

**TREE INVENTORY AND TREE PROTECTION PLAN
WATERFORD GLEN SUBDIVISION
FITCHBURG, WI**

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Contents:

- I. Introduction & Goals
- II. General Site Assessment
- III. Tree Inventory
- IV. Design Implications
- V. Tree Protection Plan
- VI. Post Construction Maintenance
- VII. Photographs
- VIII. Site Plan

I. INTRODUCTION & GOALS

The objective of the Tree Inventory and Tree Protection Plan is to identify the quality and quantity of the woodland resource in the Waterford Glen Subdivision development site, in addition to planning for its protection during construction and enhancement as a landscape amenity.

II. GENERAL SITE ASSESSMENT

This 20.57 acre site at 5369 Lacy Road, Fitchburg, Wisconsin is currently a single family rural home site. The house is near the middle of the site with established landscape trees along the driveway and in the yard. White pine plantings are grouped along the east fence line and just west of the back yard. A mix of self-seeded deciduous trees grows along the farm field fence line. The Comprehensive Development Plan dated February 15, 2005 provided by Gorman & Company, Inc. indicates that the original house site will be preserved along with some of the surrounding landscape trees. Many of the fence line trees will be in the far rear yard of the proposed lots thus making preservation more probable. Outlot 4 appears to be protecting some of the trees along the north fence line along Lacy Road although the bike path will impact some of the trees.

III. TREE INVENTORY

An inventory was conducted during March 2005. White plastic tags were placed on the trunks of 250 trees of significance with a unique identification number assigned to each tree and written in permanent black marker on the tag. Significance was established by trunk diameter over 5". The attached spreadsheet identifies the species, size, condition, and zone location. Size is identified by class with small having an 8" trunk diameter or less; medium 9-20", large 21-30" and extra large greater than 30". Condition is poor, fair or good, depending upon structure, decay and maintenance. Zones are A-G as identified in the attached zone map.

Due to the large number of trees and uniformity of size and species, zones D, E, F, and G are described only without individual tree identification.

Waterford Glen Subdivision Tree Inventory

Zone	ID Number	Species	Size	Condition
A	1	Black Cherry	Small	Poor
A	2	Black Cherry	Small	Poor
A	3	Elm	Medium	Fair
A	4	Arborvitae	Small	Poor
A	5	Black Walnut	Medium	Fair
A	6	Crabapple	Small	Fair
A	7	Colorado Spruce	Medium	Good

Zone	ID Number	Species	Size	Condition
A	8	Black Walnut	Medium	Good
A	9	Red Pine	Small	Poor
A	10	Elm	Medium	Fair
A	11	Black Walnut	Small	Fair
A	12	Black Walnut	Medium	Fair
A	13	Cherry	Medium	Poor
A	14	Spruce	Medium	Good
A	15	Black Walnut	Medium	Fair
A	16	Colorado Spruce	Medium	Fair
A	18	Cherry	Small	Poor
A	19	Elm	Medium	Fair
A	21	Black Walnut	Small	Fair
A	22	Black Walnut	Small	Fair
A	23	Colorado Spruce	Medium	Fair
A	24	Colorado Spruce	Medium	Fair
A	25	Colorado Spruce	Medium	Fair
A	26	Black Walnut	Medium	Fair
A	27	Mulberry	Medium	Poor
A	28	Hackberry	Medium	Fair
A	29	Red Pine	Small	Fair
A	30	Colorado Spruce	Medium	Fair
A	31	Black Walnut	Medium	Fair
A	32	Black Walnut	Medium	Fair
A	33	Black Walnut	Medium	Fair
A	34	Colorado Spruce	Small	Poor
A	35	Red Pine	Small	Poor
A	36	Cherry	Medium	Poor
A	37	Hackberry	Medium	Fair
A	38	Black Walnut	Small	Poor
A	39	Colorado Spruce	Small	Poor
A	40	Red Pine	Small	Fair
A	41	Red Pine	Small	Poor
A	42	Colorado Spruce	Medium	Fair
A	43	White Pine	Medium	Fair
A	46	Colorado Spruce	Medium	Fair
A	47	Red Pine	Small	Poor
A	48	Black Walnut	Medium	Fair
A	49	Cherry	Medium	Fair
A	50	Cherry	Small	Poor
A	51	Black Walnut	Small	Fair
A	52	Black Walnut	Medium	Fair
A	53-68	Black Walnut	Medium	Fair
A	69	Spruce	Small	Fair
A	70	Spruce	Small	Fair
A	71-82	Black Walnut	Medium	Fair
A	83	Silver Maple	Medium	Fair
A	84-97	Black Walnut	Medium	Fair
B	98	Silver Maple	Medium	Fair
B	99	Honey Locust	Medium	Good

Zone	ID Number	Species	Size	Condition
B	100	Silver Maple	Medium	Good
B	101	Silver Maple	Large	Fair
B	102	Colorado Spruce	Large	Good
B	103	Colorado Spruce	Large	Good
B	104	Honey Locust	Large	Good
B	105	Hawthorne	Medium	Fair
B	106	Honey Locust	Medium	Fair
B	107	Honey Locust	Medium	Fair
B	108	Silver Maple	Large	Fair
B	109	Norway Maple	Medium	Fair
B	110	Silver Maple	Large	Fair
B	111	Norway Maple	Medium	Fair
B	112	Pin Oak	Large	Good
B	113	Red Oak	Small	Good
B	114	Honey Locust	Large	Good
B	115	Silver Maple	Large	Fair
B	116	Crabapple	Medium	Fair
B	117	Pin Oak	Large	Good
B	118	Norway Maple	Medium	Fair
B	119	Honey Locust	Medium	Good
B	120	Paper Birch	Medium	Good
B	121	Honey Locust	Large	Good
B	122	Paper Birch	Medium	Good
B	123	Pin Oak	Medium	Good
B	124	Silver Maple	Large	Fair
B	125	Pin Oak	Large	Good
B	126	Apple	Medium	Fair
B	127	Red Pine	Medium	Fair
B	128	Red Pine	Medium	Fair
B	129	Fruit	Small	Fair
B	130	Fruit	Small	Poor
B	131	Pear	Small	Fair
B	132	Pear	Small	Fair
B	133	Fruit	Small	Fair
B	134	Pin Oak	Medium	Good
B	135	Apple	Small	Fair
B	136	Silver Maple	Large	Fair
B	137	Black Walnut	Small	Fair
B	138	White Pine	Medium	Good
B	139	Cherry	Small	Fair
B	140	Cherry	Small	Fair
B	141	Apple	Small	Fair
B	142	Apple	Medium	Fair
B	143	Cherry	Small	Poor
B	144	Cherry	Small	Poor
B	145	Apple	Small	Fair
B	146	Cherry	Small	Fair
B	147	Cherry	Small	Fair
B	148	Cherry	Medium	Fair

Zone	ID Number	Species	Size	Condition
B	149	Spruce	Medium	Good
B	150	Spruce	Medium	Fair
B	151	White Pine	Small	Fair
B	152	White Pine	Medium	Fair
B	153	Fir	Small	Good
B	154	Fir	Small	Good
B	155	White Pine	Medium	Fair
B	156	Fir	Small	Fair
B	157	White Pine	Medium	Fair
B	158	White Pine	Medium	Fair
B	159	Fir	Small	Fair
B	160	Fir	Small	Fair
B	161	White Pine	Medium	Good
B	162	Spruce	Small	Fair
B	163	Fir	Small	Fair
B	164	Spruce	Small	Fair
C	165	Boxelder	Medium	Poor
C	166	Boxelder	Small	Poor
C	167	Boxelder	Medium	Poor
C	168	Boxelder	Medium	Fair
C	169	Apple	Medium	Fair
C	170	Hackberry	Medium	Fair
C	171	Cherry	Large	Fair
C	172	Hackberry	Small	Good
C	173	Boxelder	Medium	Fair
C	174	Boxelder	Medium	Fair
C	175-249	White Pine	Medium	Fair
C	250	Silver Maple	Large	Fair

Zone D

Fence line row of densely spaced boxelder in the 6-12” trunk diameter size category with occasional cherry and hackberry mixed in. There are no singular remarkable specimen trees.

Zone E

Southern fence line of property continues with a dense but narrow collection of primarily self-seeded boxelders in the 6-12” category with an occasional elm, hackberry and some self-seeded red oaks in an occasional cluster in the 6” trunk diameter category. There are occasional cherry, but no singular specimen trees.

Zone F

East fence line at the southerly end has a continuation of the boxelder with occasional cherries. That group of deciduous trees continues for approximately 400 feet in a narrow strip. Starting approximately 110 feet from the southeast corner, there is a planted double row of primarily white pines that are in a trunk diameter range of 8-14”. There is an occasional arborvitae blended in and occasional red pines. That planting of fence row

white pines continues all the way to the northeast corner. There are occasional larger silver maples interspersed along with volunteer oaks, cherries, hackberries and walnuts.

Zone G

North property line along the Lacy Road right of way. Unplanted mix of black walnuts, some red oaks, hackberry, cherry in the 4-12" category with occasional mulberry. Interspersed are some smaller red and white pines that are in the small size category. It is a densely grown area, in a narrow strip along the fence line.

IV. DESIGN IMPLICATIONS

Those established groups of trees that can be saved will provide significant environmental and aesthetic benefits to the development. The closed upper canopy will provide rainwater interception reducing the potential for erosion and increasing soil moisture retention. The solar orientation and height will provide shading, cooling and glare reduction. Urban wildlife habitat is also provided.

The aesthetic contributions to the landscape include visual and acoustic screening; vertical shape and color relief, naturalizing to the urban setting. The effort to protect, these trees is well justified by the benefits to the development.

V. TREE PROTECTION PLAN

The Tree Preservation Plan (TPP) provides the strategy for conducting the construction project in a way that allows those trees designated for preservation to continue healthy growth for years after the project's completion. A successful TPP requires accurate information on the biology of tree growth, the details of design and construction methods plus knowledge of how trees respond to changed environments. Success is dependent upon a team approach to the problem with a total commitment by the project owner, architect, regulatory authorities, construction crew and consulting arborist.

The following guiding principles adapted from the International Society of Arboriculture publication Trees and Development, A Technical Guide To Preservation of Trees During Land Development by Methany and Clark (1998) summarize the required approach to a successful tree protection effort:

1. Preservation requires the serious commitment of all parties including developer, general contractor, subcontractors, utility providers, city regulators, owners and consultants.
2. Preservation requires an accurate understanding of tree growth and development. For example, it is important to know that the majority of roots are in the first one foot of soil and that oak wilt can enter a tree through untimely pruning wounds.
3. Preservation must begin at the earliest stages of planning.
4. Not all trees can or should be saved. Those with defects or unsolvable siting conflicts should be considered for removal.

5. Preservation focuses on avoiding injury to trees. Once a tree has been damaged even the most competent arborist is limited in finding solutions.
6. Construction impacts are accumulative. Trees have some degree of tolerance for injury but will die as readily from a dozen small injuries as one large one.
7. Good communication between the designated tree consultant, designers, builders and owners is essential.
8. Accurate site information is critical to make useful decisions. One must know not just tree and building location but also grade change, utility trenching, construction equipment access lanes, etc.
9. Tree protection requires adequate space for the trees to survive.

The TPP strategy addresses four distinct stages of the development process as follows:

1. Planning - Design is influenced by tree facts such as location, species and condition. Data is gathered in the field and compiled in a tree resource inventory. Impact evaluation is conducted using the available data.
2. Pre-construction preparation - Includes clearance pruning and tree health enhancement, removal of select trees as needed, determination of a tree protection zone and placement of fencing or soil protectors.
3. Construction – Assignment of tree protection responsibilities to the project superintendent and a strong on site presence of the consulting arborist or a designated responsible person and good relationships with the construction crews is essential to assure that the contractor is enforcing the TPP. Accidents and unforeseen circumstances must be addressed quickly. Documentation is accomplished through a journal and photographs.
4. Post-construction maintenance – Even in the best-case scenario most trees will have been impacted either directly by injury or indirectly through changed environment. The owners will minimally need to guard against opportunistic pests and provide a higher level of water and nutrient monitoring during the trees’ adjustment period.

Following are tree protection and pruning guidelines provided by the City of Fitchburg:

1. *A tree inventory must be completed to determine the genus/species, size and location and to assess the health and value of all trees on the site. A site inspection must be conducted prior to building starts to assess the health of preserved trees and to determine if wind throw hazards exist. A management plan must be developed and executed to ameliorate any hazard or tree risk.*
2. *A protected root zone (PRZ) must be established for all trees designated for preservation to protect roots beyond the apparent drip line or the critical root radius. The PRZ will be determined using the following calculation: a minimum distance of 18 times the tree trunk diameter measured at 4.5 feet above the ground.*
3. *A fence must be erected and maintained outside the PRZ. Visible “Off Limits” signs must be posted at 50-foot intervals along the fence. The following is prohibited within the PRZ:*
 - a. *Grading and excavation except as shown*

- b. *Storage or parking of machinery, equipment or vehicles*
 - c. *Storage, stockpiling, or dumping of construction materials, waste, refuse and excavated soils*
 - d. *Runoff or spillage of noxious materials*
 - e. *Ponding, erosion, or excessive wetting caused by dewatering operations*
 - f. *Attachment of any object to tree branches or trunks.*
4. *Soils must not be stripped from or disturbed within the PRZs of those trees designated for preservation (except for the removal of competing trees or other plants) to prevent the removal of nutrients or beneficial microbes.*
 5. *Grade changes around trees designated for preservation must be carefully monitored and avoided. If grade transitions are necessary near any tree designated for preservation the following arboricultural accepted actions must be taken:*
 - a. *A retaining wall must be built to reduce the horizontal distance for the grade rather than creating a slope from the natural to the finish grade.*
 - b. *Soil aeration systems, consisting of tree well encircling the tree trunk to prevent fill from coming in contact with the base of the tree, load-bearing geotextile fabric covering the original surface, a horizontal grid system of perforated pipes connected together and vented to the tree well and the final fill surface, a layer of gravel fill surrounding the pipes and finally a second layer of geotextile fabric between the gravel and soil fill to prevent the layers from mixing.*
 6. *All trees designated for preservation must be thoroughly watered throughout the PRZs prior to pruning and prior to the removal of nearby trees to reduce the risk of stress and to enhance the recovery periods. Watering must continue throughout the growing season, even after construction is completed, at a rate of 1 inch of water per week.*
 7. *The PRZs must be covered with 3" - 4" of shredded mulch or 4" - 6" of wood chips to retain moisture and reduce soil compaction. The mulch should be retained to cover the PRZs at a depth of 3" - 4" around all preserved trees when construction is completed. Any PRZ that suffers soil compaction due to construction or the operation of heavy equipment must be restructured with a deep-water aeration system.*
 8. *In addition, PRZs for future tree planting should be protected and surrounding soil preserved by applying a layer of wood chips at least six inches thick over areas that will be used for traffic or materials storage during construction. If these areas become part of the new landscape, the wood chips will prevent the soil from becoming too compacted.*
 9. *All trees designated for preservation must be properly pruned of dead, diseased, or hazardous branches and selected live branches prior to the removal of nearby trees to reduce the risk of accidental injury during tree removal and construction. Wounds on live wood of all oaks must be dressed with an arboricultural wound dressing to prevent the spread of oak wilt. Only apply wound dressing to oaks and elms; do not dress the wounds of other species. **Do not prune live wood on any oaks between April 15th and October 1st.***

10. *All trees tagged for removal that are within the PRZ of a tree designated for preservation must be removed with a chainsaw and stump grinder rather than being bulldozed to avoid damaging the roots, trunks and limbs of the tree(s) designated for preservation.*
11. *Any roots that must be severed within the PRZs must be cut with sharp, clean root cutting equipment. The roots must be cut cleanly avoiding any ripping or tearing – do not tear, break, or chop roots. Cover exposed roots within one hour with soil, mulch, or a damp burlap.*
12. *Avoid trenching where underground utilities are required within the PRZ. Tunnel under or around roots by drilling, auger boring, pipe jacking, or digging by hand.*
13. *All paved areas and foundations must be located outside of the PRZs of trees designated for preservation. In the case of exceptions, any tree designated for preservation that's PRZ is encroached by pavement or a foundation must be protected by a root barrier to prevent damage to the pavement or foundation and to protect the health of the tree.*

TREE PROTECTION ZONE FENCING

Fencing defining the tree protection zones should be in place prior to any lot clearing, grade changes, road work or utility excavation. A sturdy, rigid, 4-foot tall plastic snow fence should be installed around the trees to be protected to maintain rigidity and avoid sagging, steel fence posts are to be placed at 6' intervals. Appropriate warning signage will be placed in visible locations. This fencing will be maintained during the entire construction and landscaping phase by the responsible contractor. The exact location of the fencing will be specified in the construction contract documents as drawn on the attached site plan. A gate will limit control access to the protection zone. The project superintendent or other designated responsible person should control access.

UTILITIES

No utility trenching should occur in the tree protection zones. If necessary to cross these zones, tunneling will be required below the root zone. It is required that the contractor advise the consulting arborist or responsible party when utility work will be done near the tree protection zones.

OAK WILT PROTOCOL

Oak wilt is a fungus that can enter the vascular system of oaks causing that system to close with resultant wilting of leaves. Oaks from both the red and white oak groups can become infected with mortality inevitable in the red oak group. Infection can occur in two ways: 1) overland infection when a wound is made during the vulnerable time of approximately April 15 to October 1 allowing the fungus to enter the tree; or 2) through a root graft between a healthy tree and a nearby infected tree.

No oaks will be pruned or wounded from April 15 to October 1. If a wound is accidentally made, an asphalt base tree wound dressing will be immediately applied.

Two cans of this material will be kept on site during construction. If additional clearance pruning is needed, then pruning can be done during the prohibited oak wilt season only with prior consultation with the consulting arborist and under his monitoring. The fungicide Alamo is now available to protect high value oaks from infection if there is nearby disease pressure or to treat recently infected white or bur oaks therapeutically. All wounds or injuries to the trees will be reported to the consulting arborist and documented. Detailed information on oak wilt is available from the University of Wisconsin Extension Bulletin No. G3590 titled, "Oak Wilt Management – What Are the Options?" (1993)

VERIFICATION AND DOCUMENTATION

Either a consulting arborist or a designated responsible person from the construction staff will provide verification that the terms of the tree protection plan are met. Documentation will be generated by a written journal and photographs of the tree protection plan enforcement during the complete construction process.

VI. POST CONSTRUCTION MAINTENANCE

Even with the best planning and the greatest care during construction, land development does have some impact on remaining trees. The habitat changes with different heat loads, changed water movement and drainage and some root loss. The higher value trees will need careful follow-up monitoring. My general recommendations for post-construction action are as follows:

- The trees will require continued monitoring by the owners for at least two full growing seasons after completion of the project.
- Drought stress is to be avoided. One inch of moisture per week is normal.
- Be prepared to treat for significant foliar insects such as gypsy moth or canker worm.
- If crown dieback occurs in the first or second growing season, consider the growth regulator Cambistat 2SC.
- Avoid any further root disturbance, pruning or wounding.
- Do not apply fertilizers at a rate above 1 pound nitrogen per 1000 square feet for two growing seasons and only if the trees are exhibiting some nutrient deficiency symptoms.
- During winter months choose road salts that specifically say non-phytotoxic on the label for use in those areas near the valuable trees. Avoid piling up plowed snow under the root zone of the oaks.

VII. PHOTOGRAPHS



Zone A



Zone B



Zone C



Northeast corner between zones F & G



Zone G



Zone G