20801 | x | Swenson Drive | Front | 1 | | Green Ash | 4 | poor | unrestricted | no | |
| 20801 | x | Swenson Drive | Front | 3 | | Green Ash | 3 | good | unrestricted | no | |
| 20075 | | Water Tower Boulevard | Front | 1 | | Honeylocust | 3 | excellent | median | no | |
| 20075 | | Water Tower Boulevard | Front | 2 | | Honeylocust | 3 | excellent | median | no | |
| 20075 | | Water Tower Boulevard | Front | 3 | | Honeylocust | 3 | excellent | median | no | |
| 20075 | | Water Tower Boulevard | Front | 4 | | Honeylocust | 3 | excellent | median | no | |
| 20075 | | Water Tower Boulevard | Front | 5 | | Honeylocust | 3 | excellent | median | no | |
| 20075 | | Water Tower Boulevard | Front | 6 | | Honeylocust | 3 | excellent | median | no | |
| 20205 | x | Water Tower Boulevard | Front | 1 | | Crabapple | 3 | excellent | median | no | |
| 20205 | x | Water Tower Boulevard | Front | 2 | | Crabapple | 3 | excellent | median | no | |
| 20205 | x | Water Tower Boulevard | Front | 3 | | Crabapple | 3 | excellent | median | no | |
| 20215 | x | Water Tower Boulevard | Front | 1 | | Honeylocust | 2 | excellent | median | no | |
| 20215 | x | Water Tower Boulevard | Front | 3 | | Honeylocust | 2 | excellent | median | no | |
| 20215 | x | Water Tower Boulevard | Front | 4 | | Honeylocust | 2 | excellent | median | no | |
| 20215 | x | Water Tower Boulevard | Front | 5 | | Honeylocust | 2 | excellent | median | no | |
| 20215 | x | Water Tower Boulevard | Front | 6 | | Honeylocust | 2 | excellent | median | no | |
| 20215 | x | Water Tower Boulevard | Front | 7 | | Honeylocust | 2 | excellent | median | no | |
| 20225 | | Water Tower Boulevard | Front | 1 | | Honeylocust | 1 | excellent | median | no | |
| 20225 | | Water Tower Boulevard | Front | 2 | | Honeylocust | 1 | excellent | median | no | |
| 20225 | | Water Tower Boulevard | Front | 3 | | Honeylocust | 1 | excellent | median | no | |
| 20225 | | Water Tower Boulevard | Front | 4 | | Honeylocust | 1 | excellent | median | no | |
| 20225 | | Water Tower Boulevard | Front | 5 | | Honeylocust | 1 | excellent | median | no | |
| 20225 | | Water Tower Boulevard | Front | 6 | | Honeylocust | 4 | poor | median | no | leader dead, suckers |
| 20225 | | Water Tower Boulevard | Front | 7 | | Honeylocust | 2 | excellent | median | no | |
| 20350 | | Water Tower Boulevard | Front | 1 | | Crabapple | 2 | fair | median | no | minor dieback |

| <u>Address</u> | <u>Ext</u> | <u>Street</u> | <u>Side</u> | <u>Site</u> | <u>Sidestreet*</u> | <u>Species</u> | <u>DBH</u> | <u>Condition</u> | <u>Blvd</u> | <u>Utility</u> | <u>Defects</u> |
|----------------|------------|-----------------------|-------------|-------------|--------------------|------------------------|------------|------------------|-------------|----------------|----------------|
| 20350 | | Water Tower Boulevard | Front | 2 | | White Cedar/Arborvitae | 11 | fair | median | no | minor dieback |
| 20350 | | Water Tower Boulevard | Front | 3 | | White Cedar/Arborvitae | 11 | fair | median | no | minor dieback |
| 192 | | Wray Park | | | | Honeylocust | 2 | Excellent | park | No | |
| 193 | | Wray Park | | | | Honeylocust | 2 | Excellent | park | No | |
| 203 | | Wray Park | | | | Crabapple | 4 | Excellent | park | No | |
| 204 | | Wray Park | | | | Crabapple | 4 | Excellent | park | No | |
| 205 | | Wray Park | | | | Crabapple | 3 | Excellent | park | No | |
| 209 | | Wray Park | | | | Green Ash | 2 | Excellent | park | No | |
| 210 | | Wray Park | | | | Green Ash | 2 | Excellent | park | No | |
| 211 | | Wray Park | | | | Green Ash | 2 | Excellent | park | No | |
| 212 | | Wray Park | | | | Green Ash | 2 | Excellent | park | No | |

ATTACHMENT 10

Planting Sites

Town of Brookfield

Planting Sites
2002 May

| <u>Address</u> | <u>Ext</u> | <u>Street</u> | <u>Side</u> | <u>Site</u> | <u>Sidestreet*</u> | <u>Species</u> | <u>Bld</u> | <u>Utility</u> |
|----------------|------------|-------------------|-------------|-------------|---------------------|-----------------------|--------------|----------------|
| 1180 | | Boxwood Ct. | Front | 1 | | Planting Site - Large | unrestricted | no |
| 1220 | | Boxwood Ct. | Right | 1 | Hawthorne Ridge Ct. | Planting Site - Large | unrestricted | no |
| 20920 | | Bramblewood Trail | Front | 1 | | Planting Site - Large | unrestricted | no |
| 20945 | | Bramblewood Trail | Front | 1 | | Planting Site - Large | unrestricted | no |
| 21000 | | Bramblewood Trail | Front | 1 | | Planting Site - Large | unrestricted | no |
| 21020 | | Bramblewood Trail | Front | 1 | | Planting Site - Large | unrestricted | no |
| 1045 | | Briarcliff Trail | Front | 1 | | Planting Site - Large | unrestricted | no |
| 1065 | | Briarcliff Trail | Front | 1 | | Planting Site - Large | unrestricted | no |
| 1110 | | Briarcliff Trail | Front | 1 | | Planting Site - Large | unrestricted | no |
| 20400 | | Brook Park Drive | Front | 1 | | Planting Site - Large | unrestricted | no |
| 20420 | | Brook Park Drive | Front | 1 | | Planting Site - Large | unrestricted | no |
| 20420 | | Brook Park Drive | Front | 2 | | Planting Site - Large | unrestricted | no |
| 20705 | | Brook Park Drive | Front | 1 | | Planting Site - Large | unrestricted | no |
| 20955 | | Brook Park Drive | Front | 1 | | Planting Site - Large | unrestricted | no |
| 20955 | | Brook Park Drive | Front | 2 | | Planting Site - Large | unrestricted | no |
| 21000 | | Brook Park Drive | Front | 1 | | Planting Site - Large | unrestricted | no |
| 810 | | Calico Court | Front | 1 | | Planting Site - Large | unrestricted | no |
| 920 | | Calico Court | Front | 1 | | Planting Site - Large | unrestricted | no |
| 2140 | | Davidson Road | Front | 1 | | Planting Site - Large | 6'+ | no |
| 2140 | | Davidson Road | Front | 2 | | Planting Site - Large | 6'+ | no |
| 2140 | | Davidson Road | Front | 3 | | Planting Site - Large | 6'+ | no |
| 2140 | | Davidson Road | Front | 4 | | Planting Site - Large | 6'+ | no |
| 2140 | | Davidson Road | Front | 5 | | Planting Site - Large | 6'+ | no |
| 2140 | | Davidson Road | Front | 6 | | Planting Site - Large | 6'+ | no |
| 2140 | | Davidson Road | Front | 7 | | Planting Site - Large | 6'+ | no |
| 2140 | | Davidson Road | Front | 8 | | Planting Site - Large | 6'+ | no |

| <u>Address</u> | <u>Ext</u> | <u>Street</u> | <u>Side</u> | <u>Site</u> | <u>Sidestreet*</u> | <u>Species</u> | <u>Blvd</u> | <u>Utility</u> |
|----------------|------------|---------------------|-------------|-------------|--------------------|-----------------------|--------------|----------------|
| 2140 | | Davidson Road | Front | 9 | | Planting Site - Large | 6+ | no |
| 2140 | | Davidson Road | Front | 10 | | Planting Site - Large | 6+ | no |
| 2140 | | Davidson Road | Front | 11 | | Planting Site - Large | 6+ | no |
| 2140 | | Davidson Road | Front | 12 | | Planting Site - Large | 6+ | no |
| 2140 | | Davidson Road | Front | 13 | | Planting Site - Large | 6+ | no |
| 21800 | | Foxhaven Run | Front | 1 | | Planting Site - Large | inrestricted | no |
| 21840 | | Foxhaven Run | Front | 1 | | Planting Site - Large | inrestricted | no |
| 905 | | Golden Meadow Glen | Front | 1 | | Planting Site - Large | inrestricted | no |
| 1005 | | Gray Fox Dr. | Front | 1 | | Planting Site - Large | inrestricted | no |
| 1185 | | Gray Fox Dr. | Front | 1 | | Planting Site - Large | inrestricted | no |
| 1185 | | Gray Fox Dr. | Front | 2 | | Planting Site - Large | inrestricted | no |
| 995 | | Greenridge Terrace | Front | 1 | | Planting Site - Large | inrestricted | no |
| 1040 | | Greenridge Terrace | Right | 1 | Highland Pass | Planting Site - Large | inrestricted | no |
| 1040 | | Greenridge Terrace | Front | 2 | | Planting Site - Large | inrestricted | no |
| 21105 | | Greenridge Terrace | Right | 1 | Greenridge Terrace | Planting Site - Large | inrestricted | no |
| 20880 | | Hawthorne Ridge Ct. | Front | 1 | | Planting Site - Large | inrestricted | no |
| 20885 | | Hawthorne Ridge Ct. | Front | 1 | | Planting Site - Large | inrestricted | no |
| 20885 | | Hawthorne Ridge Ct. | Front | 2 | | Planting Site - Large | inrestricted | no |
| 1080 | | Hawthorne Ridge Dr. | Front | 1 | | Planting Site - Large | inrestricted | no |
| 1140 | | Hawthorne Ridge Dr. | Front | 1 | | Planting Site - Large | inrestricted | no |
| 1200 | | Hawthorne Ridge Dr. | Front | 1 | | Planting Site - Large | inrestricted | no |
| 1205 | | Hawthorne Ridge Dr. | Front | 1 | | Planting Site - Large | inrestricted | no |
| 1260 | | Hawthorne Ridge Dr. | Front | 1 | | Planting Site - Large | inrestricted | no |
| 1260 | | Hawthorne Ridge Dr. | Front | 2 | | Planting Site - Large | inrestricted | no |
| 1275 | | Hawthorne Ridge Dr. | Front | 2 | | Planting Site - Large | inrestricted | no |
| 1320 | | Hawthorne Ridge Dr. | Left | 1 | Mary Lynn Dr. | Planting Site - Large | inrestricted | no |
| 1320 | | Hawthorne Ridge Dr. | Front | 1 | | Planting Site - Large | inrestricted | no |
| 1325 | | Hawthorne Ridge Dr. | Right | 1 | Mary Lynn Dr. | Planting Site - Large | inrestricted | no |
| 20845 | | Heatherview Dr. | Front | 1 | | Planting Site - Large | inrestricted | no |
| 20860 | | Heatherview Dr. | Front | 1 | | Planting Site - Large | inrestricted | no |
| 20925 | | Heatherview Dr. | Front | 1 | | Planting Site - Large | inrestricted | no |
| 20930 | | Heatherview Dr. | Front | 1 | | Planting Site - Large | inrestricted | no |
| 20945 | | Heatherview Dr. | Front | 1 | | Planting Site - Large | inrestricted | no |

| <u>Address</u> | <u>Ext</u> | <u>Street</u> | <u>Side</u> | <u>Site</u> | <u>Sidestreet*</u> | <u>Species</u> | <u>Blvd</u> | <u>Utility</u> |
|----------------|------------|-------------------|-------------|-------------|--------------------|-----------------------|--------------|----------------|
| 21025 | | Heatherview Dr. | Front | 1 | | Planting Site - Large | unrestricted | no |
| 975 | | Highland Pass | Front | 1 | | Planting Site - Large | unrestricted | no |
| 21065 | | Highland Pass | Right | 1 | Oak Ridge Court | Planting Site - Large | unrestricted | no |
| 21105 | | Highland Pass | Front | 1 | | Planting Site - Large | unrestricted | no |
| 21185 | | Highland Pass | Right | 1 | Greenridge Terrace | Planting Site - Large | unrestricted | no |
| 20505 | | Hunters Run | Front | 1 | | Planting Site - Large | unrestricted | no |
| 20505 | | Hunters Run | Front | 2 | | Planting Site - Large | unrestricted | no |
| 20560 | | Hunters Run | Front | 1 | | Planting Site - Large | unrestricted | no |
| 20700 | | Hunters Run | Front | 1 | | Planting Site - Large | unrestricted | no |
| 20760 | | Hunters Run | Front | 1 | | Planting Site - Large | unrestricted | no |
| 20805 | | Hunters Run | Front | 1 | | Planting Site - Large | unrestricted | no |
| 20920 | | Hunters Run | Front | 1 | | Planting Site - Large | unrestricted | no |
| 745 | x | Mary Rose Court | Front | 1 | | Planting Site - Large | unrestricted | no |
| 755 | | Mary Rose Court | Front | 1 | | Planting Site - Large | unrestricted | no |
| 21705 | | Mayrose Boulevard | Front | 1 | | Planting Site - Large | median | no |
| 21705 | | Mayrose Boulevard | Front | 2 | | Planting Site - Large | median | no |
| 21705 | | Mayrose Boulevard | Front | 3 | | Planting Site - Large | median | no |
| 21705 | | Mayrose Boulevard | Front | 4 | | Planting Site - Large | median | no |
| 21705 | | Mayrose Boulevard | Front | 5 | | Planting Site - Large | median | no |
| 21705 | | Mayrose Boulevard | Front | 6 | | Planting Site - Large | median | no |
| 21705 | | Mayrose Boulevard | Front | 7 | | Planting Site - Large | median | no |
| 21705 | | Mayrose Boulevard | Front | 8 | | Planting Site - Large | median | no |
| 21705 | | Mayrose Boulevard | Front | 9 | | Planting Site - Large | median | no |
| 21705 | | Mayrose Boulevard | Front | 10 | | Planting Site - Large | median | no |
| 21705 | | Mayrose Boulevard | Front | 11 | | Planting Site - Large | median | no |
| 21705 | | Mayrose Boulevard | Front | 12 | | Planting Site - Large | median | no |
| 21705 | | Mayrose Boulevard | Front | 13 | | Planting Site - Large | median | no |
| 21705 | | Mayrose Boulevard | Front | 14 | | Planting Site - Large | median | no |
| 21705 | | Mayrose Boulevard | Front | 15 | | Planting Site - Large | median | no |
| 21945 | | Mayrose Boulevard | Front | 1 | | Planting Site - Large | median | no |
| 21945 | | Mayrose Boulevard | Front | 2 | | Planting Site - Large | median | no |
| 21945 | | Mayrose Boulevard | Front | 3 | | Planting Site - Large | median | no |
| 22035 | | Peterhill Court | Front | 1 | | Planting Site - Large | unrestricted | no |

| <u>Address</u> | <u>Ext</u> | <u>Street</u> | <u>Side</u> | <u>Site</u> | <u>Sidestreet*</u> | <u>Species</u> | <u>Blvd</u> | <u>Utility</u> |
|----------------|------------|------------------|-------------|-------------|--------------------|-----------------------|--------------|----------------|
| 22070 | | Peterhill Court | Front | 1 | | Planting Site - Large | inrestricter | no |
| 22075 | | Peterhill Court | Front | 1 | | Planting Site - Large | inrestricter | no |
| 1325 | | Pioneer Trail | Front | 2 | | Planting Site - Large | inrestricter | no |
| 1365 | | Poplar Ridge Ct. | Right | 1 | Mary Lynn Dr. | Planting Site - Large | inrestricter | no |
| 1110 | | Springdale Road | Front | 1 | | Planting Site - Large | inrestricter | no |
| 1140 | | Springdale Road | Front | 1 | | Planting Site - Large | inrestricter | no |
| 1155 | | Springdale Road | Front | 1 | | Planting Site - Large | inrestricter | no |
| 1045 | | Thorn Ridge Ct. | Front | 1 | | Planting Site - Large | inrestricter | no |
| 895 | | Timber Pass | Front | 1 | | Planting Site - Large | inrestricter | no |
| 895 | | Timber Pass | Left | 1 | Heatherview Drive | Planting Site - Large | inrestricter | no |

ATTACHMENT 11

Sample Work Order

Work Order Completed

Date Work Requested: _____

Date Work Completed: _____

Work Completed By: _____

Address: _____ Side: _____ Site: _____

Type of Work Performed: _____

Additional Work Needed: _____

End Condition of Tree: Excellent Good Fair Poor Very Poor Dead

Date Work Requested: _____

Date Work Completed: _____

Work Completed By: _____

Address: _____ Side: _____ Site: _____

Type of Work Performed: _____

Additional Work Needed: _____

End Condition of Tree: Excellent Good Fair Poor Very Poor Dead

Date Work Requested: _____

Date Work Completed: _____

Work Completed By: _____

Address: _____ Side: _____ Site: _____

Type of Work Performed: _____

Additional Work Needed: _____

End Condition of Tree: Excellent Good Fair Poor Very Poor Dead

ATTACHMENT 12

Map with Zones Delineated

N-23

G

N-17

H

N-12

J

N-7

K

N-1
S-1

L

M

Zone 2 = Wray & Brook Parks

Zone 4

Zone 3

**Town of
BROOKFIELD**

Zone 5

Zone 1

W-220

W-212

W-204

W-196

W-188

1

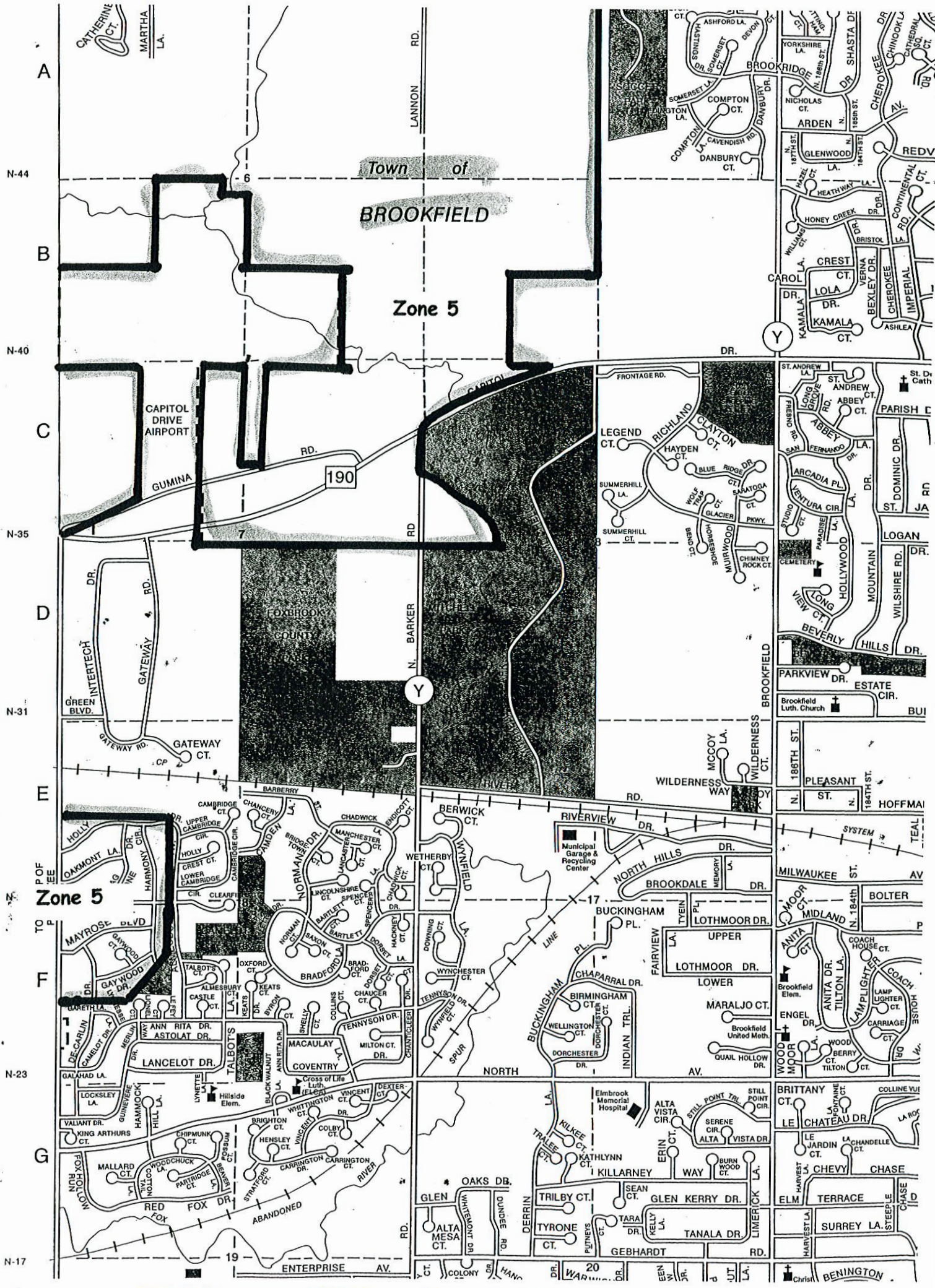
2

3

4

5

59



ATTACHMENT 13

Glossary of Terms

TREE CONDITION

A condition rating helps to assess overall forest health and to evaluate a species performance. Bluestem Forestry Consulting Inc. uses criteria adapted from the International Society of Arboriculture Valuation of Landscape Trees, Shrubs and Other Plants: A Guide to the Methods and Procedures for Appraising Amenity Plants (Seventh Edition) as the basis for the field condition rating.

At least seven factors were examined and rated to determine the condition of a tree. These factors are crown development, trunk, major branch structure, twig growth rate, foliage health, insects/diseases and roots. General descriptions of the criteria used to categorize each condition are as follows:

Excellent - A tree in excellent condition has no visible defects and appears to be in perfect health. The tree will exhibit all of the characteristics typical of its species. An excellent tree can be expected to live well into the future.

Good - A tree in good condition has a sound trunk and a full canopy and has only minor mechanical injuries such as minor trunk scarring that will eventually heal. The tree will exhibit most of the characteristics associated with its species and can be expected to live for many years.

Fair - A tree in fair condition will be exhibiting minor to moderate defects. Some situations that would warrant a fair rating include: a thinning canopy, twigs growth may only be 1/2 the expected rate, significant mechanical injury such as scarring on the trunk, insects or disease may be present but are controllable and the crown may be lacking the natural or desired symmetry characteristic to the species. If given routine maintenance such as pruning and mulching a tree that is graded fair will contribute to the forest for many years.

Poor - A poor tree will be expressing low vigor and significant decline as evidenced by branch dieback, abnormal leaf size, early fall coloration, trunk decay due to injury or canker or the production of new branches on the main stem. A tree in poor condition will most likely require removal, but may be improved with priority pruning.

Very Poor - A tree in very poor condition is on the verge of dying. Dieback will be severe or it may be lacking a full crown. Trunk/crown cavities or decay, severe cracks and seams or severe root problems may also be present. Removal for safety will be required.

Dead - A tree in dead condition is simply a dead standing tree. These will most likely occur in wooded or unmaintained areas, but may also occur with smaller new plantings that have failed. These trees will require removal.

TREE MAINTENANCE NEEDS

Each tree inventoried was assigned a maintenance category. Field judgments were made from the ground based on observation and hazard estimation. Criteria was adapted from two sources: A Photographic Guide to the Evaluation of Hazard Trees in Urban Areas (Second Edition) by Nelda Matheny & James Clark and from a Minnesota Department of Natural Resources Publication How to Detect, Assess and Correct Hazard Trees in Recreational Areas.

The following are the definitions of the maintenance categories:

Immediate Removal - Trees designated as an immediate removal are either dead or have one or more defects that cannot be remedied. These trees will most likely have a severe trunk defect such as a cavity or extensive decay, have severe cracks associated with weak unions or have a large percentage of crown death and are potential safety hazards. Most of the trees in this category will rate a very poor or dead condition rating.

Scheduled Removal - Trees that should be removed, but that pose minimal liability to persons or property will be listed in this category. Examples include new tree planting failures or undesirable species that are beginning to decline and cannot be improved with pruning. The majority of these trees will rate a poor condition.

Immediate Prune - These trees have severe deadwood, hangers or broken branches that need to be remedied as soon as possible. Trees with unattached hanging branches or dead attached branches that are over 2 inches in diameter will be listed in this maintenance category. Overall re-evaluation of the tree while pruning may result in removal of the tree if more extensive problems are noted.

High Priority Prune - These trees need pruning more quickly than a routine pruning cycle will allow and have dead, dying or weakened branches that are over under 2 inches in diameter. The majority of these defects can be corrected with pruning and the tree can be expected to live for many years.

Routine Prune - All trees need to be placed on a cycle of trimming to correct small structural problems or growth patterns that will eventually effect the tree adversely. Routine pruning will result in a healthier, more vigorous tree and will extend the life of most trees. A routine pruning cycle of once every 5-8 years is idea.

Training Prune - Training pruning is the structural pruning of all trees 10 years of age or younger. Removing poorly attached co-dominant, crossing and competing limbs while the tree is young, resulting in small cuts and wounds will produce a well-balanced mature crown. This is the most cost-effective form of all maintenance.

BOULEVARD DESCRIPTIONS

The size and type of boulevard is noted during the inventory. The following are the categories used to classify the boulevards:

4' - This describes a boulevard that is framed by a sidewalk and curb or street and is 4 - 4.5' in width. This is the minimum size requirement for tree planting. Only small, narrow growing species should be planted here.

4-6' - This describes a boulevard that is framed by a sidewalk and street or curb and is at least 4.5' and up to 6' in width. These boulevards are typically ideal for medium sized trees.

6'+ - These boulevards are framed by a sidewalk and street or curb and are over 6' in width. Larger trees are typically planted here.

Unrestricted - These are boulevards that do not have a sidewalk present. These boulevards occur most frequently in "yard" type settings where there is a right-of-way, but there is no sidewalk. They can also occur in wooded or park settings.

Median - A median is used to describe a boulevard that is bordered on two sides by a street. It essentially divides the two directions of traffic and runs down the middle of the street. These most likely occur in business districts. A honeylocust can be found along a median at 10709 Market Street (Sears).

Park - This setting describes a tree growing in a park.

ATTACHMENT 14

Risk Management Guidelines

RISK MANAGEMENT

Risk: is the potential for suffering harm or loss.

Risk Management: is the ability to minimize the potential for harm or loss from occurring by implementing a sound risk reduction strategy.

Types of Risk

- Financial
- Physical harm

A Risk-Reduction Strategy for Trees

- Evaluate the natural resources being managed
- Evaluate the resources available to you (fiscal, staff, equipment, etc.)
- Develop a policy statement
- Develop an action plan
- Periodic review of all four components

EVALUATE THE NATURAL RESOURCES BEING MANAGED

Evaluate the Entire Population

An understanding of the entire population allows you to identify the key problem areas within the population.

- Species distribution
- Diameter distribution
- Condition distribution
- Defects
- Locations and targets

Identify Problematic Species

Identify the species that, based on your knowledge and experience, pose the greatest physical threat.

- High history of failure
- High storm damage potential
- Prone to high-risk structural defects

Identify Problematic Diameters

Identify the diameters that, based on your knowledge and experience, pose the greatest problem in your population.

- Large diameter trees

Identify Problematic Conditions

Identify the conditions that, based on your knowledge and experience, pose the greatest problem in your population.

- Very poor trees
- Poor trees

Identify Problematic Defects

Identify the defects that, based on your knowledge and experience, pose the greatest problem in your population.

- Basal decay and cavities
- Major dieback
- Poor branch attachments

Identify Locations and Targets

Identify the locations and targets that, based on your knowledge and experience, pose the greatest physical threat in your population.

- Busy streets
- Playground areas

EVALUATE THE RESOURCES AVAILABLE TO MANAGE

Staffing

- Number
- Training
- Work load

Equipment

- Diagnostic
- Capabilities/limitations
- Availability

Fiscal

CREATE A TREE RISK MANAGEMENT POLICY STATEMENT

Components of a Policy Statement

- State your agency's understanding of its responsibility to maintain a safe public area.
- Identify the manager of the risk reduction program.
- List any general constraints on managing hazard trees such as financial or personnel.

The following is an example of a Hazard Tree Policy Statement:

The City of Metropolis has an active policy to maintain the safety of public lands from potentially hazardous trees. The City will strive to eliminate, in a timely fashion, any tree deemed hazardous. When available fiscal and human resources limit the ability of the City to remove high-risk trees, priority shall be placed on

trees deemed to carry the highest risk. The standard for rating the potential risk of a tree will be the International Society of Arboriculture's twelve-point hazard evaluation system. The Superintendent of Forestry will administer this program and have final judgment in all matters concerning the mitigation measures taken for any tree deemed hazardous.

Benefits of a Policy Statement

- It defines for staff the overall mission of the company or agency as it relates to high-risk trees.
- Minimizes political influence
- Allows staff to do their job

DEVELOP AND IMPLEMENT AN ACTION PLAN

Goal

After evaluating your resources, define problem areas and broad solutions to those problems. View this as a wish list.

Objectives

Define clear objectives that address the general goals you have established. The details should be more specific. A good objective defines what is going to be done and in what timeline.

Actions

A series of actions should be identified that address each objective defined.

PERIODIC REVIEW OF ALL FOUR COMPONENTS

Review all four components of your risk management plan frequently

ATTACHMENT 15

Wisconsin Department of Natural Resources
Planting Specifications

DEVELOPING TREE PURCHASE AND PLANTING SPECIFICATIONS FOR BID

Draft 11/99

The following is a template for developing specifications for the purchase and planting of landscape grade trees to be used by a local government or nonprofit organization. It is designed with the tree's best interest as its guiding principle. It reflects current research-based standards recommended by the Wisconsin Department of Natural Resource's Urban Forestry Working Group with input from both local governments and the green industry. This template is not a boilerplate where you simply fill in your name. It is designed so that the final specification can be adjusted to fit individual needs and circumstances.

How To Use The Specification Template

Much of the template is recommended for all specifications, however there are a number of situations that require a decision on the part of the purchaser. This may depend on the preference of the purchaser, the planting site, the purchaser's resources or the availability and capability of local bidders.

Where information specific to the purchaser is needed, the template will show a blank line with the needed information shown in parentheses. Where decisions are required, the template offers options to choose from which include an explanation of desired or expected results. Option wording, shown in normal text, should be included in the specification. Wording in *italics* is the option's explanation and should not be included in the final specification.

Remember that this is a recommended, not a required, specification. Every jurisdiction may have its own wording and requirements for specifications. For example, a contract surety bond may be advisable or required. Make sure that your final specification has been reviewed by your attorney to be sure you are complying with local regulations and policies.

Selection of a Bidder

Some of the specified or optional practices in this template may be more stringent than common practices in the industry. This will likely result in a more expensive contract. However, the specifications are designed with the tree's best interest as its guiding principle, not ease or speed of installation. Reputable bidders will carefully read the specification and bid accordingly. Less reputable bidders may simply bid according to their common practice and as a result come in with a lower bid. The resulting job performance may be sub-standard or poor quality. It is important to have a pre-opening meeting to answer any questions that the specification may generate and to weed out any potentially disappointing bidders.

It also would be wise to get to know the nurseries you expect to use. Visit their fields, get to know the owners and managers. Share your needs with them so they will know your expectations. They can tell you the best time to submit your order to get the best selection. The nursery business is unlike other suppliers. Demand cannot be met simply by making more widgets when they are requested. Demand must be anticipated years in advance.

Caution

Specifications are only as good as their enforcement. It is important to have a trained inspector monitoring the job as it progresses. If it is known that there will be no inspection, disreputable bidders will under-bid a job and cut corners to make up the difference. Do not wait to do the inspection until the job is complete. If planted nursery stock is sub-standard, it is often impossible to find replacements until the following year. It may also be very difficult and damaging to the trees to correct improper planting after the fact.

Reference

If you are unfamiliar with planting practices it would be wise to acquire the following reference which will explain much of the science and reasoning behind the specifications. It is available from the International Society of Arboriculture at (217) 355-9411.

Watson, Gary W. and E.B. Himelick. 1997. Principles and Practice of Planting Trees and Shrubs. International Society of Arboriculture, Champaign, IL. 199p.

TREE PURCHASE AND PLANTING SPECIFICATIONS

Pre-qualification of Bidders

All bidders, prior to award of contract must present satisfactory evidence that they have been regularly engaged in this type of work and they are prepared with the necessary labor, materials and equipment to execute work to the satisfaction of the Purchaser. This evidence includes

_____ (Specify required evidence). *Note: This evidence could include a reference list including name, address, phone number and description and dates of completed projects. Other evidence might include a payroll list, equipment inventory, nursery stock inventory or other evidence that indicates these resources are available to the bidder. An inspection of the business premises may be helpful.*

Proposal Form

All proposals shall be made on the attached proposal forms. Bidders must submit prices for the bid in both words and figures. In case of discrepancy, written words shall prevail. Prices shall be given by tree price, planting price, and total price.

Award of Contract or Contracts:

Contract will be awarded to the lowest, responsible, qualified bidder whose proposal complies with the requirements. There may be more than one contract awarded. Contractor should bid on the services that they provide or materials that they have. The Purchaser reserves the right to reject any and all proposals, and to accept the bid or bids most advantageous to them.

Examination of Plans, Specifications and Sites

Bidders may examine all plans, specifications and sites. No deviation from specifications will be allowed without written consent from _____ (Purchaser's Representative) prior to award of contract. Failure to fully examine project sites and work requirements will not relieve bidder from performing work as per plan and specifications.

Insurance and Worker's Compensation

The Contractor shall furnish evidence of Worker's Compensation, public liability and property damage insurance. Limits of insurance shall be as follows: Minimum amounts of \$1,000,000 bodily injury and \$500,000 property damage including both injury and property damage caused by vehicles and machinery. A certificate of insurance shall be filed with

_____ (Purchaser's Representative and address).

Inspection and Payment

The Purchaser shall inspect work periodically to insure that all specifications are adhered to. In no case shall the final payment be made until the Contractor has complied with all requirements set forth and the Purchaser has made final inspection of the entire work and is satisfied that the entire work is properly and satisfactorily complete per plans, specifications, and ready for Purchaser acceptance.

Completion

All work shall be completed by _____ (date) unless otherwise approved as noted in project specifications.

Guarantee

All work and materials shall be guaranteed in writing as specified in section 15.

Questions

All questions regarding these specifications shall be directed to _____ (name), _____ (title) at _____ (phone #).

1. Scope

- A. These specifications, including drawings and plant materials lists, apply to those items necessary for and incidental to the execution and completion of planting as indicated herein.
- B. All labor, supervision, equipment, materials, and supplies necessary for the execution of the work shall be provided for by the Contractor at no additional cost to the Purchaser.
- C. Reasonable care shall be exercised during excavation, planting, filling, grading, and cleanup, to protect from damage all existing trees, shrubs, and other specified vegetation, and other site features, improvements, structures, and utilities.

In planting situations where there are existing trees or other features that need specific protection, the following optional language may be desired. To save money, the tree protection plan and implementation could be done by the purchaser. Information on protecting trees during construction is available from the DNR.

Option 1:

- 1. A site protection plan, approved by the purchaser, must be provided by the Contractor. The plan must include a site map showing equipment traffic routes, material storage areas, and the location of tree and feature protection methods such as fencing, bridging, mulching, etc.

2. Applicable Specifications and Standards

- A. **American Standard for Nursery Stock, ANSI Z60.1.** current edition. American Association of Nurserymen, Inc., 1250 I St. NW, Suite 500, Washington, D.C. 20005
- B. **Index of Garden Plants: The New Royal Horticultural Society Dictionary.** By Mark Griffiths. 1994. Timber Press, Inc. Portland OR.
- C. **American National Standard for Tree Care Operations, ANSI A300** -most current edition. International Society of Arboriculture, PO Box 3129, Champaign IL 61826-3129.

3. Planting Season

- A. Planting shall be done within the following dates:

- 1. deciduous trees and shrubs _____ to _____.
- 2. evergreen trees and other _____ to _____.
- 3. Exceptions: _____

Options: Acceptable planting times depend on plant species, type of stock, climate, and weather. Spring, after the ground thaws and before the tree buds begin to grow, is the best time to plant most species, however late summer through fall is acceptable for many species. With care and proper techniques, planting may also be feasible in summer. The following recommendations are the optimal planting times. Weather and other circumstances may require variance from these dates - see B. below.

Option 1. Southern Wisconsin:

- 1. April 1 to May 30 - OR - October 1 to December 1
- 2. April 1 to May 30 - OR - August 15 to October 1
- 3.

Option 2. Northern Wisconsin:

- 1. April 15 to June 30 - OR - September 1 to November 1
- 2. April 15 to June 30 - OR - August 15 to October 1
- 3.

- B. If special conditions exist that warrant a variance in the above planting dates, a written request shall be submitted by the Contractor to _____ (*Purchaser's representative*) stating the special conditions and the proposed variance. Permission for the variance will be granted at the discretion of the Purchaser.

4. Materials

- A. A complete list of plants, including a schedule of quantities, sizes, and other requirements is included. In the event that discrepancies occur between quantities of plants indicated in the

Plant List, and as indicated on the Drawings, the plant quantities indicated on the Drawings shall govern.

The Contractor shall furnish a written list of the proposed sources of nursery stock. Such a list shall be furnished with completed bid documents. Such list may not be added to or altered without the consent of the Purchaser.

All plant material shall conform to **American Standard for Nursery Stock**. Plants shall be true to species and variety specified and nursery grown in accordance with good horticultural practices under climatic conditions similar to those in the locality of the project for at least 2 years. They shall have been freshly dug (during the most recent favorable harvest season). Plants shall be so trained in development and appearance as to be unquestionably superior in form, compactness, and symmetry. They shall be sound, healthy, vigorous, well branched and densely foliated when in leaf, and free of disease and insect adults eggs, pupae or larvae. They shall have healthy, well-developed root systems and shall be free from physical damage or other conditions that would prevent thriving growth.

Trees with multiple leaders, unless specified, will be rejected. Trees with a damaged, cut, or crooked leader, included bark, abrasion of bark, sunscald, disfiguring knots, insect damage, mold, prematurely opened buds, or cuts of limbs over 3/4 inch (2 cm) diameter that are not completely callused are cause for rejection.

Balled and burlapped plants shall be dug with solid balls of standard size, the balls securely wrapped with non-synthetic, untreated, biodegradable burlap, and tightly bound with non-synthetic, biodegradable rope or twine. Alternatively they may be placed in wire basket lined with non-synthetic, untreated, biodegradable burlap and tightly bound with non-synthetic, biodegradable rope or twine. Bare root plants shall have a healthy, well branched root system characteristic of the species and with adequate spread.

Containerized plants shall be well established in the container with a root system sufficiently developed to retain its shape and hold together when removed from the container. Plants shall not be pot bound, nor have kinked, circling, or bent roots.

Plants shall conform to the measurements specified, except that plants larger than those specified may be used if approved by the Purchaser. Use of larger plants shall not increase the contract price nor allow the Contractor to use smaller than specified material on other plants. If larger plants are approved, the root ball, root spread, or container shall be increased in proportion to the size of the plant.

Caliper measurements shall be taken on the trunk 6 inches (15 cm) above the root collar for trees up to 4 inches (10 cm) in caliper, and 12 inches (30 cm) above the root collar for trees over 4 inches (10 cm) in caliper. Height and spread dimensions specified refer to the main body of the plant and not from branch tip to branch tip. Plants shall be measured when branches are in their normal position. If a range of size is given, no plant shall be less than the minimum size, and no less than 50 percent of the plants shall be as large as the maximum size specified. Plants that meet measurements but do not possess a normal balance between height and spread shall be rejected.

Substitutions of plant materials will not be permitted unless authorized in writing by the Purchaser. If proof is submitted, substantiated in writing, that a plant specified is not obtainable, consideration will be given to the nearest available size or similar variety, with a corresponding adjustment of the contract price.

- B. All plants shall be labeled by size and scientific plant name as listed in the current edition of **Index of Garden Plants**. Labels shall be attached securely to all plants, bundles, and containers of plant materials when delivered. Plant labels shall be durable and legible, with information given in weather-resistant ink or embossed process lettering.
- C. Mulching material shall consist of aged or composted wood chips or shredded bark and shall be free of material injurious to plant growth. Wood chips shall be 1/8 inch nominal thickness with at least 50 percent having an area of not less than 1 square inch and no piece having an area of more than 6 square inches.

- D. Water shall be provided by the _____ (Contractor/Purchaser - select one) and be suitable for irrigation and free from ingredients harmful to plant life.
- E. Trunk wrapping material, if specified, shall be perforated drainage tubing or similar material approved by the Purchaser, large enough in diameter to prevent abrasion of the trunk and to allow air circulation between the tubing and the trunk.
- F. Guying and staking materials, if specified, shall be as follows. Stakes shall be 6' to 8' long sections of unflanged metal or 2" x 2" hardwood. Support ties shall be 2" or wider bands of polypropylene, or elasticized or webbed strapping. Ground anchors shall be arrowhead shaped earth anchors of malleable iron castings, aluminum castings, or stamped steel.
5. **Certification**
- A. All plant materials, shipments, and deliveries shall comply with state and federal laws and regulations governing the inspection, shipping, selling, and handling of plant stock. A certificate of inspection, or a copy thereof, for injurious insects, plant diseases, and other plant pests shall accompany each shipment or delivery of plant material. The certificate shall bear the name and address of the source of the stock.
6. **Selection and Tagging**
- A. Plants shall be subject to inspection for conformity to specification requirements and approval by the Purchaser at their place of growth prior to award of bid. Inspection outside the state of Wisconsin shall be made
Option 1. at the expense of the _____ (Contractor/Purchaser - select one).
Option 2. through photographs submitted by the Contractor.
- B. *Option 1.* Include this paragraph if tagging particular trees for purchase. A written request for the inspection of plant material at their place of growth shall be submitted to the Purchaser at least 5 working days prior to digging. This request shall state the place of growth and the quantity of plants to be inspected. The Purchaser may refuse inspection at this time if a sufficient quantity of plants is not available for inspection.
Option 2. Omit digging notification language if no tagging of trees to purchase is planned.
- C. *Option 1:* All plants shall be selected and tagged by the Purchaser at their place of growth. *This option will add to the cost of the tree because of increased handling and tracking by the nursery, but it assures which plants you are purchasing.*
Option 2: Omit tagging at place of growth language. *Some marginal stock could be delivered as a result and will require more careful inspection at delivery.*
- D. Plants shall be inspected upon delivery, and the Purchaser reserves the right to reject any plants that do not meet the standards or that have been damaged during shipment. Such approval shall not impair the right of inspection and rejection during progress of the work.
- E. A Contractor's representative shall be present at all inspections.
- F. The Purchaser shall be the sole judge of acceptability of stock at any time during the course of this contract.
7. **Digging and Handling Plant Materials**
- A. Plants to be balled-and-burlapped shall be dug with firm, natural balls of earth of diameter not less than that recommended in the current edition of **American Standard for Nursery Stock**, and of sufficient depth to include fibrous and feeding roots. The root collar shall be within the top 2" of the soil ball. Balled and burlapped plants with manufactured balls or balls that are dry, cracked, or broken before or during planting operation will not be accepted.
8. **Transportation and Storage of Plant Material**
- A. Fresh dug material is given preference over plant material held in storage. Plant material held in storage will be rejected if excessive growth or dieback of branches has occurred in storage.
- B. Branches shall be tied with rope or twine only, and in such a manner that no damage will occur to the bark or branches.
- C. During transportation of plant material, the Contractor shall exercise care to prevent injury and drying out of the trees. Should the roots be dried out, large branches broken, balls of earth broken or loosened, or areas of bark torn, _____ (Purchaser's Representative) may reject the injured tree(s) and order them replaced at no additional cost to the Purchaser.

- D. The root systems of each load of bare root stock sent from the storage facility shall be adequately covered with wet soil, sawdust, wood chips, moss, peat, straw, hay or other acceptable moisture-holding medium, and shall be covered with an open-mesh tarpaulin or canvas. Loads that are not protected in the above manner may be rejected. *Note: tight-woven tarps and canvas can cause a load of trees to overheat on a sunny day, resulting in serious damage.*
- E. Plants must be protected at all times from sun or drying winds; Those that cannot be planted immediately on delivery shall be kept in the shade, well protected with soil covered with wood chips or other acceptable material, and kept well watered. Plants shall not remain unplanted any longer than 3 days after delivery without permission from the purchaser. Plants shall not be bound with wire or rope at any time so as to damage the bark or break branches. Plants shall be lifted and handled with suitable support of the soil ball to avoid damaging it.

9. **Delivery**

- A. Bid prices shall include delivery to the Purchaser's receiving site located at _____ (address). All trees shall be delivered to the specified site before _____ (date).
- B. Plant materials shall not be shipped C.O.D., and any shipment so made will be refused by the Purchaser.
- C. The Contractor shall give the Purchaser notice of delivery time 3 to 5 days prior to delivery.

10. **Excavation of Planting Areas**

- A. The Purchaser will _____ (stake/mark with paint - *select one*) all planting areas. The Contractor will notify Digger's Hotline to verify location of underground utilities before excavation begins. The Contractor shall be responsible for assuring that utility marking is complete before excavation begins. The Contractor shall be responsible for all damage resulting from neglect or failure to comply with this requirement.
- B. The Contractor shall excavate planting areas as shown on the drawings. *(The drawings may have to be customized depending on choice of options below).* Excavation may be done by shovel, backhoe or stump grinder, but a soil auger may not be used. *Digging the hole with a stump grinding machine produces the most friable soil and minimizes glazing of the sides of the hole particularly in heavy clay soils. Soil augers glaze the sides of the planting hole, particularly in heavy clay soils, preventing penetration by the roots into the surrounding soil. Augers could be acceptable in sandy soils if any glazing of the sides was broken up and surrounding soil was tilled.*

Options: Research has shown that a wider planting hole improves establishment of a tree, particularly in heavy soils. The best option for the tree is a hole 3 (or more) times the diameter of the soil ball or root ball. Common practice in the industry is 1.5 to 2 times the ball diameter so this option will be more expensive. Loosening the soil with a rotary tiller, beyond the hole, 6-12" down will have nearly the same effect as a wide hole and will be somewhat cheaper. If the planting site is restricted e.g. between the sidewalk and the curb, you will not be able to dig a round hole. In this case you should dig an equivalent rectangular area. See Table 1 on page 10 for conversion examples.

Option 1. The planting hole shall be at least 3 times the diameter of the soil ball and the soil shall be loosened beyond the edge of the planting hole. *This option should be selected in particularly heavy or compacted soils or when the best conditions are desired for the tree.*

Option 2. The planting hole shall be at least 2 times the diameter of the soil ball and the soil shall be loosened at least one ball diameter's distance beyond the hole to a depth of 6" to 12" using a rotary tiller.

Option 3. The planting hole shall be 1.5 to 2 times the diameter of the soil ball. *This option should only be used in light, sandy, uncompacted soils.*

The soil pad on which the soil ball or root ball will be placed shall be of undisturbed soil. The depth of the pad shall correspond to the distance from the bottom of the soil ball to the root collar, or slightly less. Glazed planting hole surfaces shall be sufficiently roughened prior to

backfilling. *Note: The root collar is the area where the roots join the trunk. For most trees in native settings, the root collar is just below the soil surface, though it may be 1-5" lower for oak, hickory and pear. With bare root trees the root collar's location is obvious. With nursery grown B&B trees the root collar is rarely visible often being several inches below the surface of the soil ball. This depth can be determined by checking the depth in the nursery before the trees are harvested; or by using a wire and gently probing the ball to find the major roots; or by estimating, knowing that the roots will likely be about 4" below the swelling at the base of the trunk. This swelling is caused by either a graft union or cutting back of a rooted cutting.*

- C. Excavated planting holes that will be left open when work is not in progress or pose an immediate and considerable hazard to pedestrians or vehicles shall be adequately barricaded with appropriate warning devices.
- D. The Contractor shall notify the Purchaser, in writing, of soil conditions or other obstructions the Contractor considers detrimental to tree growth. Such conditions shall be described, as well as suggestions for correcting them. Proper water drainage must be assured.
- E. Where soil conditions or below ground obstructions which cannot be remedied are encountered, the Purchaser shall designate alternate planting locations. The Purchaser shall bear any costs associated with such relocation.

11. Planting Operations

- A. Plants must be protected from excessive vibrations. Plants shall not be thrown or bounced off a truck or loader to the ground. Plants shall not be dragged, lifted, or pulled by the trunk or foliage parts in a manner that will loosen the roots in the ball.
- B. Plants shall be set with the top of the root collar at or slightly above finished grade. Plants must be centered in the hole and set plumb. Plants shall be set so that they will be at the same depth 1 year after planting. *Note: planting depth is important because research has shown that some species planted too deep will develop trunk diseases or girdling roots or be more susceptible to breakage in wind storms. These problems often don't show up until years after planting.*
- C. Bare root plants shall have their roots spread into a natural position, free of bunching, kinking, or circling. All broken or damaged roots shall be cut back to the point where they are clean and free of rot. No other root pruning shall be done.
- D. For plants in plastic, metal or biodegradable containers, the container shall be removed before planting. If roots are crowded or coiled on the bottom, sides, or surface of the root ball, they shall be gently separated from the edges or surface.
- E. For all plants moved with a tree spade, all holes and cavities between the ball and the surrounding soil shall be filled. Glazed planting hole surfaces shall be sufficiently roughened prior to backfilling. The ball shall be thoroughly soaked with water after planting.
- F. Removal of ropes, strings, wire baskets, burlap, and other wrappings from B&B plants.
Options: The intent here is to prevent girdling of the trunk by the twine and restriction of root growth by the burlap and wire basket. How to do it is controversial. With Option 1, removal of the twine and burlap assures that there will be no restriction, however if improperly done, the soil ball may crack or fall apart which would threaten tree survival. Make sure that the ball is in the hole and well supported with backfill before the twine, etc. is loosened. Option 2 minimizes potential for disrupting the ball, but depends on natural decomposition. It requires additional inspection to make sure that the materials are decomposing. Also, be aware that the burlap must be completely covered with soil. If exposed to the air, it will dry out, potentially wicking moisture from the ball and making it difficult to re-wet. If the root collar is deep in the ball and the ball planted high as a result, soil will have to be mounded above grade to assure the burlap is covered. Option 1 must be selected if there is a wire basket or if synthetic twine or burlap or treated burlap is used. (note that in section 4A. synthetic burlap and twine are not allowed.)
Option 1. After the plant has been set and one half of the backfilling completed to support the ball, ropes, strings, wire baskets, burlap, and other wrappings shall be removed from the top one-half of the ball. The balance of the wrappings may be left intact around the bottom half of the ball. If the root collar is deep in the ball, remove excess soil away from the trunk using hands, not tools.

Option 2. Once the tree is set and backfilled, any rope, string or twine should be removed from around the trunk. The Contractor will ensure that within 60 days, all ropes, strings, burlap, and other wrappings will have decomposed so as not to restrict growth of trunk and roots. If this has not occurred, the contractor must remove the restricting materials within one week of notification by the purchaser.

- G. Planting holes shall be backfilled with excavated soil. When holes are approximately two-thirds full, they shall be thoroughly watered to eliminate air pockets. After this initial watering, excavated soil shall be installed to the top of the hole and watered. Prevent puddled soil conditions by avoiding compaction once the soil is wet. If burlap and wrappings are not removed they must be covered with soil.
- H. Planting areas shall be finish-graded to conform to drawings after full settlement has occurred.
- I. All plants shall be mulched over the root system with a 3-4-inch layer of aged wood chips or bark immediately after planting. Mulching material shall be pulled back no less than 3" and no more than 6" from the trunk.
- J. Plants shall be thoroughly watered immediately after planting.
- K. All twine, rope, transit guards or wrappings, and plant labels secured around the trunk or branches shall be removed after planting is completed.

12. Guying, Staking, Wrapping, and Pruning

- A. Only those plants designated by the Purchaser shall have trunk protection installed or be staked and/or guyed. *Note: Research has shown that typical paper or cloth tree wrap provides no benefit to the tree. However, where deer, voles or other animals may cause damage, protecting the trunks is called for. Staking is not recommended as a routine practice. Exceptions may include particularly windy areas, areas where vandalism is expected or when planting large bare root trees in light soil.*
- B. Only trees so designated shall have approved trunk protection installed. The trunk protection shall be secured at the top and bottom of the trunk in a manner so as not to restrict or damage the bark (see specification 4-E). The Purchaser will be responsible for removing trunk protection after a one year period.
- C. Only trees so designated shall be staked and guyed. Ties made of approved material shall be attached directly to the stakes or may be attached to stakes by wire. In no case shall the wire extend around the tree trunk. Ties should be attached loosely enough to allow a small amount of play in the trunk. For drooping stems, ties shall be placed at the point on the stem at which the top can stand up on its own. Stakes shall be driven outside the root ball. For trees larger than 3" in caliper, use ties attached to 3 guy wires and ground anchors. Ground anchors are to be driven at about a 45-degree angle to the ground and placed at 120-degree intervals around the trunk. Staking and guying shall further conform to the drawings. The _____ (Purchaser/Contractor - select one) will be responsible for removing all stakes and straps after a one year period. These stakes and straps will _____ (become/remain - select one) the property of the _____ (Purchaser/Contractor - select one) and should be figured into the bid.
- D. Double leaders, dead branches and any branches damaged or broken during the planting process shall be the pruned. This shall be the only pruning allowed at planting. Pruning shall conform to ***American National Standard for Tree Care Operations, ANSI A300.***

13. Cleanup

- A. Soil, branches, binding and wrapping material, rejected plants, or other debris resulting from any tree planting shall be promptly cleaned up and removed. The work area shall be kept safe and neat at all times until the cleanup operation is completed. Under no condition shall the accumulation of soil, branches, or other debris be allowed upon a public property in such a manner as to result in a public hazard.

14. Acceptance

- A. The Purchaser shall perform an inspection with the Contractor of all plant material after the original planting to note and correct any discrepancies.

- B. Acceptance of plant material by the Purchaser shall be for general conformity to specified size, character, and quality and shall not relieve the Contractor of responsibility for full conformity to the contract documents, including correct species.
- C. Upon completion and reinspection of all repairs or renewals necessary in the judgment of the Purchaser, the Purchaser shall certify in writing that the work has been accepted. Any plant work so accepted will be paid within 30 days at the contract bid price, unless previously negotiated otherwise.
- D. Work may be accepted in parts when the Purchaser and Contractor deem that practice to be in their mutual interest. Approval must be given in writing by the Purchaser to the Contractor verifying that the work may be completed in parts. Acceptance of work in parts shall not waive any other provision of this contract.

15. Guarantee Period and Replacement

- A. The Contractor shall guarantee all plants to be healthy and in flourishing condition for _____ (one/two - select an option) year(s) from the date of acceptance.
Option 1: The guarantee does not include vandalism, storm damage, animal damage or mechanical damage unrelated to contractor activities. *This language can be included to reduce the cost, however it is not recommended, particularly if the contractor is responsible for the maintenance.*
- B. The Contractor shall remove and replace, without cost, and as soon as weather conditions permit, and within a specified planting period, all plants not in a healthy and flourishing condition as determined by the Purchaser any time during the guarantee period. Replacements shall be subject to all requirements stated in this specification.
- C. *Option:* The guarantee of all replacement plants shall extend for an additional period of _____ (one/two - Select an option) year(s) from the date of their acceptance after replacement. In the event that a replacement plant is not acceptable during or at the end of the said extended guarantee period, the Purchaser may elect subsequent replacement or credit for that item. *Note: This language may be included, but it will likely increase the cost.*
- D. The _____ (Contractor/Purchaser - Select one) shall be responsible for all maintenance of the trees during the guarantee period. *Note: Some contractors may be unwilling to guarantee the trees if they are not responsible for the maintenance.*

16. Final Inspection and Acceptance

At the end of the guarantee period and upon written request of the Contractor, the Purchaser shall inspect all guaranteed work for final acceptance. The request shall be received at least 5 working days before the anticipated date for final inspection. Upon completion and reinspection of all repairs or renewals necessary in the judgment of the Purchaser at that time, the Purchaser shall certify, in writing, that the project has received final acceptance.

17. Payment

A variety of payment schedules are possible. The following is only one possibility. In any schedule, it is wise to hold back some amount until the guarantee period is over.

Payment shall be made to the Contractor as follows:

50% of the contract sum upon receipt and approval of plant materials by the Purchaser.

35% of the contract sum upon completion of planting or the plant materials.

10% of the contract sum after the replanting of replacement material if required.

5% of the contract sum after final acceptance.

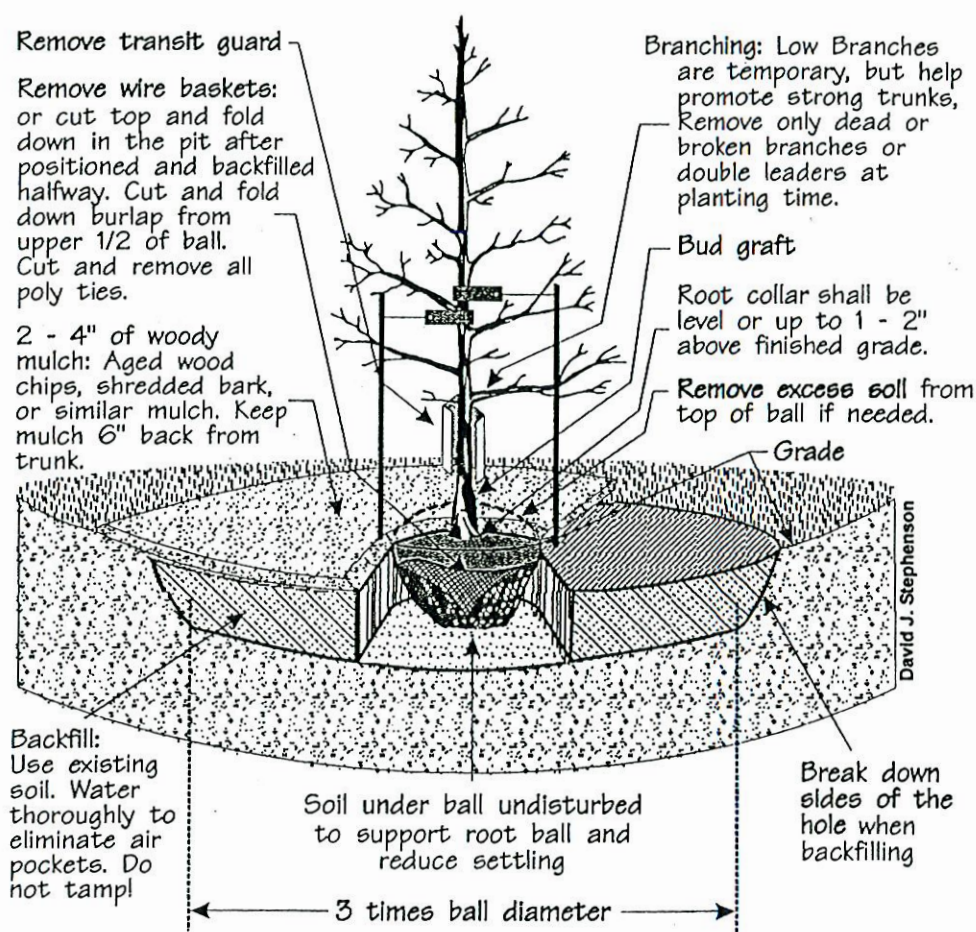
Table 1. Converting a Circular Hole to a Rectangular Planting Space

| Tree Caliper | Ball Diameter | Hole Diameter | Hole Area | 3' wide Terrace | 4' wide Terrace | 5' wide Terrace | 6' wide Terrace |
|--------------|---------------|---------------|--------------------|-----------------|-----------------|-----------------|-----------------|
| 1" | 16" | 48" | 12 ft ² | 3' x 4' | N/A | N/A | N/A |
| 1.5" | 20" | 60" | 20 ft ² | 3' x 7' | 4' x 5' | N/A | N/A |
| 2" | 24" | 72" | 28 ft ² | 3' x 9' | 4' x 7' | 5' x 5.5' | N/A |
| 2.5" | 28" | 84" | 39 ft ² | 3' x 13' | 4' x 10' | 5' x 8' | 6' x 6.5' |
| 3" | 32" | 96" | 50 ft ² | N/R | 4' x 12.5' | 5' x 10' | 6' x 8' |

N/R = Not Recommended

N/A = Not Applicable (circular hole fits in given space)

Proper Tree Planting Diagram



Stake only if you have to. Use 2-3"-wide webbing straps and secure to stakes with heavy gauge wire. The wire should be able to stick straight out from the stake and hold the webbing strap up, preventing it from sliding down the tree. Do not stake tightly - trees gain strength from movement. Remove all stakes after one year.

Use of tree wrap is not recommended, as it causes a number of problems for the tree.