



Office of the Clerk/Treasurer

W240N3065 Pewaukee Road
Pewaukee, WI 53072
(262) 691-0770 Fax 691-1798

**COMMON COUNCIL
MEETING NOTICE AND AGENDA
Monday, January 16, 2023
6:30 PM**

Common Council Chambers ~ Pewaukee City Hall
W240 N3065 Pewaukee Road ~ Pewaukee, Wisconsin

-
1. Call to Order and Pledge of Allegiance
 2. Public Comment - Please limit your comments to two (2) minutes, if further time for discussion is needed please contact your District Alderperson prior to the meeting.
 3. Presentation, Discussion and Possible Action Regarding the 2022 City Wide Tree Inventory and Report [Wagner]
 4. Discussion and Possible Action Regarding a Request by Interstate Partners to Remove Weight Limit Restrictions Along Green Road Between Redford Boulevard (Highway F) and Duplainville Road [Wagner]
 5. Discussion and Possible Action Regarding the Revocable Agreement Authorizing Occupancy of Right of Way for Swan View Farms Development [Wagner]
 6. Discussion and Possible Action to Install Snow Fencing on City Land (PWC 0934-021) Along Oak Street to Restrict Access to Pewaukee Lake for Erosion Concerns [Wagner]
 7. Public Comment - Please limit your comments to two (2) minutes, if further time for discussion is needed please contact your district Alderperson prior to the meeting.
 8. Closed Session – You are hereby notified that the Common Council and staff of the City of Pewaukee will convene into closed session after all regular scheduled business has been concluded and upon motion duly made and seconded and acted upon by roll-call vote as required under §19.85(1)(a), Stats. The purpose of the closed session is for the following:
 - §19.85(1)(e): Deliberating or negotiating the purchasing of public properties, the investing of public funds or conducting other specified public business, where competitive or bargaining reasons require a closed session. In this instance the Closed Session is specifically related to the contract with the Village of Pewaukee to provide fire and rescue services.

You are further notified that at the conclusion of the Closed Session, the Common Council may convene into open session pursuant to 19.85(2), Stats., for possible additional discussion and action concerning any matters discussed in closed session and for adjournment.

9. Adjournment

Kelly Tarczewski

Clerk/Treasurer

January 13, 2023

NOTICE

It is possible that members of other governmental bodies of the municipality may be in attendance to gather information that may form a quorum. At the above stated meeting, no action will be taken by any governmental body other than the governmental body specifically referred to above in this notice.

Any person who has a qualifying disability under the Americans with Disabilities Act that requires the meeting or materials at the meeting to be in an accessible format must contact the Clerk/Treasurer, Kelly Tarczewski, at (262) 691-0770 three business days prior to the meeting so that arrangements may be made to accommodate your request.

**CITY OF PEWAUKEE
COMMON COUNCIL AGENDA ITEM 3.**

DATE: January 16, 2023

DEPARTMENT: Public Works

PROVIDED BY: Magdelene Wagner

SUBJECT:

Presentation, Discussion and Possible Action Regarding the 2022 City Wide Tree Inventory and Report [Wagner]

BACKGROUND:

Nathan Schuettepelz from Wachtel Tree Science will present the final report for the 2022 City Wide Tree Inventory. Please find the attached report for your review ahead of the presentation.

FINANCIAL IMPACT:

RECOMMENDED MOTION:

ATTACHMENTS:

Description
2022 Tree Inventory Report

PUBLIC TREE INVENTORY REPORT AND MANAGEMENT PLAN

FOR THE CITY OF PEWAUKEE, WI



PREPARED BY:
WACHTEL TREE SCIENCE, INC.
October 2022

Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022
Page 2 of 78

TABLE OF CONTENTS

TABLE OF CONTENTS	Page 2
ACKNOWLEDGEMENTS	Page 5
EXECUTIVE SUMMARY	Page 6
<u>INVENTORY REPORT</u>	Page 10
I. INTRODUCTION	Page 10
II. INVENTORY METHODOLOGY	Page 11
A. Inventory System	Page 11
B. Public Tree Site Information	Page 11
III. INVENTORY RESULTS AND DISCUSSION	Page 12
A. Street Tree Inventory	Page 12
i. Planting Site Summary	Page 12
ii. Species Frequency	Page 14
iii. Street Tree Planting	Page 17
B. Park/Municipal Tree Inventory	Page 18
i. Species Frequency	Page 18
C. Public Tree Size, Condition and Value Discussion	Page 19
i. Size Class Distribution	Page 19
ii. Condition Rating	Page 20
iii. Maintenance	Page 21
iv. Public Tree Value	Page 23
IV. REVIEW AND CONCLUSION	Page 23
<u>URBAN FOREST MANAGEMENT PLAN</u>	Page 24
I. INTRODUCTION	Page 24
II. STATEMENT OF PURPOSE AND SCOPE	Page 25
A. Purpose	Page 25
B. Scope	Page 25
III. MISSION STATEMENT	Page 25

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

IV.	GOALS AND STRATEGIES	Page 25
	A. Goal 1	Page 25
	B. Goal 2	Page 26
	C. Goal 3	Page 26
V.	CURRENT SITUATION	Page 27
	A. Ordinances	Page 27
	B. Tree Administration	Page 28
	C. Inventory Summary – All Public Trees	Page 30
VI.	REVIEW OF RESOURCES AND DISCUSSION	Page 31
	A. Introduction	Page 31
	B. Estimated Costs	Page 31
	C. Summary	Page 33
	D. Implementation Details (All Non-Ash Trees)	Page 33
	i. Tree and Stump Removal	Page 33
	ii. Safety and Clearance Pruning	Page 33
	iii. Training Pruning	Page 34
	iv. Routine Pruning	Page 34
	v. Tree Planting	Page 35
	vi. Tree Stake Removal	Page 35
	vii. Young Tree Watering	Page 36
	viii. Mulching	Page 36
	ix. Watch	Page 36
	x. Girdling Roots	Page 37
	E. Disease and Insect Problems	Page 37
	i. Dutch Elm Disease	Page 37
	ii. Oak Wilt	Page 38
	iii. Spongy Moth	Page 38
	iv. Emerald Ash Borer	Page 38
	v. Asian Long Horned Beetle	Page 39
	vi. Other Pest Problems	Page 40
	F. Crew Training	Page 40
VII.	KEY NEEDS OF THE URBAN FOREST	Page 41
VIII.	REVIEW OF PLAN	Page 41
IX.	CONCLUSION	Page 42

LIST OF TABLES

Table 1	Top Ten Street Tree Species	Page 14
Table 2	Top Ten Park/Municipal Tree Species	Page 18
Table 3	Maintenance Needs	Page 22
Table 4	Estimated Costs for a Fiver Year Implementation Schedule Public Trees	
	In House	Page 32
Table 5	Sample Specimen Tree List	Page E
Table 6	Size and Tolerance of Tree Species to Construction	
	Impacts	Page E
Table 7	Guidelines for Tree Protection Zones	Page E
Table 8	Trench Augering Distances	Page E

LIST OF FIGURES

Figure 1	Size Distribution	Page 19
Figure 2	Condition Rating Distribution	Page 21
Figure 3	Extent of Tree Protection Zone	Page E
Figure 4	Proper Pruning Techniques	Page E
Figure 5	How Boring Saves Trees	Page E
Figure 6	Tree Planting Detail	Page F

LIST OF APPENDICES

Appendix A:	Inventory Criteria	Page A
Appendix B:	Tree Species Recommendations	Page B
Appendix C:	Definitions	Page C
Appendix D:	References and Resources	Page D
Appendix E:	Standards and Guidelines	Page E
Appendix F:	Planting Specifications	Page F

ACKNOWLEDGMENTS

Wachtel Tree Science would like to acknowledge the cooperation and efforts of the City of Pewaukee officials and their staff who have made this project possible. City officials provided Wachtel Tree Science with necessary information and assistance in a timely and professional manner.

City of Pewaukee

Mayor

Steve Bierce

City Alderpersons

Rich Reinbold
Phil Vetterkind
Ian Clark
Colleen Brown
Jerry Wamser
Brian Dziwulski

City Administrator

Scott Klein

City Staff

Magdelene Wagner	Director of Public Works
Nick Phalin	Parks & Recreation Director
Matt Stevens	Street Superintendent

Wachtel Tree Science Staff

Nathan Schuettpelz	Consulting Department Manager
Brooke Stemple	ISA Certified Arborist RM-8302A
Rachel Nelson	ISA Certified Arborist WI-1422A

This project was funded with a grant from the Wisconsin Department of Natural Resources as authorized under Wis. Stat. 23.097 and with matching funds from the City of Pewaukee

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

EXECUTIVE SUMMARY

The City of Pewaukee recognizes a properly maintained urban forest provides numerous benefits and an increased quality of life to its citizens. These benefits range from air pollution reduction, energy conservation, increased property values, aesthetics and more. The City contracted with Wachtel Tree Science to do a tree inventory analysis and develop an urban forest management plan designed to increase these benefits for the community.

This document reports the findings of the street and parks tree inventory update that was conducted during the spring of 2022 by Wachtel staff. The results include:

ALL PUBLIC TREES

- 3,825 records were collected, consisting of 3,465 tree records, 300 vacant planting sites, and 60 stumps.
- Excluding stumps/vacant sites, this population contains 41 genera and 78 different species of trees. Within the arboricultural industry, a general tree diversity recommendation is the “10-20-30 rule”. This recommends that community forestry managers strive to have no more than 10% of their forest as one species, no more than 20% as one genus, and no more than 30% as one family. The WI DNR supports a more restrictive recommendation of “5-10-20” to avoid the catastrophic losses that have been inflicted from Dutch Elm Disease and the Emerald Ash Borer historically. In practical application, we acknowledge there are hurdles every community must face such as restricted planting budgets and limited nursery stock. In the end, these are recommendations, and each community should do their best to promote the greatest tree species diversity possible.
- Pewaukee’s urban forest is close to meeting the more restrictive guidelines for species diversity but should strive to achieve greater diversity. The maple genus (*Acer*, 697 trees, 20.12%) exposes the City’s urban forest to the greatest risk in the event a pest is introduced that impacts maples. The spruce genus (*Picea*, 548, 15.82%) also exceeds the recommended 10% genus diversity. It is expected that the *Fraxinus* genus (263 trees, 7.6%) will be reduced as ash trees are removed due to Emerald Ash Borer. Species that exceed 5% of the total population are Crabapple (*Malus spp.*), Colorado Spruce (*Picea pungens*), Green Ash (*Fraxinus pennsylvanica*), and Norway Maple (*Acer platanoides*). Some species and genera that should be stopped or limited in their planting are crabapple, maple and spruce trees. Any ash tree species should not be planted due to the presence of the emerald ash borer.
- The City of Pewaukee’s public tree inventory shows a bell-shaped curve size distribution of trees that is heavily weighted in mid-sized trees. Most trees (57.78%) are in the established tree diameter classes of 6-18 inches in trunk diameter. These trees are

Public Tree Inventory Report & Management Plan

For the City of Pewaukee, WI

By Wachtel Tree Science (262)538-1900

October 2022

considered established in the landscape and will grow exponentially, adding value to the landscape. The size class distribution tapers off in the larger size classes, as these larger/older trees decline and are removed. The population of newly planted trees from 1”-6” trunk diameter (812, 23.43%) should be increased. More trees should be planted to replace trees that are naturally lost to old age, or prematurely removed due to invasive, damaging pests (the relationship between ash trees and emerald ash borer).

- A minority of the trees (12.5%) are in good condition classes of 75% or greater, which is not ideal. (77.52%) of all trees are within the fair condition classes of 60 to 70%. The City does not currently manage trees beyond safety clearance and removals. More resources will need to be allocated to manage trees in fair condition. These trees would benefit from routine pruning to improve their health and structure and increase overall value.
- Co-dominant branching was noted in approximately 57.95% (2,008) of all trees. This is a concern to the City’s urban forest, and again a reflection of the City’s current management objective to only provide clearance pruning and removals. Many trees have been planted and have only been managed to raise limbs over streets and sidewalks. The result is that a large number of publicly owned trees have poor structure that could have been corrected when the trees were young. Structural pruning should be utilized to improve young tree structure which can reduce future maintenance costs and improve overall tree health. Trees that are 12 inches trunk diameter and larger are beyond the point of corrective pruning. These trees are more susceptible to failure in storm events and have a greater risk of being prematurely removed. Future maintenance should focus on structural pruning in the years following new tree planting. The City should consider implementing training pruning in following years, and sending employees to forestry training events. A great manual available for field instruction on pruning practices is “The International Society of Arboriculture Best Management Practices, Pruning. *Third Edition.*”
- With a tree population facing immediate needs (structural pruning, planting more trees), the City should plan to allocate greater forestry budgets. The City could look to increase staff hours dedicated to forestry or contract budget to stay on top of these tree care needs to avoid costly large tree failures in the future, and establish a healthy, diverse tree population for years to come.

STREET TREES

- 3,054 street records were collected made up of 2,746 trees, 300 vacant planting sites, and 8 stumps.
- The stocking level is 89.9%, 2,746 of the 3,054 street records are trees (stumps not included).

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

- 115 Ash trees are still in the street tree population. Given current levels of emerald ash borer infestation within the City, these trees will need to come down as soon as possible.
- This population includes 77 different species of trees. 4 tree species, Norway maple (*Acer platanoides*), Crabapple (*Malus spp.*), Littleleaf linden (*Tilia cordata*), and Colorado Spruce (*Picea pungens*) exceed the general recommendation of no more than 5% of any individual tree species should make up an urban forest population. 2 tree species, Freeman maple (*Acer x freemanii*) and White spruce (*Picea glauca*) come very close to meeting the 5% threshold.

PARK TREES

- 771 park and municipal property records were collected consisting of 719 trees and 52 stumps.
- 148 Ash trees are still in the parks. The City is currently administering an Ash tree preservation program through proactive trunk injected treatments in of select trees Balmer, Nettesheim, and South Park(s). Many untreated trees are dead and failing in Balmer Park. Immediate management action should be taken to remove these trees.
- This population includes 41 different species of trees. 3 tree species, Green Ash (*Fraxinus pennsylvanica*), Colorado spruce (*Picea pungens*), and Northern White Cedar (*Thuja occidentalis*), exceed the general recommendation of no more than 5% of any individual tree species should make up an urban forest population. 4 tree species, Austrain pine (*Pinus nigra*), Freeman maple (*Acer x freemanii*), Black walnut (*Juglans nigra*), and Norway spruce (*Picea abies*) come very close to meeting the 5% threshold.

GENERAL OBSERVATIONS

- The City has good species diversity, with some opportunity for improvements being available. In future planting, the City should prohibit the planting of the genus *Acer* (maples), *Picea* (spruce), and *Fraxinus* (ash). The City should limit planting Crabapple and Littleleaf lindens.
- The poor structural condition of ~58% of City streets reflects the lack of regular maintenance that promotes better structure. These trees are more susceptible to failure in severe storm events, requiring additional clean up and adding further stress to limited staff time. Trees should not be planted with a mind set of “set it, and forget it”. Young trees require regular maintenance every 2-3 years following planting to promote good structure. Investing budgets in simple forestry tasks early on will reduce unforeseen budgets down the road to complete technical storm response work.

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

- The City should be commended on taking proactive action through the 2022 WIDNR urban forestry grant to get on track with effective forestry management.

Policy recommendations, maintenance schedules and budget requirements are outlined in the included management plan to assist the City of Pewaukee in both short and long term municipal tree maintenance planning.

INVENTORY REPORT

I. INTRODUCTION

Trees give some of the first impressions of the City of Pewaukee to visitors and provide intangible benefits to the everyday lives of its citizens. Trees add beauty to the City of Pewaukee by softening and complementing of building architecture and creating a pleasant environment. Trees improve the quality of life now and will continue to do so in the future, provided they are managed to their fullest potential.

The energy savings trees produce are well documented. Trees planted around a home can reduce cooling costs by up to 30%, up to \$250 in savings per home per year. Windbreaks aid in reducing winter heating bills. Proper tree placement can reduce solar radiation (creating shaded areas), focus air movement, and lessen air temperature (offsetting the urban "heat island" effect).

Trees improve the quality of the air around us. One acre of full-grown medium-sized trees removes up to 2.6 tons of carbon dioxide each year and produces enough oxygen for 18 people for a year. Trees trap dust particles and absorb a large variety of harmful gases. The proper placement of trees can reduce noise and pollution to more tolerable levels.

Trees play an important role in stormwater management reducing soil erosion, runoff and providing storm water treatment. Trees intercept falling raindrops, resulting in less runoff, while green spaces encourage infiltration, lowering runoff volumes. Trees, taking up water through their roots, take up nutrients that can harm water quality.

Trees benefit the health and well being of people in a variety of ways. Trees reduce air pollutants and urban heating effects, reducing health concerns associated with these environmental conditions. Neighborhoods with more trees are shown to have less crime. Interestingly, certain areas have noted increased crime in the years following ash tree loss due to the emerald ash borer. Forested areas provide a calming environment that benefits our mental health. Individuals that have immersed themselves in forested environments have noted improvements in conditions such as stress, depression, and anxiety. These are just a few of the ways in which trees benefit the lives of people.

The trees in our communities improve recreation opportunities by providing comfortable, inviting parks for a variety of activities. They create wildlife diversity in the City of Pewaukee by providing habitat for birds and small animals that otherwise would not be present.

The urban forest increases economic stability by helping to attract and keep businesses. The Arbor Day Foundation has reported that people will linger longer in shaded shopping areas. Properties rent faster and have fewer turnovers in areas that are well stocked with trees. Studies by the United State Department of Agriculture – Forest Service, show that trees can add 10% or more to property values. It is a fact that people will pay more for a property with trees.

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

The City of Pewaukee’s urban forest can add great value to the community, but it can also be a liability or hazard if not taken care of. Trees that are not managed can fall apart in storms, damaging property and interrupting electric and telephone service. These same trees can pose a risk to people. The City of Pewaukee needs to plan so the best suited trees are planted. No management is an option that always costs more in the long run.

The public trees in the City of Pewaukee are owned by every citizen. Most other public investments a community makes depreciate in value. By investing wisely in trees, values increase for both present and future generations.

II. INVENTORY METHODOLOGY

A. Inventory System

A street and park/municipal property tree inventory was conducted along City streets and within City properties in the spring of 2022. This inventory meets the minimum tree inventory requirements as set by the WIDNR for urban forestry grant recipients.

Field data was collected on tablet computers using ESRI Field Maps, a web-based GIS (geographic information systems) tree inventory collector application. All trees and potential planting sites in the public ROW of the City were inventoried per community mapping supplied by the City.

B. Public Tree Record Information

- Object Identification - tree or vacant growth space unique identification number
- Inspection Date - date the site record was collected or updated
- Species or Site Status - tree species, vacant plantable or stump
- Address - the house number
- Street Name - the street that corresponds to the address
- Location - the general site type or characteristic (street, park, natural area, etc.)
- Growth Space Type - a more detailed description of the growth space, usually the distance between impermeable surfaces
- Diameter at Breast Height (DBH) - tree diameter measured at 4.5 feet above ground, rounded to nearest inch, for multi-stemmed trees the largest stem was used as the basis for measurement and additional stem diameters were recorded in the inventory notes section

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

- Height Class - the approximate height range of the tree
- Deadwood Percent - an estimate of the percentage of deadwood in the crown of the tree
- Condition Rating - an overall assessment of the health of the tree
- Planting Depth - the location of the root flare with regards to planting depth
- Primary Maintenance Need - the highest priority maintenance need, usually removals or safety pruning
- Secondary Maintenance need - the next most important maintenance need, usually structural pruning or plant health care treatment
- Work Priority - the date by which the primary maintenance need should be completed
- Clearance - hazardous branches, usually low hanging branches that impede vehicle or pedestrian traffic or visually block sight lines
- Utility - a record within a close proximity to overhead or underground utilities
- Notes - a general section to capture other useful information about the site or tree

III. INVENTORY RESULTS AND DISCUSSION

For analysis, the City of Pewaukee's tree population was divided into two categories, street trees and park/municipal property trees. The two categories were defined based on the location information collected. Trees inventoried with the locations termed Street, Natural Area, Building Site, and Other were analyzed as street trees. Park and parking lot trees were labeled Park.

A. Street Tree Inventory

The City of Pewaukee's street tree population consists of 3,054 street records made up of 2,746 trees, 300 vacant planting sites, and 8 stumps.

i. Planting Site Summary

There are 300 potential planting sites within the street tree inventory area that meet the criteria for being a suitable planting site. Suitable planting site records were collected along the major roadways and within neighborhoods. Medians were also inventoried for tree records, but no potential planting sites were inventoried.

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

During the inventory, data on buried utilities and overhead wires was collected. No buried utilities were noted for any of the suitable planting sites, but some of these sites may still be impacted by underground utility conflicts which may prohibit planting.

One of the criteria for being a suitable planting site is absence of overhead wires. This means all the vacant planting sites inventoried have no limitations in term of growth and overall height, but sites with overhead utilities can be planting sites when the appropriate tree species is selected for those locations. Small growing trees such as Serviceberry, American Hornbeam, Hawthorn and Ironwood could be utilized at these locations to limit future maintenance.

According to discussions with City staff, the City does not actively plant street trees. This project was a comprehensive inventory that would look at the current state of the City urban forest and identify possible opportunities. There are many sites in residential neighborhoods suitable for replanting. We suggest the City consider plantings in these spaces to enhance the benefits urban trees provide a community that is described in multiple sections throughout this document. Taking an ownership role over street tree planting will also allow the City to have a direct impact on future tree diversity goals.

Trees prefer large planting spaces because they have more space for root growth. Identifying a suitable planting site with a large width (greater than five feet) creates many options when selecting species to plant and is a feature that many municipalities do not have. Distinguishing between different suitable growth spaces allows managers to prioritize planting sites with larger areas. The larger planting areas in these sites allow a wider variety of trees to be planted and will help the City of Pewaukee have healthier trees.

All in all, (89.9%) 2,746 of the 3,054 street records (stumps not included) have trees (stocking level). This is a higher stocking level than for most of the communities. The normal stocking level is in the 65 to 75% range.

Emphasis should continue to focus on new tree plantings and promoting greater species diversity during the planting process. Since stocking is at an above average level, planting trees is not urgent, but it is an important component of urban forest management. This scenario presents an opportunity to select superior quality tree species when planting budgets are established. If superior tree species replace undesirable species that are removed from the street tree population, the overall value of the urban forest has a greater potential to increase over time.

ii. Species Frequency

Providing for species and age diversity in the urban forest are the two most significant ways to reduce the impact of a destructive pest or disease. Dutch Elm Disease (DED) should have taught us this lesson, but we weren't listening. The current recommendations are, "no more than 30% of one family, 20% of one genus and 10% of one species." There are also advocates for more strict recommendations to consider in striving for greater species diversity, "no more than 20% in one family, no more than 10% in one genus and no more than 5% of any single species, including cultivars and varieties."

Shown below is an example of how this works:

Plant no more than 30% of a family: i.e. Sapindaceae (Soapberry Family)

Plant no more than 20% of a genus: i.e.

1. *Acer × freemanii* (Autumn Blaze Maple)
2. *Acer rubrum* (Red Maple)
3. *Acer platanoides* (Norway Maple)
4. *Acer miyabei* (Rugged Maple)
5. *Acer saccharum* (Sugar Maple), etc.

Plant no more than 10% of a species: i.e. *Acer platanoides*

Optimally, try to have the greatest diversity of species that can be managed. Start planning now for a more diverse urban forest. Finding a wider variety of species will be harder and more expensive, but it is worth it. Work with local nurseries to come up with innovative solutions. Educate policy makers on the necessity to do it right, not fast and cheap. In the long run this will save money, time and effort and increase the benefits a healthy, sustainable urban forest provides.

The 2,746 street trees include 77 different species. The top ten species break down as follows:

Table 1. Top Ten Street Tree Species.

Common Name	Count	Percent
Crabapple	245	8.92%
Norway Maple	194	7.06%
Littleleaf Linden	142	5.17%
Colorado Spruce	141	5.13%
Freeman Maple	134	4.88%
White Spruce	111	4.04%
Callery Pear	102	3.71%
Northern White Cedar	100	3.64%
Spruce	99	3.61%
Green Ash	98	3.57%

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

The species that do not fit the recommendation for 5% species frequency are Crabapples, Norway Maples, Littleleaf linden, and Colorado Spruce. The genera *Acer* (Maples) and *Picea* (Spruce) fail to meet the recommendations of 10% diversity, and should not be planted. Freeman Maples and White Spruce are approaching acceptable thresholds. The rest of the species, genera and families meet these criteria.

Thankfully the inventory update identified only 14 Callery Pear. This species has exhibited growth habits of an invasive tree species and is currently being considered for inclusion to the NR40 invasive species list. The City is in a very good position to address this statewide problem. I recommend proactively banning any future plantings of Callery Pear on public property to avoid future problems.

4 of the 77 different street tree species are outside the common recommendation of no more than 5% in one species. The City can have a direct impact on increasing tree species diversity by implementing street tree planting, though focus will always be needed on this management item. This is not an impossible task. Ash will be removed in the coming years due to emerald ash borer, reducing ash tree frequency in the population. It is promising to note there are roughly only 115 Ash trees left on City streets. This is a testament to the foresight of City leaders to stay ahead of this nuisance pest and the damage it has inflicted on the surrounding area. It will be imperative that more species on the recommended street tree species list (see **Appendix B – Tree Species Recommendations**) be planted as Ash trees are removed.

Within the street tree population, the genus *Acer* 21.92%/602 trees (Maple), doubles the recommendation of no more than 10% in one genus. The City has been busy dealing with the ramifications of EAB on the City's ash population. Any problems with Maple will create a larger problem for the City's urban forest and budgets.

All future planting projects should continue to focus on adding more diversity and quantities to the species mix. Species that could be increased in numbers planted annually include: Yellow Buckeye, Ironwood, Ginkgo, Kentucky Coffeetree, and Swamp White x Bur Oak hybrid.

Norway Maples are the second most common tree (7.06%, 194 trees) in the street tree population. A concern is their tendency to develop girdling roots which is a major maintenance issue. Girdling roots are a combination of a nursery problem, a characteristic of the species, and deep planting. The girdling roots tend to kill the trees about thirty to thirty-five years after planting, just as the trees are getting nice sized. This species, because of its opposite branching habit, has the propensity to develop co-dominant stems and included bark. If left unchecked, serious structural issues can develop. This can be prevented by performing training pruning when trees are young. Weak branch unions lead to this species being more susceptible to large branch failure in storms. They also can become invasive through seed dispersal and germination in unwanted areas. For these reasons, Norway maples are not highly desirable street trees.

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

Ash species (Green, White), have a combined total of 115 trees or 4.19% of the street tree population. Trees within this genus host a number of disease and insect problems other than EAB. Although most of these will not cause the tree's demise, they can be a nuisance. Native ash borers, flower gall mites and plant bugs are the most common insect pests of Ash, while anthracnose and ash yellows lead the list of diseases.

The biggest threat to the native ash population is EAB. This is an exotic wood borer that was found attacking and killing ash trees in Michigan during 2002. Since its detection, EAB has killed millions of ash trees and is now found from the east coast of the United States west to Colorado, and from Texas north into Manitoba. EAB is easily spread through the movement of firewood, logs and nursery stock. It is recommended that an indefinite moratorium continue on all future Ash plantings.

Crab Apples are the most common tree 8.92% (245 trees) in the street tree population. Species within this genus are very prone to disease, such as apple scab. Apple scab is a disease that has increasingly impacted local crabapple populations. Under normal circumstances, apple scab only causes minor defoliation and reduction in overall tree health. Over the past several years, apple scab has been causing more extreme defoliation. This has largely impacted older crabapples, whereas younger trees tend to be more disease resistant. Even though these trees are ideal for planting under overhead wires and at smaller planting sites. Given the current population, the number of crabapples planted should be very limited, but if planting, disease resistant varieties should be utilized.

Honeylocusts are 1.89% (52 trees) of the street tree population. Some common pests and diseases that impact Honeylocusts include plant bugs, leafhoppers and cankers. Plant bugs and leaf hoppers feed on the leaves of the tree causing distorted and damaged leaves. Severe infestations can cause tip dieback. Neither insects is a major health concern or management problem. Honeylocusts can also get cankers that will eventually girdle and kill the tree. The spread of these cankers can be reduced by ensuring young trees are being watered during droughts and trees are being pruned properly. Oftentimes, Honeylocusts don't suffer from pests and make good street trees that are very urban tolerant.

Spruce account for ~14.09% (387 trees) of the street tree population. I believe this is due to homeowners being responsible for tree plantings adjacent to residences. This is a statistic that will require additional attention. There are several common diseases which negatively impact these trees. Both Rhizosphaera needle cast and Cytospora canker cause needle loss and kill branches in the lower portion of the tree. These diseases destroy a tree's form and aesthetics, damage overall health and creates a lot of pruning work. Conifer trees should not be used as street trees because of their pest problem, and they cause view and clearance obstructions in many street settings. They may not initially be a problem on street, but as they grow, increasing in size, they can become problems. All conifers, including Spruce, should be watched to determine when they become a hazard so appropriate action can be taken to mitigate their risk.

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

Silver Maples make up 3.24% (89 trees) of the street tree population. They are large fast-growing trees. This may seem appealing when planting new trees, but this same growth rate causes them to form weak wood and develop poor structure. These characteristics make Silver Maples prone to storm, wind and ice damage. They don't have any major pest problems that affect the overall health of the tree, but given the prevalence of Maple trees within the community if a pest were to damage or kill of Maples trees it would have the same effect as EAB or DED.

It is important to continue the planting of trees with mature heights of 30 feet or less. Some smaller scale trees include: Japanese Tree Lilac, Ironwood, Serviceberry and American Hornbeam. These are important to use in areas with power lines where shorter trees are preferred or in smaller growth spaces (less than five feet between the back of curb and sidewalk).

iii. Street Tree Planting

The City of Pewaukee should seriously consider implementing a street tree planting plan. Though the number of potential planting sites (300) within the City is minimal compared to other communities, planting is an important component in the overall urban forest plan. Proper species selection is a key to reducing future problems and costs. **Appendix B – Tree Species Recommendations** contains a list of recommended trees and ones to avoid. Planting sites should be greater than 5 feet in width between sidewalk and curb within the ROW to allow for more choices in species and healthier plants due to larger root zones.

When planting, it is best to plant trees of the same species in groupings or using mixed species with similar mature size and growth habit. Alternating species every other tree can create a checkerboard effect that is not very attractive as the trees mature. By planting in groups of three to five, the desired effect of the plants will be achieved. Also, when possible, plant in the back half of the ROW to protect from vehicular and road salt damage. This is particularly important with unrestricted locations when those areas are chosen for planting in the future.

The following modifications are recommended to be incorporated into the “Pewaukee Arboricultural Specifications Manual”.

- Place an indefinite moratorium on the planting of Ash and Maple species, due to insect threat and the high frequency of Maple trees throughout the City.
- Under power lines, plant only trees that are small at maturity (less than 30 feet in height).
- Discourage planting of conifers such as Spruce and Pine species in the ROW by abutting property owners.

Early care is important. Trees will need watering for a two to five-year period depending on how bad the dry periods are. The longer the drought, the more the trees will need to be watered. Water is probably the single most important limiting factor to establishment and good growth in our harsh urban environment.

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

Pruning after the trees are established (Training Pruning) is also very important. Try to visit and prune newly planted trees, on average, at least every three years up until they are 6 inches in diameter. The frequency of training pruning will vary depending on the tree species. Some species of young trees, such as hybrid Elms, will require more frequent training pruning (one to two years) than other species, such as Oaks (three years or more). Yearly inspections of new tree species should occur for the first five to eight years to determine the frequency of appropriate training pruning. This will ensure that proper structural pruning is taking place. What can be taken off a tree with a hand pruner or handsaw in year three will need a chain saw in year fifteen. It is not only more expensive but is also more stressful on the tree to wait. Early training pruning will go a long way to reduce costs and provide a safer urban forest by directing future growth.

B. Park/Municipal Property Tree Inventory

City parks/public properties that were inventoried include: Nettesheim, Balmer, South, Sports Complex, Springdale, Wagner, and assorted City facilities.

A total of 771 park and municipal property records were collected consisting of 719 trees, and 52 stumps. New Park tree vacant planting sites were not inventoried as part of this project.

I. Species Frequency

The 309 existing park trees are made up of 41 different species. The top ten break down as follows:

Table 2. Top Ten Park and Municipal Tree Species.

Common Name	Count	Percent
Green Ash	148	20.58%
Colorado Spruce	107	14.88%
Northern White Cedar	51	7.09%
Austrian Pine	32	4.45%
Freeman Maple	31	4.31%
Black Walnut	30	4.17%
Norway Spruce	30	4.17%
Eastern Cottonwood	24	3.34%
Swamp White Oak	20	2.78%
White Spruce	20	2.78%

Green Ash, Colorado Spruce, and Northern White Cedar are species that exceed the recommended 5% rule. More of other genera, species and varieties on the recommended street and park tree species list need to be planted (see **Appendix B – Tree Species Recommendations**).

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

Tree species to consider suitable replacement park trees are Kentucky Coffeetree, Serviceberry, Ginkgo, White Fir, Baldcypress, Yellow and Ohio Buckeye, Catalpa, and Ironwood.

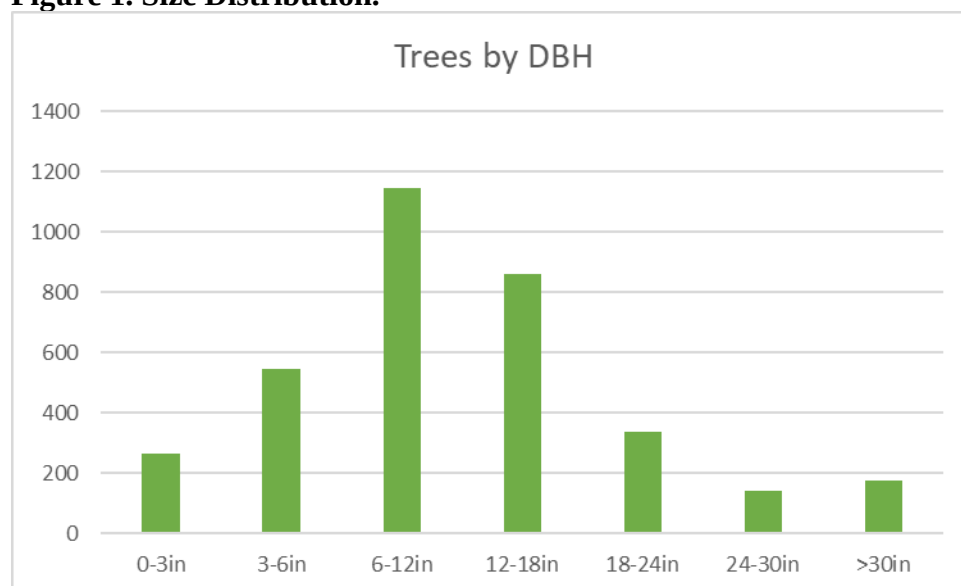
C. Public Tree Size, Condition and Value Discussion

i. Size Class Distribution

The City of Pewaukee’s public tree inventory shows a bell-shaped curve size distribution of trees that is heavily weighted in mid-sized trees (**Figure 1. Size Distribution**). Most trees (57.78%) are in the established tree diameter classes of 6-18 inches in trunk diameter. These trees are considered established in the landscape and will grow exponentially, adding value to the landscape. The size class distribution tapers off in the larger size classes, as these larger/older trees decline and are removed. The population of newly planted trees from 1”-6” trunk diameter (812, 23.43%) should be increased. More trees should be planted to replace trees that are naturally lost to old age, or prematurely removed due to invasive, damaging pests (the relationship between ash trees and emerald ash borer).

Focus on planting is critical to maintain the populations of younger trees. Future maintenance should address structural issues in younger trees. As trees becomes larger, trying to correct these issues becomes costlier and less effective. Many of the problems with form and structure can be corrected with regular maintenance while the trees are young or moderately young. This also extends tree life and reduces future maintenance costs. The overall condition of younger trees can be improved for less expense than with larger trees where poor structure and form have gotten to the point that they are no longer correctable.

Figure 1. Size Distribution.



**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

ii. Condition Rating

The overall condition of the City Street trees is an opportunity for improvement concerning widespread co-dominant stem structural issues (57.95 % of all trees). There are 7.8%, 272 trees within the 0 to 45% condition classes. Trees in this range are very poor quality and warrant removal. The rest of the trees are distributed between the 50 to 55% range (2.5%, 86 trees), the 60 to 65% range (48.9%, 1,696 trees), the 70 to 75% range (38.5%, 1,334 trees) and trees rated 80% and greater (1.9%, 67 trees). Trees in the 50 to 55% range are usually in poor health and condition and could be considered for removal in the future. The 60 to 70% range has trees that are less than average condition. The 75% range encompasses trees that are good and average in terms of overall health for a street tree of that species. Trees rated 80% and greater are in great health and have excellent structure. The majority of the City's trees are in condition classes of 70% and lower which will require improvement.

Co-dominant branching was noted on 57.95% (2,008 trees) of all trees. Co-dominant stems are an undesirable tree structure that are more likely to fail as stems rip apart in severe storm events. Trees that have been properly pruned throughout their life have better structure and have a better chance of weathering severe storm events. Not all storm damage can be prevented, but a routine pruning program used to promote better tree structure can minimize the amount of storm damage in severe weather.

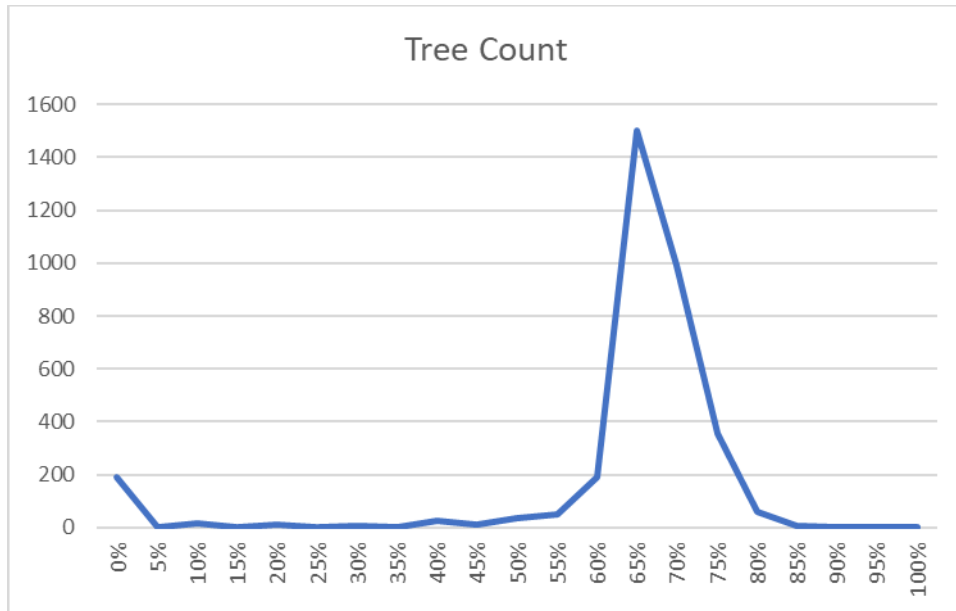
Younger trees (1 to 6 inches diameter) made up 23.43% (812 trees) of the tree population. 65.5% (532 trees) of those young trees have co-dominant branching. The City needs to consider a more proactive role managing trees in the street right-of-way. Maintenance should be focused on some of the larger diameter trees in this group before structural problems become worse. Younger trees that are having difficulty becoming established may need to be removed and replaced.

There is opportunity to improve these condition ratings because younger trees tend to be more vigorous. They require more frequent pruning visits, once every two to three years versus every five to seven years for routine prune (trees greater than 6 inches in diameter). Supplemental watering for at least two years after transplanting is also a critical component of early tree maintenance. It is imperative to keep on top of the pruning and moisture requirements of younger trees so their condition rating improves as they grow in size and they don't become liabilities later in life. The key is to strive to maintain a high condition as the trees become older.

In the larger trees ranges (greater than 6 inches in diameter), 89.9% (2,257 trees) are in the condition classes greater than 45%. The rest of these trees (10.1% or 254 trees) were rated 45% or less. The focus of routine pruning in these larger diameter size classes should be with trees that are currently in the 60 to 70% condition classes. There is a good chance for a number of these trees to move into higher condition classes, if a five to seven-year routine pruning schedule can be sustained.

The condition of the urban forest needs improvement with most of the trees in condition classes 70% and lower. There is the potential to improve the condition of some of the trees in the lower condition classes. Focus should be given to younger trees that can be training pruned to improve structure. Structural issues are easier to address when the trees are smaller. Larger trees can also benefit from Safety and Routine Pruning. Targeted pruning of large trees in the 60 to 70% condition classes, specifically Norway Maples and Freeman Maples.

Figure 2. Condition Rating Distribution.



iii. Maintenance

Overall the City of Pewaukee' urban forest is vibrant and health but will always need improvement. A renewed focus on maintenance; primarily training/structural pruning, planting and young tree aftercare will improve condition ratings and help guarantee the presence of healthy trees that add value to the community for many generations to come.

Table 3. Maintenance Needs.

	Diameter Range					Total
	1"-6"	7"-12"	13"-24"	25"-35"	36"+	
Remove	23	147	127	12	6	315
Remove Stakes	13	3	0	0	0	16
Routine Prune	0	607	691	149	61	1508
Safety Prune	1	8	22	30	16	77
Training Prune	626	121	0	0	0	747
Remove Stump	0	8	48	2	0	58
Tree Heaving Walk/Curb	0	0	0	0	0	0
Girdling Root	3	5	9	1	0	18
Watch	304	334	204	17	6	865

***totals will not match total tree population, some trees require multiple maintenance actions**

Stumps (58) should be removed. Stump removals are minimal and should be accomplished in the near future. Opening up these sites for new planting will help increase the age and species diversity across the urban forest.

Trees in the 0 to 45% condition classes, with notable cracks or decay and severe pest problems such as EAB were classified as a removal. These trees are a high risk and pose a hazard and threat to the community. They should be removed within the next year.

The City should focus on planting a diverse selection of trees ensuring their streets, parks and public properties are populated with a primarily young and varied urban forest. Proper planting techniques should be utilized to prevent girdling roots that increase maintenance costs and damage the tree's overall health and value. Watering is essential for new plantings, especially during periods of drought or low rainfall. If stakes are utilized, they should be removed as trees become established and establish their own root flare. Currently, there are 16 trees with stakes. They should be removed within the year. Taking the time to properly maintain trees within their first several years of life can increase the overall health and value of these new trees for years to come.

Training Pruning is another important component of tree maintenance and care. Pruning trees when they are young, to improve structure, can reduce future maintenance costs and increase tree health and condition. Trees should undergo training pruning when they are less than 7 inches in diameter. Trees that are closer to the end of this range should be a priority for training pruning before they get too large and structural issues become harder or impossible to resolve. Training Pruning should take place at two-to-three-year intervals to spread out pruning sessions so any structural issues don't have to be solved with major pruning cuts.

The focus of Routine pruning in trees greater than 6 inches in diameter should be with trees that are currently in the fair to excellent condition classes. There is a good chance for a number of these trees to move into higher condition classes, if a five to seven-year routine pruning schedule can be sustained.

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

Conifers, such as Spruce and Pines, are not suitable street trees. These trees should be watched and reassessed every five years to ensure that don't become clearance and siteline issues for sidewalks and streets. When they become hazardous, these trees should be remove. Overall, abutting property owners should be discouraged from planting trees within the ROW, especially conifers.

Safety pruning is pruning to reduce a tree's risk and hazard to the community. It is needed when a trees canopy is made of 15% or more deadwood 2 inches or larger or there is a clearance issue. Clearance issues can include height of branches over sidewalks and streets, conflicts with lights and signs and visually block views, especially near intersections. There are 77 trees that require safety pruning to eliminate the hazard. The young trees should be raised as they become established to prevent these problems (part of training pruning). Be sure not to elevate the existing canopy too much at one time, or the tree's health can be severely affected.

Focused tree maintenance is essential for maintaining and potentially increasing the value of the City 's urban forest.

iv. Public Tree Value

Total public tree value for the inventory of the City of Pewaukee is **\$5,008,356**. This equates to an average value of **\$1,602** for each inventoried tree along the City 's streets and in parks. Given five to ten more years of growth to boost diameter and height, it becomes obvious that the value of the City of Pewaukee' urban forest would be even higher.

IV. REVIEW AND CONCLUSION

The City of Pewaukee has an urban forest with achievable improvements needed in species diversity, size class distributions and tree conditions. Species diversity almost meets old guidelines, but a goal of reaching newer recommendations with greater diversity should be made. The size class distribution of the forest can be improved by increasing planting efforts. Tree conditions are the area of greatest need. These ratings will be improved by increasing focus on training and structural pruning and increasing regular maintenance cycles. All these goals can be obtained through a more proactive approach to forestry management throughout the City.

A tree inventory is a dynamic, powerful management tool. The inventory should be updated to reflect work performed such as new planting and when trees are removed. The entire urban tree inventory should be re-inventoried and updated in 2027.

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

URBAN FOREST MANAGEMENT PLAN

I. INTRODUCTION

The purpose of this management plan is to review the data collected in the street, park and municipal property tree inventories and through analysis, develop management scenarios for both tree populations. These management strategies will build upon current practices and provide cost effective suggestions that will improve the health, safety, diversity of the City 's urban forest.

The City of Pewaukee' urban forest (combined street and park trees) is healthy but requires improvement. Focus on structural pruning and regular maintenance of trees will improve the overall health over time. Focused maintenance (i.e. training pruning, proper mulching and young tree watering) early in a tree's life will be easier than trying to correct a lot of problems later. As it is, there will be continued work in the future due to changing maintenance needs as the trees grow older. This maintenance is imperative for the quality of life, property values and especially the safety of the City of Pewaukee' citizens.

The priorities in the Management plan are:

1. Removals, including stump removal
2. Safety and Clearance pruning
3. Training pruning (10% of the inventoried trees need this service)
4. Yearly inspections of lower condition class trees
5. Identify any additional training needs for City crews to acquire proper tree skills (planting, pruning, hazard tree recognition, insect and disease identification, etc.)
6. Expand the recommended species list.
 - a. Proper species selection and diversity are key to reduced future costs and a healthy urban forest
7. Regular maintenance pruning is needed to keep trees healthy

Removals and safety pruning must be given priority to eliminate hazards. Training pruning, performed early in a tree's growth cycle, establishes proper branching structure and reduces long term maintenance costs. Focus must be maintained, so that low priority items that are easy to do, are not moved up. It is imperative to deal with the most important problems first. As these are dealt with, maintenance costs will decrease, safety will be greatly improved and the value of the City of Pewaukee' urban forest will increase.

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

II. STATEMENT OF PURPOSE AND SCOPE

A. Purpose

Build upon the foundation of the comprehensive urban forestry street and park/municipal property tree inventory updated in the summer of 2022 by re-prioritizing field operations along with policies and procedures as needed to enhance the management of the urban forest resource.

B. Scope

This plan provides an outline of the community's urban forestry goals. It gives citizens, community decision makers and the staff of the City of Pewaukee a clear set of strategies to achieve these goals. These goals and strategies, together with the accompanying management plan, propose a timetable of implementation and where possible, provide estimated costs to achieve the goals set forth.

III. MISSION STATEMENT

Where appropriate planting sites are present, create an aesthetic atmosphere in the City through maintaining a diversity of high quality healthy young, intermediate and mature trees. By providing quality tree care on a low cost and regular basis, public trees will continue to be a significant asset to the City. Quality care of public trees will also inspire and educate residents to properly care for trees on private property.

IV. GOALS & STRATEGIES

A. GOAL 1: Maintain the City of Pewaukee' urban forest in a cost effective, healthy and safe condition through proper care and maintenance of trees.

Strategies:

- Use the 2022 street and park tree inventories results to establish a maintenance action plan (part of the management plan).
 - Perform comprehensive updated inventory in 2027
- Implement maintenance goals from the management plan.
- Review yearly work plan with the City Board in the summer of each year prior to budget submission to the Board.
- Ensure safety with regular inspections of street, park, and municipal property trees.
- Promote homeowners to assume a sense of ownership in public trees by encouraging them to perform seasonal maintenance (i.e. mulching and watering).
 - City crews and contractors set an example by doing proper tree care
 - Collect information from (Arbor Day Foundation, DNR, etc.) to be shared with citizens. Set up public events to distribute information

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

- Create tree related articles for the City website
- Establish a “best management practices” manual that contains standards and specifications for performing tree work.
 - Continue City employee training in proper tree care
 - Hold at least one membership in International Society of Arboriculture (ISA) and Wisconsin Arborist Association (WAA) and have multiple employees attend WAA meetings
 - Strive to get at least one person on staff to become an ISA Certified Arborist
 - Consider hiring only private contractors that agree to adhere to proper American National Standards Institute (ANSI) standards and who employ Certified Arborists
 - Enforce tree protection standards to be part of Public Works contract specifications
 - Educate others of the importance of trees, along with the current condition and goals for City of Pewaukee’s urban forest
 - Make sure the importance of the role other City departments in maintenance and development of the City ’s Urban Forest is made clear.
- On a regular basis, update 2022 inventory to ensure maintenance records are kept current.
- Pursue “Tree City USA” status.

B. GOAL 2: Establish and maintain maximum tree cover, age and species diversity, with proper site and species selection to minimize hazards and maintenance costs.

Strategies:

- Implement planting goals from the management plan.
 - Review and update recommended species list
 - Increase budget dollars for street and park tree planting
 - Increase plantings in areas that were identified in the GIS inventory as currently lacking street trees
- Seek out additional ways to provide funding for planting.
 - State grants (DOT and DNR)
 - Community groups
 - Businesses (homeowner discounts from nurseries where the City is purchasing planting stock)
 - Strengthen Developers agreements to reflect the City ’s management plan where they are utilized

C. GOAL 3: To have an educated public that knows what proper tree care is.

Strategies:

- Promote public awareness through publications and appearances at civic groups and schools.
- Discuss the importance of tree care with City departments, contractors, and residents.

Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022

V. CURRENT SITUATION

A. Ordinances

Current ordinance language with respect to care and protection of public trees is minimal and spread throughout multiple chapters. See below:

Chapter 7.02. Public Nuisances Affecting Peace and Safety.

- Defines the parameters of what is considered a nuisance tree or nuisance tree limb.

Chapter 7.04 Dutch Elm Disease

- Defines Dutch Elm Disease as a public nuisance, and outlines how it will be monitored and managed.

Chapter 18.0304 Preliminary Platting Procedure

- Requires a tree inventory be included with any land division plan and submitted Plat.

Ordinance Recommendations

- It is recommended that a public tree ordinance be drafted that pulls all the existing provisions into one chapter. It needs to be comprehensive and should primarily cover the planting and removal of trees within public rights-of-way. It should also contain provisions governing maintenance or removal of private trees which pose a hazard to the traveling public. Once a tree ordinance is enacted, many of the existing sections can be repealed. Below is a sample table of contents.

CHAPTER XX – URBAN FORESTRY

XX.20 Purpose and Intent

XX.21 Definitions

XX.22 Tree Advisory Board

XX.23 Nuisance Trees Prohibited

XX.24 Standards and Specifications

XX.25 Public Nuisances, Declaration and Abatement

XX.26 Planting, Maintenance and Removal of Public Trees and Shrubs

XX.27 Tree Protection During Construction

XX.28 Private Tree Maintenance

XX.29 Penalty

XX.30 Appeals

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

This chapter would be the overarching section in the Pewaukee Municipal Code that establishes policies, regulations and standards necessary to insure that the community will continue to realize the benefits provided by its urban forest.

- Include in the nuisance section, provisions for any potential pest/disease that could threaten the health of the City's urban forest. Keeping this definition broad, and avoiding identifying specific threats, will allow the City to be flexible in responding to new pests and diseases that establish in the area over time.
- Creation of a Public Tree Care Manual. A good example for the City of Howard (Arboricultural Specifications Manual) can be found at the following website: <https://www.Cityofhoward.com/DocumentCenter/View/362>. Also consider, *Best Management Practices for Tree Care Operations* published by the International Society of Arboriculture and various *ANSI Standards for Tree Care Operations* published by the American National Standards Institute. These are excellent supplements to include in a procedures manual.
- **Appendix H** is intended to provide resource information regarding sample Tree Protection Provisions.

SPECIAL NOTE:

Inserting large amounts of detailed arboricultural information in an ordinance makes it cumbersome and difficult to change. One of the advantages of having management standards and specifications separate from the ordinance is the ease of making changes. A change made by the City Forester or a board is done more quickly and doesn't involve the politics of changing the City Code. Another advantage to separate standards and specifications is that exceptions can be authorized by the City Forester whereas ordinances tend to be absolute. Greater detail can be written into standards and specifications when they are separate, without fear of not being able to change it in the future.

Through these processes, the City of Pewaukee's trees will receive the protection and consideration they warrant.

B. Tree Administration

The responsibility for all street trees is overseen by the Streets Superintendent, the responsibility for all parks trees is overseen by the Director of Parks and Recreation. This management plan should help establish priorities and commitment in the City system for nurturing the public tree population. A few problems need to be dealt with now, but in the long term, training and maintenance pruning along with new tree planting are the main priorities for future safety, health and benefits of the urban forest. Time needs to be set aside and taken for maintenance of street and park trees.

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

The City currently employs an adequate number of public works staff to manage forestry in-house (minus contracted treatments/removals). These staff members are comfortable in forestry operations using existing forestry equipment and have gone through various formalized forestry training events. Forestry field duties are delegated to public works staff as time allows. This system is adequate when responding to resident forestry requests or tree removal needs. To keep up with long term care of the City's urban forest, a half-time forestry position should be created.

It is critical that this position be implemented as it is important to have a "go to" person for forestry issues. The public, elected officials, other City staff and state staff need to know who the primary contact is. Also, this person would be the focus of training and support and reduce having multiple people answer questions differently and leading to conflict (i.e.. one person asks a parks staffer about pruning along a drive, then asks a public works employee - you can get opposing answers). It can also help in pulling workload from staff (for calls, emergencies, staff questions, etc.) that are not trained or equipped to deal with tree issues.

It is discouraging to only see that roughly 2% of the Public Works/Parks budget is utilized for forestry related activities. The public tree inventory report within this document identified ~57.9% of public trees that have poor structure. This is a direct result of deferred, regular maintenance. Establishing a budget now to adequately maintain the City's tree population will begin the correct process and start the City's forestry operations on the right track. The financial and administrative support of the City Administrator and elected officials is crucial to help in moving the urban forestry program forward with an overall focus on the goals and objectives. The City will need to make changes to meet this challenge.

An internal assessment of Public Works Department highlighted a need for an ISA Certified Arborist. The City does have staff comfortable in urban tree care. A Certified Arborist with technical experience will provide the needed skill set to spread the workload and focus on other tree care activities. Employees should be kept current with the latest techniques and procedures with staff training days. Appropriate training modules include tree planting, training pruning, chain saw safety, and felling techniques. Continued training will promote safe and efficient work practices.

Currently the Department is adequately stocked with forestry equipment such as chainsaws, various assorted small equipment, and various large loading, lifts, and chipping equipment.

By utilizing the evolving GIS tree inventory, the Department should attempt to establish a rotational pruning cycle within the City. The goal would be to set up a tree pruning cycle based on a 5 to 8-year rotation. The opportunity the City is currently presented with is the chance to develop a dashboard within their inventory app that is designed specifically for their forestry needs.

It is important that the work strategies are well thought-out so that they can fit correctly into the existing system of overall departmental responsibilities. A critical factor is to stay current with arboricultural practices. Opportunities for appropriate training for the staff are a priority of

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

management. It is easier to train someone to run a lawn mower than it is to train a person to perform proper pruning. Improper pruning can have long term negative impacts on tree health and City budgets.

An area that is not seen as a problem is wood residue utilization. Currently wood residues generated by City forestry operations are utilized by residents or stored at the old City dump.

C. Inventory Summary – All Public Trees

The City of Pewaukee has an urban forest that needs improvement within species diversity, size distribution and condition ratings. All of these components can be improved with focused management over the years.

The distribution of size classes is a bell curve showing an uneven aged forest with few young trees (23%) within the 1 to 6-inch diameter classes. 58% of trees are in the established and fast growing 6 to 18-inch diameter classes. An uneven aged forest is ideal because as the older age tree classes succumb to mortality and removal, there are numerous young healthy trees that will continue to grow and preserve benefits provided by the overall urban forest. The City can improve on their current situation by committing to increased tree planting that will bolster future population growth.

Approximately 88% of public trees have condition ratings 70% or lower. This is concerning. Improvements can be made using training, routine and safety pruning. Focus should be placed on safety pruning which can eliminate hazards and training pruning which can correct structural issues improving the health of the tree and reducing future maintenance costs.

Overall, the City has okay species diversity that comes close to meeting the current tree diversity recommendations. There should be no future planting of *Acer* (Maples) *Picea* (Spruce) and *Fraxinus* (Ash).

Maple trees make up a large portion (20%) of the overall forest. Norway Maple is the main maple species in the City. Norway maples tend to have co-dominant stems, a poor structural condition. Norway maples are also prone to girdling roots and also tend to have poor structure.

Plant species that are not currently represented in the inventory or have very low numbers but have unique attributes and necessary hardiness include: Swamp White x Bur Oak hybrid, Bitternut Hickory, Ohio Buckeye, Baldcypress, and Ironwood.

VI. REVIEW OF RESOURCE & DISCUSSION

A. Introduction

Priorities in the Goals section for the public trees were set with safety being the most important criteria. Therefore, the first items dealt with were removals (incl. stumps) and safety pruning. A routine pruning program should be implemented on a limited basis, while focusing on taking care of newly installed trees. Ongoing street tree planting is important, but will need to be deferred until high priority tasks are completed. The City should strive to meet a minimum of 50 trees planted annually, and emphasis should be placed on facilitating other funding means to increase this number. Based on vacant planting sites (300 sites), by planting 50 trees per year the City will reach full stocking within 6 years. This number does not factor in replanting sites where trees were removed. Training pruning needs to be implemented as an important means of directing future growth and reducing costs for the City's urban forest. After these programs are up and running, the focus can be spread out to include more routine pruning.

It is important to stay focused on the priorities. **Table 4 – Estimated Costs for a Five-Year Implementation Schedule Public Trees – In House** summarizes the expenses by area and function per year. This table was compiled using the priorities from the Goals section and data from all the trees included in the inventory. As problems are corrected, there may be a reduction in cost over time. The yearly budgets are only suggestions and depend on overall funding levels available.

B. Estimated Costs

All projected costs in **Table 4** are made with the assumptions that work will be performed by City crews with an average cost of \$48.00 per hour for full-time staff. Costs have been calculated managing street and park trees together as an urban forest. Actual costs could vary and no factor for inflation has been included.

Table 4. Estimated Costs for a Five-Year Urban Forest Implementation Schedule Public Trees – In House.

Estimated costs for each activity			2023		2024		2025		2026		2027		Five Year Cost
Activity	Diameter Class	Cost/Tree (\$)	# of trees	Total Cost	# of trees	Total Cost	# of trees	Total Cost	# of trees	Total Cost	# of trees	Total Cost	
TREE REMOVALS	1-6"	50.00	0	0.00	23	1150.00							
	7-12"	200.00	0	0.00	147	29400.00							
	13-24"	600.00	126	75600.00	1	600.00							
	25"+	875.00	18	15750.00									
Activity Totals			144	91350.00	171	31150	(M)	12000.00	(M)	12000.00	(M)	12000.00	158500.00
PRIORITY PRUNING (SAFETY, CLEARANCE, DEADWOOD)	1-6"	25.00	0	0.00	1	25.00							
	7-12"	50.00	0	0.00	8	400.00							
	13-24"	100.00	0	0.00	22	2200.00							
	25"+	200.00	0	0.00	46	9200.00							
Activity Totals			0	0.00	77	11825.00	(M)	4000.00	0	4000.00	(M)	4000.00	23825.00
TRAINING PRUNING	1-6"	37.50							150	5625.00	476	17850.00	
	7-12"	75.00							121	9075.00	0	0.00	
Activity Totals			0	0.00	0	0.00	0	0.00	271	14700.00	476	17850.00	32550.00
ROUTINE PRUNING (MAINTENANCE)	7-12"	75.00			0	0.00	0	0.00	0	0.00	607	45525.00	
	13-24"	150.00			0	0.00	370	55500.00	321	48150.00	0	0.00	
	25"+	300.00			183	54900.00	37	11100.00	0	0.00	0	0.00	
Activity Totals			0	0.00	183	54900.00	407	66600.00	321	48150.00	607	45525.00	215175.00
TREE PLANTING	Site Prep	50.00	0	0.00	0	0.00	50	2500.00	50	2500.00	50	2500.00	
	Tree Cost	200.00	0	0.00	0	0.00	50	10000.00	50	10000.00	50	10000.00	
	Planting	75.00	0	0.00	0	0.00	50	3750.00	50	3750.00	50	3750.00	
Activity Totals			0	0.00	0	0.00	50	16250.00	50	16250.00	50	16250.00	48750.00
OTHER MAINTENANCE	Stake Removal	12.50	0	0.00	0	0.00	0	0.00	50	625.00	50	625.00	
	Watering (3x)	75.00	0	0.00	0	0.00	0	0.00	50	3750.00	50	3750.00	
	Mulching	15.00	0	0.00	0	0.00	0	0.00	50	750.00	50	750.00	
	Watch	12.50	175	2187.50	175	2187.50	175	2187.50	175	2187.50	175	2187.50	
	Stump Removal	8.00	1061	8488.00	(M)	5000.00	(M)	4000.00	(M)	3000.00	(M)	3000.00	
	Girdling Root	125	18	2250.00	0	0.00	0	0.00	0	0.00	0	0.00	
				12925.50		7187.50		6187.50		10312.50		10312.50	46925.50
Totals per Year				104275.50		105062.50		105037.50		105412.50		105937.50	525725.50

(M) = REGULAR MAINTENANCE ITEM REOCCURRING YEARLY OR ON A CYCLE

In House cost based on ~\$48.00 per hour

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

C. Summary

The data projected in **Table 4** was extrapolated directly from the database created from the public tree inventory update that was conducted during the spring of 2022. The budget provides a starting point for City staff to see what the current needs are with respect to the public tree population. Staff will have to make some priority choices to keep cost within each annual budget allocation.

Overall costs (including streets and parks) projections for the first five-year period of the Implementation Schedule for all public trees averages about \$105,185 per year over the projected five years. This would be a significant increase in funding from the current method of operations within the City. This plan has highlighted the importance of a healthy and growing urban forest, and the benefits it returns to the managing municipality. To realize to maximum benefits provided by a vibrant urban forest, the City of Pewaukee should seriously consider changing their reactive management approach to a more proactive implementation of forest management relating to trees in public spaces.

Supplementary funding might be secured through additional Urban Forestry Assistance Grants for implementation of this management plan. There are also other possible funding sources such as American Transmission Company's Pollinator Planting and Community Planting Programs. Additional funding sources include fundraising events in conjunction with the business community or possibly homeowners paying for the wholesale cost of the trees selected for street plantings and the City paying for the planting labor.

Realize that the costs in the Implementation Schedule are only projections. As stated before, removals and safety issues are of priority. Years three, four, and five are when most routine pruning would expand in activity level.

D. Implementation Detail

i. Tree and Stump Removal (see Table 4)

Tree removals (315 total) are taken care of during the first two years of the budget. Larger trees within the 13 to 24-inch, and greater than 25-inch diameter classes are likely the most hazardous. After 2024 this activity becomes a regular maintenance item with \$12,000.00 budgeted annually for this expense. All stump removals are completed in the first year. This becomes another regular maintenance expense with an annual budget of \$3,000.00. Since some time has passed from when the inventory was concluded to when this management plan is completed, several of the trees in this category may have already been removed.

ii. Safety and Clearance Pruning (see Table 4)

Safety pruning (deadwood, broken limbs hanging in trees and clearance issues) involves 77 trees in total to be completed in 2024. After work on these trees is completed, \$4,000.00 is budgeted

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

every year as a regular maintenance item. Having the trees on a routine pruning cycle of every five to seven years will prevent most of the problems that are now being corrected in the safety category.

There are 54 trees with noted clearance issues. Clearance Pruning is needed to eliminate these hazards that interfere with foot and vehicle traffic and view obstructions. When raising trees, they do not have to be raised evenly. The street side can be raised to allow for truck clearance and the walk side can be left lower to keep more crown surface. View obstructions at intersections and clearance for lights and signage need to be resolved and maintained.

iii. Training Pruning (see Table 4)

The corrective training pruning is deferred to the final 2 years of the five-year rotational pruning schedule. Some trees, because of diameter increase, will move into the routine prune category. Others, because of their species or habit of growth, may be able to be skipped for a rotation. This category involves 747 trees ranging in size from 1-to-12 inches trunk diameter. After 2027, \$5,000 should be budgeted annually to prune newly planted trees.

Young trees, depending on the growth habit of the species, should be pruned every two to three years for the first ten years of the establishment period. This is very critical for maintaining street and sidewalk clearances. At the same time, a young tree cannot be raised up (removing lower limbs) too fast or it will not have enough crown area (leaf surface) and will become susceptible to other stresses.

Even more important than clearance pruning, training pruning creates proper structure in the trees. This not only makes the trees safer but will also greatly reduce future pruning expenses. The amount of time and money it takes to remove a one-inch branch with a hand pruner in year five as opposed to using a chainsaw at age 30 is obvious. This can greatly reduce future pruning expense and reduce tree decay along with stress.

iv. Routine Tree Pruning (see Table 4)

This is regular maintenance pruning for all trees (including mature tree pruning). It is crown cleaning pruning that includes training and clearance pruning as needed. As the trees grow older, this category will become even more important.

All trees should be on a five to seven-year pruning cycle to keep the trees at maximum health and to prevent most problems from developing. The number of trees requiring routine pruning increases over the course of the budget as resources previously allocated towards removals and safety pruning become available for regular maintenance such as routine pruning. In fifteen years, the number of trees requiring routine pruning could double and will increase even more over time as the trees mature.

Once the problems are corrected, not budgeting to this area may save money for a year or two. However, problems will reappear needing more money to correct and compromising the safety of citizens. The most cost effective and safe way to manage trees is with routine maintenance pruning. You don't wait for trucks to breakdown before changing the oil because usually it is too late by then! Tree maintenance prevents problems, extends the life of the tree and reduces costs.

v. Tree Planting (see Table 4)

The City currently plants approximately 10-12 park trees per year. This number is insufficient based on the number of potential vacant planting sites (300) being available. These sites have been identified in the street tree inventory. Using the visual mapping information in GIS, management can readily discern where the greatest need for future plantings should take place. It is important to continue introducing new tree species into the street tree population to keep and improve the diversity of the population.

If the City uses outside contractors for planting, a primary focus should be to establish planting and aftercare specifications (see **Appendix F – Planting Specifications**) that will be adhered to by all private contractors planting in the public ROW. Inspection and enforcement of the specifications is critical at planting time.

It is recommended that a community wide planting plan be developed after the highest priority tree problems are corrected (2025 or 2026). Do not use conifers for street side planting, eliminate planting *Acer* (Maples) and *Fraxinus* (Ash) and continue to add more variety in species planted. There are many options to help fund planting; from involving community groups, grants for planting, partnerships with businesses, projects tied to highway work, etc.

The planting that does take place should only be trees from the list of Recommended Tree Planting List (**Appendix B: Tree Species Recommendations**). This is set up to ensure that the proper size tree is used under utility wires or in a narrower tree terrace situation.

Better quality (single leader) planting stock should be specified and required when ordering nursery stock. The City should expect to receive quality nursery stock from its suppliers that do not exhibit poor structural problems. By using quality nursery stock, the City will be able to reduce the amount of training pruning time spent correcting problems created in the nursery. This is best accomplished by purchasing plant material from nursery firms that are members of the Wisconsin Nursery and Landscape Association (WNLA).

vi. Tree Stake Removal (see Table 4)

There are 16 sites where tree stakes were still in place supporting younger trees. Stake removal is important to prevent potential damage to the trunks of these trees. If the stakes are left on too long and are extremely taut, there is a risk of girdling taking place and causing restriction of water and nutrient flow between the roots and crown, potentially leading to dieback in the crown.

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

Tree stakes should not be left on for more than two growing seasons. Beginning in 2026, hours are budgeted to remove stakes systematically from trees that were planted one year previously.

vii. Young Tree Watering (see Table 4)

A most critical phase of new tree establishment is young tree watering. Through public awareness and education most newly planted street trees can be watered by the adjoining property owner. This saves the City substantial employee-hours that can be redirected towards other tree maintenance activities including new park/municipal property tree watering. Supplemental watering of newly planted trees during the first two to three years after planting is crucial to their survival, becoming established and beginning vigorous growth. This initial care sets the course for getting trees started on the right path and reduces their chances of succumbing to insects, diseases or environmental stresses in the future. Minimal dollars have been budgeted to provide two visits to newly established trees during the course of a summer.

It is important to realize that more plants are lost to over-watering than to under watering. Roots need air just as much as they need water. Always check the moisture level under the mulch before watering.

viii. Mulching (see Table 4)

Creating mulched beds around street trees is important to reduce damage to the base of the trees from mowing and string trimmer equipment. It also creates a superior rooting area for improved tree vigor and better aesthetics. When trees are being mulched, care should be taken to avoid piling mulch against the trunk (see **Appendix F – Planting Specifications**). This work needs to be ongoing project of the department. Maintenance funds need to be budgeted every year beginning in 2026 to maintain the mulch at a two to three-inch thickness. This mulch can be wood chips from City tree care operations (free) or shredded hardwood mulch (will stay in place better, last longer and look nicer, but must be purchased).

Educating homeowners on the importance of installing mulch rings is vital. Numerous instances were observed when conducting the street tree portion of the inventory field work where basal damage had occurred as the result of mower or string trimmer damage.

ix. Watch (see Table 4)

There is also a projected budget amount that includes watch trees as identified in the inventory. The inspection of these 865 trees are distributed relatively evenly throughout each budgeted year, they are all conifers. They rarely require any maintenance; however, they need to be checked periodically for sight clearance issues where they are planted in the street terrace and general overall health and vigor.

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

x. Girdling Roots (see Table 4)

Girdling roots is a situation where a root(s) grows around the base of the tree cutting off the flow of materials through the cambium up into the tree. This will slowly kill the tree over several years. It is a very common problem with Norway Maples and the reason why planting Norway Maples is discouraged. Given that there are 212 Norway Maples (6.12% of population) this will most likely stay a limited problem over time. Instead of the trees living eighty plus years, they may only live thirty to forty years. Girdling roots are discovered and correct during a root collar exam utilizes an air spade. This procedure exposes roots in the root crown area and the problem roots can be cut away to correct the problem. However, it is not possible to see all problem roots because they are below the surface. These types of maintenance could reduce the removal and planting costs of leaving a tree with girdling roots. Better species selection for new plantings is the long-term answer.

E. Disease & Insect Problems

i. Dutch Elm Disease

There are 139 Elm Spp. (4.01%) in the entire inventory for the City. This includes a variety of hybrid species that are less susceptible to DED. Regular inspections are still necessary, and removal of infected elm trees should be programmed into the maintenance schedule to help break the disease cycle and to keep dead or dying trees from endangering the public.

The City has planted several varieties of disease resistant hybrid elms. This is a great way to keep the *Ulmus* genus part of the species diversity mix. The low planting rate of these trees provides an opportunity for greater tree diversity in the City's urban forest. A note of caution, these young hybrid trees grow fast. Without regular structural pruning (every 2-3 years for a period of 15 years), these tree can develop poor form and become a hazard. Remember, there is no "set it and forget it" solution with newly planted trees!

ii. Oak Wilt

There was no active oak wilt detected in either the street or park inventoried areas. Oak wilt is a fungal disease that invades the water conducting vessels of the sapwood and causes blockage of these vessels. This disrupts sap flow, causing leaves to wilt and eventual death of the tree. The Red Oak group is more susceptible to the disease than White, Swamp White or Bur Oak. The breakdown of oak species inventoried includes: 74 Northern Red Oak, 42 Swamp White Oak, 71 Bur Oak, and 60 White Oak trees. The Oak family accounts for ~7.13% (247 trees) of all the public trees that were inventoried in the City. Planting more *Quercus* tree species is another opportunity for increasing tree diversity in the City.

Understanding of oak wilt management is critical to properly managing this disease. An excellent publication giving an overview of this disease and its management has been produced by the University of Wisconsin-Extension titled “*Oak Wilt Management – What are the Options*” (publication #G3590).

iii. Spongy Moth

There has been no organized aerial spraying in the City of Pewaukee for the spongy moth suppression program in recent years. It should be noted that increasing spongy moth populations were noted in 2022 across southern Wisconsin. Additional monitoring efforts are recommended in 2023.

iv. Emerald Ash Borer

The EAB is an exotic wood borer that was found attacking and killing ash trees in Michigan during 2002. Since its detection, EAB has killed millions of ash trees and is now found across the eastern United States, west to Colorado, south to Texas, and north into Canada. EAB is easily spread through the movement of firewood, logs and nursery stock and is why people have been the greatest cause for the rapid spread of EAB over the past decade.

EAB is a very destructive pest. This insect attacks and kills white, green, blue, black and all horticultural varieties of ash. This insect attacks not only stressed ash trees but healthy and vigorous ash trees as well. The larvae of this insect feed under the bark undetected, disrupting the flow of nutrients and water between the roots and crown of ash trees. The first visible signs are usually crown dieback. By this time it is usually too late to save trees.

This pest has been confirmed and is well established across southern and eastern Wisconsin, and is spreading into northern Wisconsin. The City is currently selectively treating priority ash trees across South, Balmer, and Nettesheim Parks. The remaining public ash trees will need to be removed.

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

Additionally, listed below are three websites with current information on EAB:

1. <http://emeraldashborer.wi.gov/>
 - a. EAB internet portal for Wisconsin sponsored by Wisconsin Department of Agriculture, Trade and Consumer Protection, the Wisconsin Department of Natural Resources and the University of Wisconsin – Madison
 - b. Contains information from a Wisconsin perspective on EAB biology, management, survey activities, publications and provides related links
2. <http://www.emeraldashborer.info/>
 - a. Official emerald ash borer web page administered by Michigan State University
 - b. Contains information on EAB biology, distribution, control measures, current research and links to various EAB infested state's web sites
3. <http://dnr.wi.gov/topic/UrbanForests/EABToolBox.html>
 - a. Wisconsin DNR EAB Toolbox for Wisconsin Communities
 - b. Designed for the planning and response needs of municipal governments, including such topics as: "Is Your Community Ready for EAB (video)", "EAB: The Opportunity of a Lifetime", "Readiness Checklist", "What Will Happen if EAB is Found in Your Community?" and "EAB University"

v. Asian Long Horned beetle

The Asian Longhorned Beetle (*Anoplophora glabripennis*, ALB) is a destructive pest that threatens to cause more damage than gypsy moth, the emerald ash borer, and Dutch Elm Disease combined. This is due to the indiscriminate nature of ALB when choosing host trees to feed and lay eggs on. The ALB is known to affect multiple favorable tree species including maple, elm, birch, horse chestnuts, poplar, and willows. These species are in addition to some of the tree species that are becoming popular as municipal tree plantings such as London planetree and Katsura. ALB has currently established in New York, Massachusetts, and Ohio.

Approximately 1/5 of the City's public tree population is comprised of maples. The City has a lot to lose if ALB becomes established and should actively monitor for trees displaying signs/symptoms of ALB infestation. Images of the beetle and signs left behind, as well as additional information can be found online at:

<https://www.aphis.usda.gov/aphis/resources/pests-diseases/asian-longhorned-beetle>

vi. Other Pest Problems (by tree species):

Honeylocust

Leafhoppers and plant bugs (leaf sucking insects that defoliates the tree)

- Relatively easy to control, but the public is often not comfortable with spraying. Can be controlled with a soil injected material for individual high value trees (like park trees or business district area).

Nectria canker

- A fungus that causes a dead area in the bark, usually at a branch crotch area. Important to keep the tree growing vigorously and out of drought stress. Proper pruning cuts and dormant pruning during dry, lower humidity conditions are important.

Linden

Boring insects

- Can be very serious on individual trees. Usually attack branch crotch areas. Buying good planting stock and good training pruning can do a lot to limit this problem. Keeping existing plants healthy and out of stress is very important. Can trunk inject specimen trees, but is expensive.

Spruce

Spruce needle casts (Rhizosphaera)

- Rows of black dots (fruiting bodies) on needles. Loss of innermost needles. Shade and irrigation compound the problem.

Cytospora canker

- Dieback and eventual death of lower branches. Disease progresses upward in tree over time. Prune out infected branches during dry conditions. Mulching, supplemental watering and fertilization reduce disease incidence.

Crabapple

Apple scab

- A fungus causing leaf spots, which causes premature leaf drop, and disfigured fruits. Can be treated with two to three foliar sprays annually. Plant disease-resistant varieties.

F. Crew Training

Some general fund money should continue to be included each year for continued forestry training. Serious consideration should be given to have one ISA Certified Arborist on staff and to hold at least one membership with the Wisconsin Arborist Association. Attending the various meetings produced by the WAA and/or the DNR's Urban Forestry working group can provide additional avenues to secure technical training. A goal should be to have at least one International Society of Arboriculture *Certified Arborist* on staff.

KEY NEEDS OF THE URBAN FOREST

The main needs of the City of Pewaukee' urban forest, as brought out in the inventory and discussions, fall into three categories:

Administrative Needs:

- implementation of the Management Plan
- recommendations for additions and reorganization to the Municipal Tree Ordinance
- supplemental training of crews
- all City departments understand importance of trees
- revenue generating opportunities

Resource Needs:

- street tree removals
- safety and clearance pruning
- training pruning
- proper species selection to improve diversity
- improve tree condition/health through timely watering and mulching practices
- proper regular maintenance

Community Needs:

- public awareness on policies of trees in the ROW and other public property
- education, especially major disease and insect threats
- involvement of civic groups in funding projects, particularly tree planting

VII. REVIEW OF PLAN

It is vital to the success of the urban forestry program that this Plan be evaluated to see that desired results are being attained. It must be remembered that a Management Plan is a dynamic document. There will certainly be a need to change or add goals, strategies and priorities as time goes on. It will be the responsibility of the appropriate City departments to review all of the goals, strategies, actions, tasks, and priorities in the Plan in the summer of every year, prior to budget submission, to see that they are achieving the overall Mission and Purpose. Any additions and/or adjustments to the Plan will be made at the time of the review. The City Board should be informed of these accomplishments. A major review and update should take place in **2027** by an outside urban forestry consulting firm.

**Public Tree Inventory Report & Management Plan
For the City of Pewaukee, WI
By Wachtel Tree Science (262)538-1900
October 2022**

VIII. CONCLUSION

It has been the pleasure of Wachtel Tree Science to assess the data and policies that comprise Pewaukee's Urban Forest. The City of Pewaukee has a unique opportunity to realize the value that currently exists within its' public forest and make the necessary changes to tackle management needs head on. With some additional focused management strategies, the City will be able to improve the overall health and structure of the urban forest, laying the foundation of beautiful trees for years to come.

The City of Pewaukee has a wonderful living, growing resource. The urban forest needs to be managed to avoid serious problems and to achieve its full potential. When managed properly, it will increase in value, giving many benefits to the citizens from cleaner air, cooler homes, increased property values and making the City of Pewaukee a more beautiful community to visit, work and live in.

APPENDICES

Appendix A: Inventory Criteria

Pewaukee Tree Inventory – ESRI Field Maps

GENERAL NOTES:

Inventory all trees in the Right-Of-Way (R.O.W.), selected parks and public properties that are 1.0” diameter at breast height (DBH, 4.5 feet above ground) or greater.

- Data fields not applicable to the site being inventoried do not have to be edited

Page 1

Inspection Date - use check box to automatically select the current date or drop down menu to select required date from a calendar

Species - select the species group (common, uncommon or rare) that contains the site description or tree species to being inventoried > select the site description or species from the second drop down menu

- DO NOT use varieties designated for Green Ash, White Ash, Norway Maple or Honeylocust
- Oddball Linden (Boulevard, Sentry, etc.) are Basswood Spp.
- For Norway Maple and other species with purple leaves, write ‘purple leaved’ in NOTES, these trees have slightly different growth characteristics
- For species with variegated leaves, write ‘variegated’ in NOTES, these trees have slightly different growth characteristics
- See sections on VACANT PLANTING SITES or STUMPS for more information how to fill out those site types

COMMON	UNCOMMON	RARE
Vacant	Ailanthus	American Hornbeam
Stump	American Mountain-Ash	Amur Corktree
Alder Spp.	Amur Chokecherry	Balsam Poplar
American Basswood	Amur Maple	Bigtooth Aspen
American Elm	Apple Spp.	Bitternut Hickory
Ash Spp.	Baldcypress	Black Ash
Austrian Pine	Balsam Fir	Black Maple
Birch Spp.	Basswood Spp.	Black Oak
Black Cherry	Black Hills Spruce	Black Spruce
Black Locust	Cockspur Hawthorn	Black Willow
Black Walnut	Cornelian Cherry Dogwood	Blackgum
Boxelder	Dogwood Spp.	Blue Ash
Bur Oak	Douglas-Fir	Bristlecone Pine
Callery Pear Spp.	Eastern Cottonwood	Butternut

Cherry and Plum	Eastern Hemlock	Canada Plum
Colorado Spruce	Eastern Redcedar	Catalpa Spp.
Crab Apple Spp.	Eastern White Pine	Chestnut Oak
Crab Apple Var.	European Alder	Chestnut Spp.
Elm Spp. (Hybrid)	European Hornbeam	Chinese Elm
Freeman Maple	European Larch	Chinkapin Oak
Green Ash	European Mountain-Ash	Common Hoptree
Green Ash Var.	Fir Spp.	Common Persimmon
Hackberry	Ginkgo	Crack Willow
Hawthorn Spp.	Glossy Buckthorn	Cucumbertree
Honeylocust (Thornless)	Honeylocust (Native)	Dawn Redwood
Honeylocust Var.	Hornbeam Spp.	Downy Hawthorn
Horsechestnut	Jack Pine	Eastern Redbud
Ironwood	Juniper Spp.	European Ash
Japanese Tree Lilac	Kentucky Coffeetree	European Beech
Littleleaf Linden	Larch (Introduced)	False Cypress Spp.
Mountain-Ash Spp.	Lilac Spp.	Fraser Fir
Northern Red Oak	Lombardy Poplar	Golden Raintree
Norway Maple	Magnolia Spp.	Japanese Larch
Norway Maple Var.	Maple Spp.	Katsura Tree
Oak Spp.	Northern Catalpa	Korean Mountain-Ash
Other, Unknown	Northern Pin Oak	Mockernut Hickory
Paper Birch	Northern White-Cedar	Ohio Buckeye
Pine Spp.	Norway Spruce	Pagoda Dogwood
Poplar Spp.	Osage-Orange	Pear Spp.
Red Maple	Pin Oak	Pecan
Redmond Linden	Red Elm	Pignut Hickory
Russian-Olive	River Birch	Pin Cherry
Scotch Pine	Rock Elm	Ponderosa Pine
Siberian Elm	Sargent Cherry	Port-Orford-Cedar
Silver Maple	Serviceberry	Quaking Aspen
Spruce Spp.	Shagbark Hickory	Red Mulberry
Sugar Maple	Shubert Cherry	Red Pine
White Ash	Silver Linden	Sassafras
White Ash Var.	Swamp White Oak	Saucer Magnolia
Willow	Sweetgum	Scarlet Oak
	Sycamore	Shingle Oak
	Tamarack (Native)	Silverbell
	Turkish Filbert	Smoketree

	Walnut Spp.	Sourwood
	Washington Hawthorn	Southern Catalpa
	Weeping Willow	Tartian Maple
	White Fir	White Mulberry
	White Oak	White Poplar
	White Spruce	White Willow
	Yew Spp.	Wild Plum
		Yellow Birch
		Yellow BUCKeye
		Yellow-Poplar
		Yellowwood

Address - N/A (automatically filled post process by Ruekert-Mielke)

Street - N/A (automatically filled post process by Ruekert-Mielke)

Side Street - N/A

- Only collect data for communities when requested
- For corner properties with trees located on the adjacent side street, fill Side Street with the name of the adjacent side street.
- Also fill in Side information

Side

- N/A
- Front
- Right
- Left
- Back
- Median

Location

- Street
- Park
- Parking Lot
- Building Site
- Natural Area
 - Under Special Conditions check wooded area - WA
 - Only inventory trees that are 8 inches DBH or greater
- Other

Year Planted - N/A.

Growth Space

- Open
- 0 - 3 ft - distance between street and sidewalk
- 3 - 5 ft - distance between street and sidewalk
- 5 ft + - distance between street and sidewalk
- Ditch - drainage ditch
- Median - strip of land between lanes of opposing traffic
- Island - strip of land between traffic lanes used for control of traffic movement

- Boxout - space located within downtown sidewalks designated for tree
- Grate - boxout with grate surrounding tree
- Behind Walk - site located behind sidewalk, rather than between the street/curb and sidewalk (usually the R.O.W. ends at the sidewalk, occasionally it can extend beyond the sidewalk and trees may be planted there)
- Other
-

Diameter -

- Measure DBH in inches
 - Round up for trees over the 0.5 inch mark and round down for trees below the 0.5 inch mark
 - For ash trees round up for trees over the 0.3 inch mark
- For multi-stemmed trees measure the largest stem DBH
 - Under NOTES designate the number of stems, ex. '2-stemmed', '3-stemmed', 'clump' (stems less than 2 inches DBH), etc. and the DBH of all the individual stems above 2 inches in diameter
 - For multiple stem trees where stems originate from ground level, under Special Conditions check multi-stemmed - MS and possibly codominant trunks/stems - CT or included bark - IB (stems might have fused together)
 - For single stem tree with codominant stems below 6', measure/record DBH of single stem, under Special Conditions check low crotched - LC and possibly codominant trunks/stems - CT, included bark - IB or poor structure - PS

Height Class

- N/A
- 0-15'
- 15-30'
- 30-60'
- 60'+

Deadwood Present (%) - estimated the percent of deadwood in the crown, range of 0-100% with 5% increments

- For trees with 15% and greater deadwood normally 2 inches in diameter and greater check deadwood - DW under Special Conditions and 'safety prune' under Needs Priority

Condition Rating (%) - range of 0-100% with 5% increments

- No tree should have a 100% rating for liability purposes

Planting Depth

- N/A
- OK
- Deep, Vigor Good
- Deep, Declining
- For both 'Deep' planting depths, under Special Conditions mark deep planting - DP

Primary Maintenance Needs - list most pressing maintenance need

- Hierarchy: removal, safety, structure, health
- Plant - vacant site suitable for planting
 - Work Priority should be OK by default
- Remove - tree requires removal
 - Tree usually has Condition Rating between 0 and 45%, may be adjusted based on pest problems, etc.
 - Work Priority should occur 'Within One Year' and 'Within Three Years', depends on severity
- Safety Prune - tree require immediate pruning to remove potential hazards,
 - Trees usually has Condition Rating between 50 and 65%, might not apply to clearance pruning
 - For trees with 15% and greater deadwood normally 2 inches in diameter and greater, under Special Conditions check deadwood - DW
 - Trees with hangers - HG require a 'safety prune'
 - Trees that require clearance should be marked low branched - LB in Special Conditions and require a safety prune
 - Work Priority should occur 'Within One Year'
- Routine Prune - normal maintenance for trees with no immediate hazards
 - Trees usually has Condition Rating 65% and above
 - For trees 7 inches and greater DBH
 - Work Priority should occur 'Within Five Years'
- Training Prune - pruning for small trees to encourage good structure
 - Trees usually has Condition Rating 65% and above
 - For trees 6 inches and less DBH
 - Work Priority should occur 'Within Three Years'
- Watch - regularly inspect trees that are not actively managed (pruning, etc.), but still fall within the R.O.W. and inventoried properties
 - All evergreen species are NOT actively managed, Work Priority should occur 'Within Five Years'
 - Trees that 6 inches or less that are establishing poorly
 - We don't want to continue to stress the tree with training pruning
 - Primary Maintenance Needs should be 'Watch' with Work Priority should occur 'Within Three Years'
- Cable & Prune - not applicable to all communities
 - Work Priority should occur 'Within Three Years'
- Girdling Root -
 - Pay attention to Norway Maples
 - Usually Secondary Maintenance Need
 - Under Special Conditions mark deep planting - DP
 - Work Priority should occur 'Within Five Years'
- Remove Stump
 - Work Priority should occur 'Within One Year'
- Remove Stakes - new planting occasionally require stakes to stabilize the tree as it gets established

- Trees should not be staked for more than one year after planting, otherwise the tree might become dependent on the stakes
 - Work Priority should occur 'Within One Year'
- Tree Heaving walk/curb - sidewalk or curb next to tree heaving creating uneven separation that affects the safe use of the sidewalk or uplifting 2 inches and greater
 - Where sidewalk is purposely altered to go around a root flare, list 'sidewalk radius' under NOTES
 - Work Priority should occur 'Within One Year'
 - If the tree is marked for 'Removal' heaving sidewalks don't have to be noted
- Treat

Secondary Maintenance Needs - list second most pressing maintenance need for tree

- N/A
- Routine Prune
- Training Prune
- Watch
- Cable & Prune
- Girdling Root
- Remove Stakes
- Tree Heaving walk/curb
- For trees that require treatment and a safety prune mark 'Treat' in Primary Maintenance Needs and 'safety prune' in Notes

Work Priority

- OK
- Within One Year
- Within Two Years
- Within Three Years
- Within Four Years
- Within Five Years

Clearance

- Trees that require clearance should be marked low branched - LB in Special Conditions and require a safety prune
- OK
- Traffic - tree branches hang below 14 feet over street
 - These branches typically have damage from passing trucks
- Signs/Lights - where trees are in direct conflict (touching or obstructing the view)
 - Under NOTES list 'street light' or 'stop sign', these types of signs have priority for safety pruning
- Walk - tree branches hang below 8 feet over sidewalk
- Potential View Obstruction

Utility

- For trees that have been utility pruning in the past, mark utility pruned - UP in Special Conditions
 - Condition ratings will normally be 70% or less
- None
- Electric - 10 ft clearance
- Telephone/Cable - 10 ft clearance

- Both
- Underground - 5 ft clearance
- DO NOT include service drops

Notes

- Make note of ‘old storm damage’, ‘upright/columnar’ forms, ‘multi-stemmed’ trees, ‘purple’ or ‘variegated’ varieties, ‘street lights’, ‘stop signs’ or pest problems

Special Conditions - ways to note atypical/abnormal growth patterns/problems based on a street tree species

Abbreviation	Special Condition	Description
BS	Basal Suckers	suckers growing around base of trunk, any number
BW	Basal Wound	visible/open wound at ground level, actively sealing
CC	Concreted Cavity	concrete in tree
C/D	Cavity/Decay	visible/open cavity
CD	Crown Dieback	deadwood present at the tips of the canopy, crown retreating
CR	Consider Removal	condition rating between 50 and 55%
CT	Codominant Trunks/Stems	no central leader
DFP	Decay Fungi Present	fruiting bodies of decay
DL	Dead Leader	dead codominant stem still present in the tree
DP	Deep Planting	deep planting
DW	Deadwood (15%, 2"+)	trees with 15% and greater deadwood normally 2 inches in diameter
HG	Hanger	hanger
IA	Invasives Around	unintended sprouts (buckthorn, ect.) conflicting with growth space, found in WA and or around conifers
IB	Included Bark	included bark
IM	Improperly Mulched	excessive mulch against trunk of tree
IP	Improperly Pruned	stubs, flush cuts, tears, etc.
LB	Low Branched	branches that impede safe use of area around tree (streets, sidewalks, mower clearance etc.)
LC	Low Crotched	single stem tree with codominant stems below 6', measure/record DBH of single stem
LLD	Large Leader Decay	significant dieback on one significant limb/leader
LML	Lost Main Limb/Leader	stump/wound from damaged large main limb/leader ripped/broken out of tree, usually during a storm event
LN	Leaning	significant abnormal growth pattern, tree may potentially fail
LS	Lightning Struck	lightning struck

MD	Mechanical Damage	trunk wound from mechanical damage (mower damage, struck by cars, construction damage, etc.), BW and/or TW
MS	Multi-stemmed	stems originate from ground level
ND	Nutrient Deficiency	mostly chlorosis
OG	Overgrowing Growthspace	usually large tree in narrow terrace, roots over growing sidewalk/curb
OS	Overshadowed	street trees where private tree dominates public tree's canopy
PL	Poor Location	poor location
PP	Pest Problem	list pest problem under NOTES (apple scab, target canker, etc.)
PS	Poor Structure	IB, LC, significant CT
RD	Root Damage	visible root damage and assumed damage from new construction
RP	Raised Planter	raised planter
RR	Root Rot	visible root decay or fruiting bodies
SP	Sucker Present	canopy water sprouts/suckers, note when vigorous for species
TP	Topped	topped
TS	Trunk Split	unsealed wound/split in trunk, usually remove Within One Year, call client contact to notify
TW	Trunk Wound	visible/open wound on trunk, actively sealing, don't have to include typical frost cracks (for species such as Norway Maples)
UP	Utility Pruned	tree was pruned for utility clearance
WA	Wooded Area	should already be noted in tree location
WG	Weak Growth	recent growth is less than expected for species profile

VACANT PLANTING SITES

Locate vacant planting sites within the following parameters:

terrace width of 5 feet (1.5 meters) or greater that have curb, sidewalk and grass.

- Street tree Growth Spaces with terrace widths that are open, greater than 5 feet, boxout/grate or behind walk that have a curb, sidewalk and grass
- In medians and Growth Spaces not listed above only inventory existing trees, no vacant planting sites will be located
- Vacant planting sites must be spaced 40 feet (12.2 meters) on center
- No overhead restrictions
- Minimum of 5 feet (1.5 meters) from water/gas laterals
- Minimum of 10 feet (3.0 meters) from driveways
- Minimum of 10 feet (3.0 meters) from utility poles
- Minimum of 10 feet (3.0 meters) from hydrants
- Minimum of 10 feet (3.0 meters) from other miscellaneous obstacles (signage, flag poles, fencing etc.)
- Minimum of 50 feet (15.2 meters) from intersections (watch vision triangles!!)

- In the event of an inventory update, if an existing yard or private tree conflicts with a potential planting site, show as a “no plant site” and list reason in Notes
- For vacant planting sites, include the following information:
 - Inspection Date
 - Species - Common, Vacant
 - Location - Street
 - Growth Space - Open, 5 ft +, Boxout, Grate, Behind Walk
 - Primary Maintenance Needs - Plant
 - Work Priority - OK
 - Work Priority managed separately/differently from other maintenance needs

STUMPS

Inventory all stumps in the Right-Of-Way (R.O.W.), selected parks and public properties.

- For stumps, include the following information:
 - Inspection Date
 - Species - Common, Stump
 - Location -
 - Growth Space - Open, 5 ft +, Boxout, Grate, Behind Walk
 - Diameter - diameter of the stump
 - Primary Maintenance Needs - Remove Stump
 - Work Priority - Within One Year
 - Include other information as needed to identify whether or not it would make a suitable planting site

Appendix B: Tree Species Recommendations

RECOMMENDED TREE PLANTING LIST

This list is provided as a guide to some of the most appropriate trees for urban settings in USDA Hardiness Zone 5b for the City of Pewaukee. There is no single perfect tree. These species have been selected for use in our demanding street tree situations. There is a larger group of plants that would grow very well in the City of Pewaukee and should be considered for other landscape uses (parks, etc.). Before selecting any particular species or variety, each site should be evaluated as to: rooting space, soil texture, soil pH, drainage, exposure, overhead wires, and surrounding buildings (crown space). The most important thing to remember is to plant the right tree in the right place.

SMALL TREES (Below 30' Maximum Height) – Acceptable trees for terraces with overhead power lines and/or if terrace is 3-5 feet wide. May be planted in wider terraces.

Scientific Name	Common Name	Cultivars
<i>Amelanchier arborea</i>	Downy Serviceberry	
<i>Amelanchier x grandiflora</i>	Apple Serviceberry	Autumn Brilliance', 'Robin Hill'
<i>Amelanchier laevis</i>	Allegheny Serviceberry	'Cumulus', 'Lustre'
<i>Carpinus caroliniana</i>	American Hornbeam	'Firespire'
<i>Crataegus crusgalli inermis</i>	Thornless Cockspur Hawthorn	
<i>Crataegus phaenopyrum</i>	Washington Hawthorn	
<i>Crataegus viridis</i>	Winter King Hawthorn	'Winter King'
<i>Maackia amurensis</i>	Amur Maackia	'Starburst'
<i>Malus spp.</i>	Flowering Crabapple	'Adirondack', 'Bob White', 'Harvest Gold', 'Jackii', 'Prairiefire', 'Professor Sprenger', 'Red Bud', 'Royal Raindrops', 'Sugar Tyme'
<i>Ostrya virginiana</i>	Ironwood	
<i>Syringa pekinensis</i>	Peking Lilac	China Snow'
<i>Syringa reticulata</i>	Japanese Tree Lilac	Ivory Silk', 'Summer Snow'

MEDIUM TREES (30’-45’ Maximum Height) – Acceptable trees for terraces that are 5-8 feet wide. May be planted in wider terraces.

Scientific Name	Common Name	Cultivars
<i>Aesculus carnea</i>	Red Horsechestnut	‘Ft. McNair’
<i>Aesculus glabra</i>	Ohio Buckeye	‘Sunset’
<i>Cladrastis kentuckea</i>	American Yellowwood	
<i>Sorbus alnifolia</i>	Korean Mountain Ash	

LARGE TREES (Above 45’ Maximum Height) – Acceptable trees for terraces 8 foot and wider.

Scientific Name	Common Name	Cultivars
<i>Aesculus octandra</i>	Yellow Buckeye	
<i>Carya cordiformis</i>	Bitternut Hickory	
<i>Celtis occidentalis</i>	Hackberry	Prairie Pride', ‘Chicagoland’
<i>Cercidiphyllum japonicum</i>	Katsuratree	
<i>Corylus colurna</i>	Turkish Filbert	Autumn Gold'
<i>Eucommia ulmoides</i>	Hardy Rubber Tree	
<i>Ginkgo biloba</i>	Ginkgo (male only)	Autumn Gold', 'Magyar', 'Princeton Sentry'
<i>Gleditsia triacanthos inermis</i>	Thornless Honeylocust	Imperial', 'Shademaster', 'Skyline/Skycole', 'Sunburst', 'Street Keeper/Draves'
<i>Gymnocladus dioica</i>	Kentucky Coffeetree	Espresso', 'Prairie Titan'
<i>Liriodendron tulipifera</i>	Tuliptree	
<i>Platanus x acerifolia</i>	London Planetree	‘Exclamation’
<i>Quercus bicolor</i>	Swamp White Oak	
<i>Quercus macrocarpa</i>	Bur Oak	
<i>Quercus robur</i>	English Oak	Skymaster', 'Regal Prince'
<i>Quercus rubra</i>	Red Oak	
<i>Quercus muehlenbergii</i>	Chinkapin Oak	
<i>Quercus x schuettei</i>	Swamp x Bur Oak	
<i>Taxodium distichum</i>	Baldcypress	‘Shawnee Brave’
<i>Ulmus x</i>	Hybrid Elm	Accolade', 'New Horizon', 'Regal', ‘Triumph’
<i>Ulmus parvifolia</i>	Lacebark Elm	

EVERGREENS TREES – Do not plant on streets, evergreens obstruct visibility making them hazardous on street locations. Acceptable trees for parks and non-street tree locations.

Scientific Name	Common Name	Cultivars
<i>Abies concolor</i>	White Fir	
<i>Xanthocyparis nootkatensis</i>	Nootka Cypress	
<i>Juniperus chinensis</i>	Chinese Juniper	Iowa', 'Mounntbatten'
<i>Juniperus x</i>	Star Power Juniper	JN Select Blue'
<i>Picea glauca var. densata</i>	Black Hills Spruce	
<i>Picea omorika</i>	Serbian Spruce	
<i>Pinus bungeana</i>	Lacebark Pine	
<i>Pinus flexilis</i>	Limber Pine	Vanderwolf's Pyramid'
<i>Pinus strobus</i>	Eastern White Pine	Fastigiata'
<i>Pinus sylvestris</i>	Scotch Pine	
<i>Pseudotsuga menziesii</i>	Douglasfir	
<i>Thuja occidentalis</i>	Arborvitae	Smaragd', 'Hetz Wintergreen', 'Sunkist', 'Techny'
<i>Thuja plicata</i>	Western White Cedar	
<i>Tsuga canadensis</i>	Canadian Hemlock	

UNACCEPTABLE TREE PLANTING LIST

The following is a list of trees that are considered unacceptable for planting in the road right of way. Species on this list may be planted in park or open space settings in the right location and situation. This list should be evaluated periodically and species may be added or removed as seen fit.

Scientific Name	Common Name	Reason
<i>Acer negundo</i>	Boxelder	Weak wooded, attracts boxelder bug
<i>Acer platanoides</i>	Norway Maple	Over-planted, invasive, girdling roots
<i>Acer rubrum</i>	Red Maple	Intolerant of alkaline soils
<i>Acer saccharinum</i>	Silver Maple	Weak wooded, aggressive roots, heavy seed crop
<i>Ailanthus altissima</i>	Tree-of-Heaven	Weak wooded
<i>Elaeagnus angustifolia</i>	Russian Olive	Disease problems, weak wood
<i>Fraxinus spp.</i>	Ash	Emerald Ash Borer
<i>Ginkgo biloba</i> (female)	Ginkgo (female)	Messy and smelly fruit

<i>Juglans spp.</i>	Walnut	Littering fruit
<i>Malus sylvestris</i>	Common Apple	Fruit tree
<i>Morus spp.</i>	Mulberry	Littering fruit
<i>Populus spp.</i>	Poplar, Cottonwood	Weak wooded, aggressive roots, heavy seed crop
<i>Prunus serotina</i>	Black Cherry	Fruit tree
<i>Prunus domestica</i>	Garden Plum	Fruit tree
<i>Pyrus calleryana</i>	Callery Pear	Exhibits invasive traits
<i>Pyrus communis</i>	Common Pear	Fruit tree
<i>Quercus palustris</i>	Pin Oak	Intolerant of alkaline soils
<i>Robinia pseudoacacia</i>	Black Locust	Weak wooded, thorns, invasive
<i>Salix spp.</i>	Willow	Weak wooded, aggressive roots
<i>Sorbus americana</i>	American Mountainash	Susceptible to insects and disease
<i>Sorbus aucuparia</i>	European Mountainash	Susceptible to insects and disease
<i>Ulmus pumila</i>	Siberian Elm	Weak wooded, aggressive roots

Appendix C: Definitions

American National Standards Institute (ANSI)	Non-profit organization that develops national consensus standards for various industries.
ANSI A3100 Standards	Industry-developed, national consensus standards of practice for tree care.
ANSI Z133.1 Standards	Industry-developed, national consensus safety standards of practice for tree care.
Arborist	Professional who possesses the technical competence gained through experience and related training to provide for or supervise the management of trees and other woody plants in residential, commercial, and public landscapes.
Best Management Practices (BMP)	Best-available, industry-recognized courses of action, in consideration of the benefits and limitations, based on scientific research and current knowledge.
Canopy	Collective branches and foliage of a tree or group of trees.
Superintendent Public Works	Individual in charge of enforcing the provisions of these specifications
Chlorosis	A whitish or yellowish leaf discoloration caused by a lack of chlorophyll, often caused by nutrient deficiency.
Co-dominant Branches or Co-dominant Stems	Forked branches nearly the same size in diameter, arising from a common junction and lacking normal branch union.
Construction Damage	Damage to a tree (branches, trunk or roots) usually from excavating, filling, grade changes, compaction, etc. It can take up to five years for visible signs of this damage to show up in a tree and ten years for a tree to die.
Crown	Upper part of a tree, measured from the lowest branch, including all the branches and foliage.
Crown Cleaning	Removing dead, dying, diseased, and/or broken branches from the tree crown.
Crown Rot	Disease or other decay at the base of a tree or root crown.
Cultivar	Cultivated variety of a plant; cannot be reproduced without human assistance; usually propagated asexually (cloned); compare to variety.
Deadwooding	Removing dead and dying branches from a tree.
Diameter-at-Breast-Height (DBH)	A standard measure of tree trunk size measured at 4.5' above ground level, on the uphill side.
Dieback	Condition in which the branches in the tree crown die from the tips toward the center.

Directional Pruning	A pruning technique that is used to "train" trees to grow in a certain direction (usually away from utility lines or buildings). The most important aspect involves always pruning back to a lateral branch to try and reestablish a leader in that area of the tree.
Flagging	Symptom in which leaves on a branch wilt and may ultimately turn brown without falling from the shoot.
Genus	Taxonomic group of species having similar fundamental traits: botanical classification under the family level and above the species level.
Girdling Roots	Roots located above or below ground whose circular growth around the base of the trunk or over individual roots applies pressure to the bark area, ultimately restricting sap flow and trunk/root growth, frequently resulting in reduced vitality and/or death of the plant.
Hanger	Broken or cut branch that is hanging in a tree.
Hardiness	Genetically determined ability of a plant to survive low temperatures.
Hazard Tree	Any tree or tree part that has a major structural fault that could lead to catastrophic loss and it has an identifiable target (people or property).
Included Bark	Bark that becomes embedded in a crotch (union) between branch and trunk or between codominant stems; causes a weak union.
ISA Certified Arborist	An individual who is trained in the art and science of planting, caring for and maintaining individual trees. And one who has passed the certification examination sponsored by the International Society of Arboriculture and who maintains a current certification.
Leader	Primary terminal shoot or trunk of a tree; large, usually upright stem; a stem that dominates a portion of the crown by suppressing lateral branches.
Live Crown Ratio	Ratio of the height of the crown containing live foliage to the overall height of the tree.
Mature Height	Maximum height that a plant is likely to reach if the conditions of the planting site are favorable.
Pruning Cycle	In municipal arboriculture, the length of time between each maintenance (routine) pruning for a given geographic area.
Qualified Arborist	A worker who, through related training and on-the-job experience, is familiar with the hazards of pruning, trimming, repairing, maintaining, or removing trees, and with the equipment used in such operations, and has demonstrated his/her ability in the performance of the special techniques involved.
Raising or Lifting	Selective removal of lower limbs from a tree to provide clearance.
Root Crown or Collar	Area where the main roots join the plant stem, usually flared at the tree trunk base.
Routine Pruning	Pruning done on a regular basis (usually every five to seven years) that is done mostly for sanitation, therapeutic or maintenance reasons to keep

	trees healthy. Usually involves a combination of crown cleaning, raising and training pruning.
Safety Pruning	Pruning to remove a potential hazard such as large deadwood, broken branches, or branches impeding traffic or pedestrian travel. This type of pruning also includes branches obstructing street signs and light or obstructing vision at intersections and drive approaches.
Significant Trees	Trees that provide significant aesthetic and environmental benefits such as reduction of storm water runoff, preservation of wildlife habitat, enhancement of air quality, and contributes to overall forest health by providing species and size class diversity.
Species	Taxonomic group of organisms composed of individuals of the same genus that can reproduce among themselves and have similar offspring.
Speciman Tree(s) or Stand	Any tree or group of trees which has been determined to be of high value because of its species, size, age, historic significance or other criteria as designated by the City of Pewaukee.
Structural Defects	Any naturally occurring or secondary conditions such as cavities, poor branch attachments, cracks, or decayed wood in the trunk, crown, or roots of a tree that may contribute to structural failure.
Training Pruning	Pruning done to young trees (or sometimes neglected older trees) to establish proper branching structure, critical for long term health and safety of trees. Best if performed on a two to four year cycle.
Tree Protection Zone (TPZ)	A fenced area around a tree or group of trees that will not be disturbed by construction activities.
Trunk Formula Method	Method to appraise the monetary value of trees considered too large to be replaced with nursery or field-grown stock, or a method to produce a fairly accurate monetary value of a large grouping of public trees.
Watch Tree	These are trees that need to be checked yearly due to problems such as poor structure or decay. These are marginal trees that are not bad enough to make the safety prune or removal list, but due to their condition, they may need work in the next few years. They have a higher potential for problems and should be checked regularly due to this.
Utility Prune	Pruning around or near utility facilities with the objective of maintaining safe and reliable utility service.
Variety	Naturally occurring subdivision of a species having a distinct difference and breeding true to that difference; compare to cultivar.

Appendix D: References and Resources

HAZARD TREES

Council of Tree and Landscape Appraisers, 2000. "Guide for Plant Appraisal (9th ed.)" Inter. Soc. of Arboriculture, Champaign, IL, 143 pp.

Hayes, Ed, 2001. "Evaluating Tree Defects, A Field Guide (2nd ed.)", 58 color photos and 43 illustrations, Inter. Soc. of Arboriculture, Champaign, IL

Matheny, N.P., Clark, J.R. 1994. "A Photographic Guide to the Evaluation of Hazard Trees in Urban Areas", Inter. Soc. of Arboriculture, Champaign, IL, 85 pp.

MANAGEMENT

Harris, R.W., Matheny, N.P., Clark, J.R., 2004. "Arboriculture: Intergrated Management of Landscape Trees, Shrubs and Vines (4th ed.)", Prentice Hall, Upper Saddle River, NJ, 578 pp.

Pirone, T.P., Hartman, J.R., Sall, M.A., 2000. "Pirone's Tree Maintenance (7th ed.)", Oxford University Press, New York, NY, 560 pp.

PLANNING

Bernhardt, E.A., Swiecki, T.J., 2001. "Guidelines for Developing and Evaluating Tree Ordinances", California Department of Forestry and Fire Protection - Urban Forestry Program, Sacramento, CA, 76 pp.

Council of Tree and Landscape Appraisers, 2000. "Guide For Plant Appraisal (9th ed.)" Inter. Soc. of Arboriculture, Champaign, IL, 143 pp.

Elmendorf, W., Gerhold, H., 1999. "A Guide to Preserving Trees in Development Projects". UH-122., Penn State University, University Park, PA, 27 pp.

Merullo, V.D., Valentine, M.J., 1992. "Arboriculture and the Law", Inter. Soc. of Arbor., Champaign, IL, 110 pp.

Miller, R.W., 1997. "Urban Forestry, Planning and Managing Urban Greenspaces", Prentice Hall, Upper Saddle River, NJ, 502 pp.

Schein, Richard D. 1993. "Street Trees: A Manual for Municipalities", Tree Works, State College, PA, 398 pp.

Wolf, Kathleen L., et. al. "Urban Trees and Human Health: A Scoping Review". Int J Environ Res Public Health. 2022 Jun; 17(12): 4371. Published online 2022 Jun 18. doi: 10.3390/ijerph1712437

PLANT IDENTIFICATION

Brockman, C.F., 2001. "Trees of North America - A Guide to Field Identification", Golden Field Guide from St. Martin's Press, New York, NY, 289 pp.

Dirr, Michael A. 1998. "Manual of Woody Landscape Plants: Their Identification, Ornamental Characteristics, Culture, Propagation and Use, (5th ed.)", Stipes Publishing Company, Champaign, IL, 1,187 pp.

Fisher, K., 2000. "Taylor's Guide to Shrubs", Houghton Mufflin, Boston, MA, 441 pp.

Grimm, W.C., rev. Kartesz, J., 2002. "The Illustrated Book of Trees", Stackpole Books, Mechanicsburg, PA, 695 pp.

Harlow, Dr. William M. 1959. "Fruit Key & Twig Key to Trees and Shrubs", Dover Publications, Inc., New York, NY, 56 pp.

PLANT SELECTION

Gerhold, Henry D., Lacasse, Norman L., Wandell, Willet N. 1993. "Street Tree Factsheets", Penn State University, University Park, PA, 400 pp.

Hasselkus, E. R. 1998. "A Guide to Selecting Landscape Plants for Wisconsin", A-2865, University of Wisconsin Extension, Madison, WI

PLANTING TECHNIQUES

Watson, G.B., Himelick, E.B., 1997. "Principles and Practices of Planting Trees and Shrubs", Inter. Soc. of Arboriculture, Champaign, IL, 200 pp.

Minnesota Society of Arboriculture, 2003. "Preventing Stem Girdling Roots", VHS Tape

PRUNING

ANSI A300 (Part 1)-2017 Pruning. "Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices (Pruning)". Tree Care Industry Association, Inc. Londonderry, NH, 33pp.

Gilman, Edward F., 2002. "Illustrated Guide to Pruning (2nd ed.)", Inter. Soc. of Arboriculture, Champaign, IL, 330 pp.

Harris, R.W., Matheny, N.P., Clark, J.R., 2004, "Arboriculture: Integrated Management of Landscape Trees, Shrubs and Vines (4th ed.)". Prentice-Hall, Upper Saddle River, NJ, 578 pp.

Hasselkus, E. R., 1993. "Caring for Your Established Shade Trees". A-1817. University of Wisconsin Extension, Madison, WI

Shigo, A. L., 1989. "Tree Pruning", Shigo and Trees, Durham, NH, 186 pp.

Shigo, A. L., 1989. "A New Tree Biology (2nd ed.)", Shigo and Trees, Durham, NH, 727 pp.

TREE PRESERVATION

Matheny, Nelda, Clark, James R., 1998. "Trees and Development, A Technical Guide to Preservation of Trees During Land Development", Inter. Soc. of Arboriculture, Champaign, IL, 184 pp.

WEBSITES FOR INFORMATION ON TREES

Wisconsin's Emerald Ash Borer Resource <http://emeraldashborer.wi.gov/>

Wisconsin's Gypsy Moth Resource <http://www.gypsymoth.wi.gov/>

Insect Diagnostic Lab, UW-Madison <http://labs.russell.wisc.edu/insectlab/>

Plant Disease Diagnostic Clinic, UW-Madison <https://pddc.wisc.edu/>

UW-Extension Wisconsin Horticulture <https://hort.uwex.edu/>

Tree Care Information <http://www.treesaregood.org/>

Wisconsin Arborist Association <http://www.waa-isa.org/>

Appendix E: Standards and Guidelines

These provisions are intended to provide standards and guidelines for the preservation of trees as part of the land development and/or building construction process. The City of Pewaukee finds that such preservation is necessary to promote the general health and welfare of the community by making the City a more attractive place to live, protect watercourses and ecology, provide a healthy living environment, and to better maintain control of flooding, noise, glare, and soil erosion. The City further finds that trees provide beneficial oxygen while reducing the levels of harmful carbon dioxide and reduce air pollution, purify water, and stabilize soil. Trees also provide wildlife habitat and shade, cool the land, reduce noise, and provide an aesthetic value to the land.

Table 5. Sample Specimen Tree List

SPECIES	Min. DBH	SPECIES	Min. DBH
American Basswood	20"	Common Hackberry	16"
Sugar Maple	12"	American Beech	12"
All Serviceberries	6"	All Oaks	12"
Musclewood	6"	White Pine	12"
All Hickories	12"	Butternut	12"
Black Walnut	12"	Black Cherry	12"
Eastern Red Cedar	8"	Ironwood	6"
Tamarack or Larch	12"	White Cedar	12"
Kentucky Coffeetree	12"		

Table 6. Size and Tolerance of Tree Species to Construction Impacts.

This table represents information from three publications: Tree Characteristics, Protecting Trees from Construction Damage, Minnesota Extension Service, University of Minnesota; The Response of Ohio's Native and Naturalized Trees to Construction Activity, T. Davis Sydnor, School of Natural Resources, The Ohio State University; and Relative Tolerance of Tree Species to Construction Damage, Kim D. Coder, The University of Georgia Cooperative Extension Service, Forest Resources Unit.

Tolerance to construction impact can vary greatly according to site characteristics such as soil depth, individual tree characteristics such as rooting habit, prevailing weather conditions such as drought, and the degree of construction impact.

		SOIL	MATURE	HAZARD	
	ROOT	COMPACTION AND	CROWN SPREAD	POTENTIAL	
SPECIES	SEVERANCE	FLOODING	(FEET)	RATING*	COMMENTS
Norway Spruce	tolerant	tolerant	20-30	medium	vulnerable to windthrow
Colorado Spruce	intermediate	tolerant	20-30	medium	vulnerable to windthrow
White Pine	tolerant	sensitive	40-60	medium	sensitive to drainage changes
Austrian Pine	tolerant	sensitive	30-50	medium	sensitive to poor drainage
Scotch Pine	tolerant	sensitive	30-50	medium	sensitive to poor drainage
Tamarack or Larch	tolerant	tolerant	15-25	medium	
Red Cedar	tolerant	sensitive	10-20	low	
White Cedar	tolerant	tolerant	10-20	low	
All Firs	tolerant	sensitive	10-20	medium	
Horsechestnut	sensitive	sensitive	30-40	medium	
Kentucky Coffeetree	intermediate	intermediate	40-50	medium	
Butternut	sensitive	sensitive	50-60	medium	
Redbud	intermediate	intermediate	25-35	low	sensitive to increased light and heat
All Mulberries	tolerant	tolerant	35-50	high	
Sycamore	tolerant	tolerant	60-80	low	
Pagoda Dogwood	intermediate	intermediate	15-20	low	sensitive to increased light and heat
Ironwood	sensitive	sensitive	20-30	low	
Musclewood	sensitive	sensitive	20-30	low	
All Hickories	intermediate	sensitive	30-40	medium	
Amur Corktree	intermediate	intermediate	30-40	medium	
Hackberry	tolerant	intermediate	40-50	low	
Ohio Buckeye	sensitive	sensitive	30-40	medium	
Catalpa	intermediate	tolerant	30-50	medium	
Bur Oak	tolerant	tolerant	40-80	low	
Red Oak	tolerant	sensitive	40-50	low	
White Oaks	sensitive	sensitive	50-90	low	
Sugar Maple	tolerant	sensitive	60-80	medium	sensitive to fill
Red Maple	tolerant	tolerant	40-60	medium	sensitive to wounding
Norway Maple	tolerant	tolerant	60-80	medium	
Black Cherry	intermediate	sensitive	40-50	low	
White Ash	tolerant	intermediate	40-70	medium	
All Serviceberries	intermediate	intermediate	15-20	low	
American Beech	sensitive	sensitive	30-50	medium	sensitive to fill
European Beech	sensitive	sensitive	40-60	medium	sensitive to fill
Honeylocust	tolerant	tolerant	50-75	medium	
Black Walnut	sensitive	intermediate	50-70	medium	

TABLE 7. Guidelines for Tree Protection Zones

SPECIES TOLERANCE TO IMPACTS	TREE AGE	DISTANCE FROM TRUNK* (feet per inch of DBH)
tolerant	young	0.5'
	<1/4 life expectancy	
	middle aged	0.75'
	1/4 - 3/4 life expectancy	
	mature	1.0'
	>3/4 life expectancy	
intermediate	young	0.75'
	middle aged	1.0'
	mature	1.25'
sensitive	young	1.0'
	middle aged	1.25'
	mature	1.5'

Calculating the Optimal Tree Protection Zone

1. Evaluate the species tolerance of impact: tolerant, intermediate, sensitive (see Table 6).
2. Identify specimen tree age: young, mature, or overmature.
3. Using **Table 7**, find the distance (in feet) from the trunk that should be protected per inch of trunk diameter.
4. Multiply the distance by the trunk diameter to calculate the optimum radius (in feet) for the tree protection zone.

Examples:

A healthy 50-year-old, 15" diameter Northern Red Oak (*Quercus rubra*) (good tolerance, mature age):

$$0.75' \times 15'' = 11.25' \text{ radius for Tree protection zone}$$

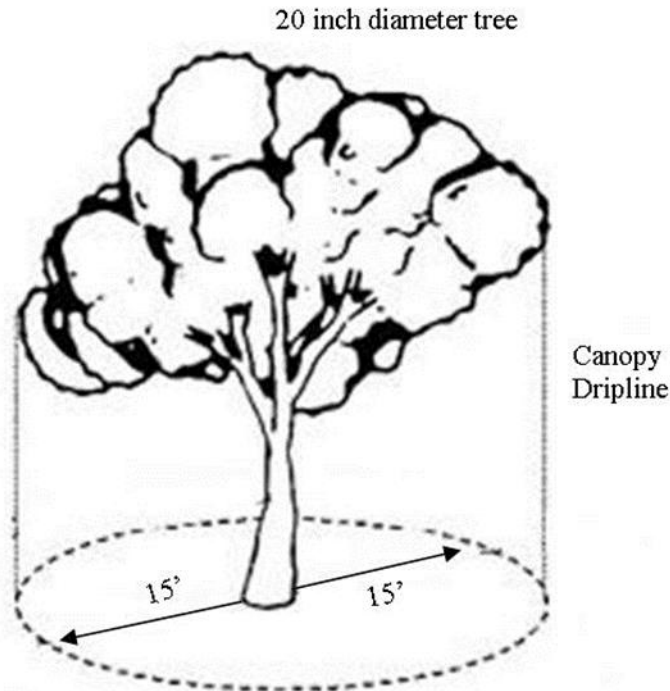
A declining 90-year-old, 26" diameter Shagbark hickory (*Carya ovata*) (intermediate tolerance, overmature age):

$$1.25' \times 26'' = 32.5' \text{ radius for Tree protection zone}$$

The tables and formulas are strictly guidelines, not an absolute rule, and may need to be adjusted in the field to meet local conditions and design criteria. It is best and least expensive to protect trees in groupings during construction. Groupings offer the best protection for soil, root systems and associated plants.

Site Clearing Specifications

Figure 3. Extent of Tree Protection Zone.



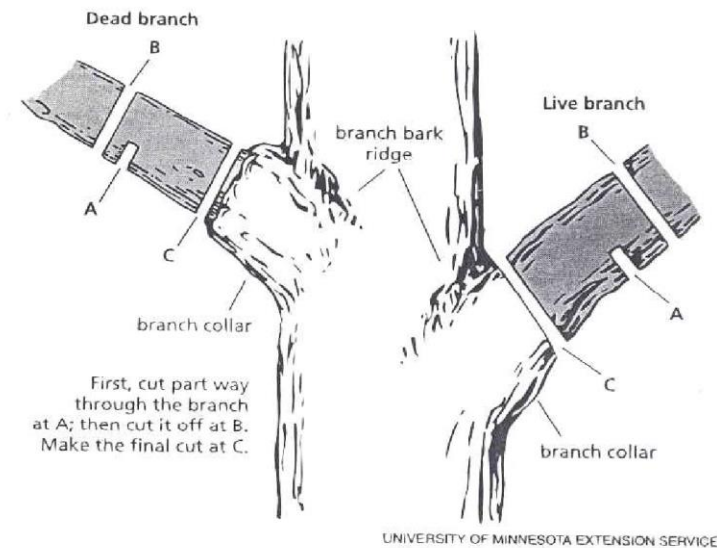
The following work must be accomplished before any demolition or site clearing activity occurs within 50 feet of specimen trees:

1. The site clearance/demolition contractor is required to meet with the City Forester at the site prior to beginning work to review all work procedures, access and haul routes, and tree protection measures.
2. Limits of all TPZ(s) shall be staked by the contractor in the field. A 4-foot plastic, wood or chain link fence with posts sunk in the ground at no more than 10' on center shall be erected to enclose each TPZ. Weather resistant signs with the wording: KEEP OUT – TREE PROTECTION ZONE shall be erected by the contractor at each TPZ. Signs shall be placed a minimum of 30' on center on the TPZ fencing. Each TPZ shall have a minimum of one sign.
3. Tree(s) to be removed that have branches extending into the canopy of tree(s) to remain must be removed by a qualified arborist and not by demolition or construction contractors. The qualified arborist shall remove the tree in a manner that causes no damage to the tree(s) and understory to remain.
4. Any brush clearing required within the TPZ shall be accomplished by a qualified arborist using hand-operated equipment.

5. Trees to be removed shall be felled so as to fall away from TBZ(s) and to avoid pulling and breaking of roots to remain.
6. Trees to be removed within the tree protection zone shall be removed by a qualified arborist. The trees shall be cut near ground level and the stump ground out.
7. All downed brush and trees shall be removed from the TPZ either by hand or with equipment sitting outside the TPZ. Extraction shall occur by lifting the material out, not by skidding it across the ground.
8. Brush shall be chipped and hauled offsite or stored to be used as a buffer over root zones.
9. Structures and underground features to be removed within the TPZ shall use the smallest equipment possible and operate from outside the TPZ. The City Forester shall be on site during all operations within the TPZ to monitor demolition activities.
10. All trees to be pruned in accordance with the provided Pruning Specifications.
11. Any damage to trees due to clearing or demolition activities shall be reported to the City Forester within 6 hours so remedial action can be taken. Timeliness is critical to tree health.
12. If temporary haul or access roads must pass over the root areas of trees to be retained, a roadbed shall be constructed by laying appropriate geo-textile fabric on the surface and covering with 8 inches of mulch or gravel to protect the soil from compaction. The road bed material shall be replenished as necessary to maintain an 8-inch depth.

Pruning Specifications

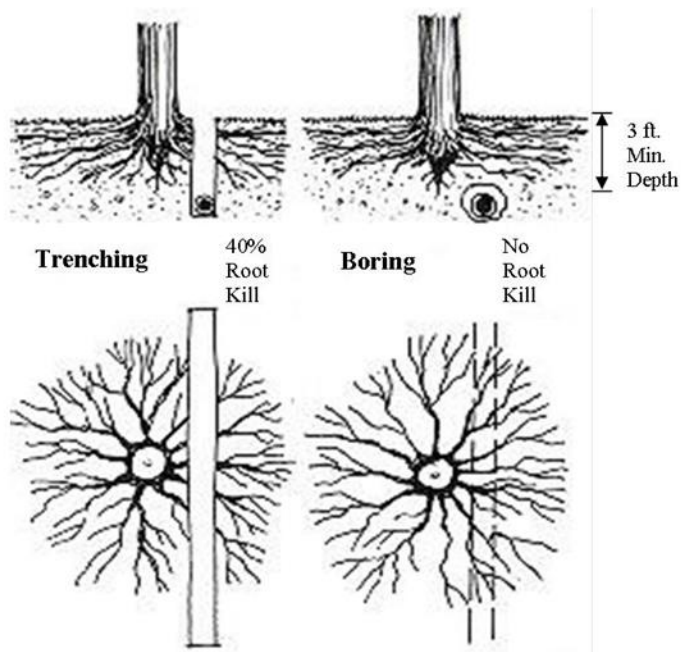
Figure 4. Proper Pruning Techniques.



1. All pruning shall be performed by a qualified arborist under the direct, on-site supervision of a Certified Arborist.
2. All pruning shall be in accordance with the ANSI A300 Pruning Standard (American National Standard for Tree Care Operations) and adhere to the most recent edition of ANSI Z133.1 Safety Requirements for Tree Care Operations.
3. Where temporary clearance is needed for access, branches shall be tied back to hold them out of the clearance zone.
4. Pruning shall not be performed on Oaks or Elms during the time period of April 15th thru September 1st due to the potential spread of Oak Wilt and Dutch Elm disease.
5. Interior branches shall not be stripped out.
6. Pruning cuts larger than 4 inches in diameter, except for deadwood, shall be avoided.
7. No more than 20 percent of live foliage shall be removed within the trees.
8. Brush shall be chipped and chips shall be spread underneath trees within the TPZ to a maximum depth of 6 inches, leaving the trunk clear of mulch.

Construction Specifications

Figure 5. How Boring Saves Trees.



1. Before beginning work, the contractor is required to meet with the City Forester at the site to review all work procedures, access routes, utility corridors, storage areas, and tree protection measures.
2. Fences have been erected and sign have been posted to protect trees to be preserved. Fences define a specific protection zone for each tree or group of trees. Fences and signs are to remain until all site work has been completed. Fences or signs may not be relocated or removed without the permission of the City Forester.
3. Construction trailers and traffic and storage areas must remain outside fenced areas at all times.
4. All underground utilities and drain or irrigation lines shall be routed outside the TPZ. If lines must traverse the protection area, they shall be tunneled or bored under the tree. (See Table 3) Utilities shall be placed in a common trench where practical. Soil removed from trenches shall be placed on the side away from trees and replaced as soon as possible. Trench walls shall be shored rather than sloped to reduce trench width.

Table 8. Trench Augering Distances

The distance from tree face for augering in each direction if trench is located within a particular radius of a TPZ (Morell 1984).

Tree Diameter (DBH)	Auger distance from face of tree
0-2"	1'
3-4"	2'
5-9"	5'
10-14"	10'
15-19"	12'
over 19"	15'

5. No materials, equipment, spoil, or waste or washout water may be deposited, stored, or parked within the TPZ.
6. Additional tree pruning required for clearance during construction must be performed by a qualified arborist and not by construction personnel.
7. Any herbicides placed under paving materials must be safe for use around trees and labeled for that use. Any pesticides used on site must be tree-safe and not easily transported by water.
8. If injury should occur to any tree during construction, it should be evaluated as soon as possible by the City Forester so that appropriate treatments can be applied.
9. Any grading, construction, demolition, or other work that is expected to encounter tree roots must be monitored by the City Forester. Specific locations or tree tag numbers shall be identified prior to work commencing.
10. Erosion control devices such as silt fencing, debris basins, and water diversion structures shall be installed to prevent siltation and/or erosion within the TPZ.

11. Before grading, pad preparation, or excavation for foundations, footings, walls, or trenching, specimen tag # trees, shall be root pruned 1 foot outside the TPZ by cutting all roots cleanly to a depth of 36 inches, normal depth of root penetration. Roots shall be cut manually digging a trench and cutting exposed roots with a saw, vibrating knife, rock saw, a narrow trencher with sharp blades, or other approved root-pruning equipment.
12. Any roots damaged during grading or construction shall be exposed to sound tissue and cut cleanly with a saw or other appropriate sharp cutting instrument.
13. If temporary haul or access roads must pass over the root areas of trees to be retained, a roadbed shall be constructed by laying appropriate geo-textile fabric on the surface and covering with 8 inches of mulch or gravel to protect the soil from compaction. The road bed material shall be replenished as necessary to maintain an 8-inch depth.
14. Spoil from trenches, basements, or other excavations shall not be placed within the TPZ, either temporarily or permanently.
15. No burn piles or debris pits shall be placed within the TPZ. No ashes, debris, or garbage may be dumped or buried within the TPZ.
16. Maintain fire-safe areas around fenced areas. Also, no heat sources, flames, ignition sources, or smoking is allowed near mulch or trees.

Grading

1. Maintain the root flare at the bottom of trees. Do not bury the trunk flare.
2. For small grade changes (1 to 2 feet) slope to natural grade rather than construct a retaining wall. For larger grade changes, retaining walls can increase the distance of natural grade and therefore should be considered.
3. Within or in close proximity to a TPZ, adjust surrounding grades to match base trunk elevation as closely as possible.
4. Where grade must be raised, determine the location of the proposed structure on the fill area, plus required overbuild. If within a TPZ, a retaining wall may be required at that location.
5. If TPZ is in a low area that will collect water, a drain shall be installed as far from the tree as possible, near the retaining wall. Fine grade the area by hand to create flow to the drain.
6. Where required grade changes prohibit the establishment of an adequate TPZ, the tree/trees shall be removed and replanting of appropriate trees (per mitigation requirements). Planting for that location shall be performed after final grades are installed.

Mitigation Requirements for Specimen Trees

1. Report any damage or injury to specimen trees within 6 hours to the City Forester so that mitigation can take place.
2. If inadvertent compaction occurs in the upper 12" of soil within the TPZ, the soil shall be loosened by a method approved by the City Forester, such as vertical mulching or soil fracturing.
3. Irrigate to wet the soil within the TPZ during periods of drought as specified by the City Forester.
4. Where roots 2" and larger are encountered in trenches, they must be cleanly cut back to a sound lateral root. All exposed root areas within the TPZ shall be backfilled or covered within one hour. If this cannot be accomplished, then the roots shall be covered with layered wet burlap until backfilling can occur to reduce evaporation from trench walls.
5. If bark or trunk wounding should occur, current bark tracing and treatment methods shall be performed by a qualified arborist within two days.
6. Where injury occurs to branches, within 5 days, the broken or torn branch shall be cut back to an appropriate branch capable of resuming terminal growth. Work shall be performed by a qualified arborist. If foliage is heat scorched from equipment exhaust pipes, the City Forester shall be informed within 6 hours.
7. Where a specimen tree is removed by design or error, replacement shall be at a ratio of 1" of DBH of replacement for every 1" of DBH of removal. Replacement trees shall be of a size and species as determined by the City of Pewaukee.
8. If a specimen tree incurs significant damage to its roots, bole or crown, the City Forester will determine the Tree Appraisal value. This will be determined by adjusting the tree's basic value by its species, location and condition using the most recent edition of the *Guide for Plant Appraisal*, published by the Council of Tree and Landscape Appraisers. The formula and appraisal methods used shall be noted.

Alternative Construction Techniques

1. Where grades are to be raised, excavation towards trees is minimized with L-type footings, with the L of the footing extending towards the fill and away from the tree. In cuts, the footing shall extend towards the cut and away from the tree.
2. For grade changes over 5 feet, two or more smaller retaining walls shall be considered and stepped down the slope to reduce the mass of a larger single wall.
3. Where structures must be placed close to a TPZ, alternative footing designs shall be considered. These include: the use of custom footings in the vicinity of trees that bridge over tree roots; cantilevering the structure, so the building extends outward from the footing; and installing a raised foundation with discontinuous footings (piers).

Aftercare

1. Avoid putting trees in stress for several years after construction. Water during periods of drought and treat for insect and disease infestations when they arise.
2. Contact a Certified Arborist about whether fertilizing trees is appropriate. Be sure not to overdo it. Trees with damaged roots can't take up and utilize excessive amounts of fertilizer. Also consider mycorrhizae applications to assist with root regeneration and Cambistat (a plant growth regulator) to redirect the root to shoot ratio to producing more root growth.
3. Aerate compacted soils if there are large trees on the site where roots are growing in compacted areas of the site. Aeration can be done to shallow depth with standard core aerators or to deeper depths by vertical mulching with air spades or gas powered augers.
3. If root damage or loss should occur, estimate the percentage of damage or loss and thin out the top in direct proportion to root loss.
4. Protect root zones of both existing and newly planted trees with 3 to 4 inches of organic mulch. Keep mulch several inches away from the trunk base and mulch all the way to the dripline where feasible.
5. Keep competing vegetation especially grass away from trees. Consider alternative landscaping in the areas beneath trees. Use native plants and groundcovers that can provide a variety of sizes, colors and forms beneath preserved trees. These plantings preserve tree root systems, conserve water and reduce the reliance on fertilizers and pesticides.

Standards and Guidelines References

American National Standards Institute. 2000. ANSI Z133.1 Safety Requirements. *American National Standards for Arboricultural Operations – Pruning, Repairing, Maintaining, and Removing Trees, and Cutting Brush – Safety Requirements*. New York, NY: American National Standards Institute. 32 pp.

American National Standards Institute. 2017. ANSI A300 Pruning Standard. *American National Standards for Tree Care Operations – Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices (Pruning)*. Londonderry, NH: Tree Care Industry Assoc., Inc. 33 pp.

Council of Tree and Landscape Appraisers (CTLA). 2000. *Guide for Plant Appraisal* (9th ed.). Champaign, IL: International Society of Arboriculture. 143 pp.

Elmendorf, W., H. Gerhold, and L. Kuhns. 1999. *A Guide to Preserving Trees in Development Projects*. University Park, PA: The Pennsylvania State University. 27 pp.

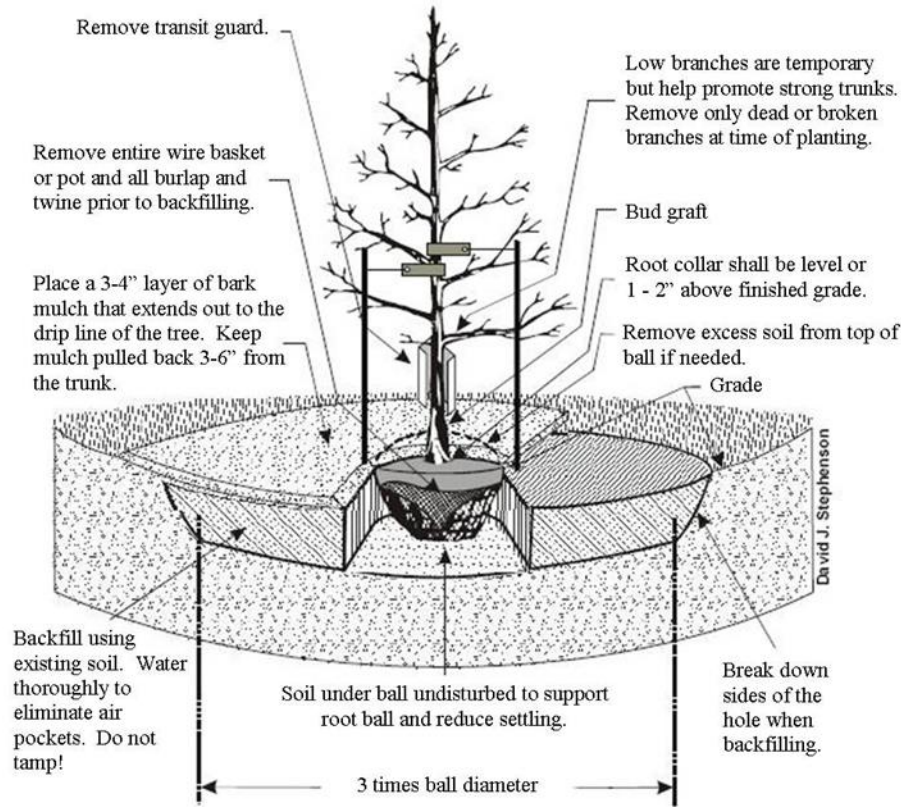
Harris, R.W. 1992. *Arboriculture: Integrated Management of Landscape Trees, Shrubs and Vines*. 2nd ed. Englewood Cliffs, NJ: Prentice Hall. 674 pp.

Matheny, N., and J. Clark. 1998. *Trees and Development: A Technical Guide to Preservation of Trees During Land Development*. Champaign, IL: International Society of Arboriculture. 183 pp.

Morell, J.D. 1984. Parkway tree augering specifications. *Journal of Arboriculture* 10(5):129 – 1

Appendix F: Planting Specifications

Figure 7. Tree Planting Detail.



a) All plant material shall be true to name and type, and first-class representatives of their species or variety. They shall have normal, well-developed branches, be healthy, vigorous plants free from defects, plant disease, and all forms of infestation or objectionable disfigurements. Either bare root or balled and burlaped trees are acceptable. All plant material shall conform to American Standard for Nursery Stock (ANZI Z60.1-2004 or later).

b) Diggers Hotline will be contacted to mark all planting areas before any work is carried out.

c) Site Disturbances: Take precautions to insure that equipment and vehicles do not disturb or damage existing site grading, walks, drives utilities, plants, etc. Replace and/or return to original condition any damage caused by Contractor's negligence at no cost to Owner.

d) The trees shall be planted according to the planting plan. Unless otherwise approved, the trees shall also be located five (5) feet from all sewer and water laterals, and ten (10) feet from driveways, light poles and fire hydrants. No trees shall be planted within 25 feet of any street corner.

e) All trees planted shall be of minimum size of 1.5" to 2.5" in caliper. Said caliper reading shall be taken 6" above the ground surface.

f) Plants stored on site must be mulched and watered. The root balls can not dry out.

g) The size for the tree installation hole shall preferably be two to three times the root ball in diameter where feasible. Trees shall be planted with the root collar (root flare) exposed and at or slightly above the surface level. For balled trees, the hole shall be at least 18" larger than the largest diameter of the ball and no deeper than the ball. Place no soil on top of the root ball.

h) Care should be taken to remove as much planting material from the root ball as possible without compromising the structure of the root ball. At a minimum, all planting material must be removed from the top half of the root ball. Planting twine must be removed, especially twine that comes into contact with the tree trunk, to prevent any future trunk girdling issues. It is recommended that burlap and wire be removed during the plant installation process.

i) Soil for backfilling around roots and/or root balls shall be the existing soil from the excavation. Where existing soil is rocky and poor quality, the local brown topsoil may be used. Soil shall be pulverized and screened. All material dug from the plant holes and not used shall be removed from the site and disposed of. Immediately after planting, soil around roots and balls shall be thoroughly watered.

j) At the time of planting, trees shall be pruned to remove dead, broken, or diseased branches or cross branches that rub. As much of the leaf surface as possible shall be maintained to create food for the tree. Trees shall appear symmetrical in shape and appearance. Trees shall have a single, straight leader.

k) Persons installing street trees shall take all necessary precautions to minimize the damage to existing lawns. Any damage to existing lawns shall be repaired by placing topsoil and seed in the damaged area.

l) Plants shall be lifted and handled from the bottom of the ball only. Not dragged, lifted or pulled by the trunk or foliage parts in a manner that will loosen the roots in the ball.

m) All plants shall be mulched over the root system with a 3 - 4 inch layer of wood chips or bark immediately after planting. Mulching material shall be pulled back no less than 2 - 3" and no more than 6" from the trunk. Mulch between the plants may be deeper depending upon the individual plan.

n) Only those plants designated by the Purchaser shall be wrapped, staked and/or guyed. Staking shall consist of a minimum of two posts or stakes. The minimum length of the posts shall be the depth of the bore plus one-half the height of the tree. The posts shall be installed at least one foot outside the diameter of the tree planting hole. The tree shall be connected to the posts with a 2"x 1/16" strap of such design so as not to damage the tree. The tree shall be planted as plumb as possible and the contractor shall maintain tree plumb ness throughout the guarantee period. All stakes shall be removed within one year of planting.

o) Trees planted between June 1 and September 15, shall be balled and burlaped.

p) All installation must be inspected by the City Forester, or a representative. If, in the sole opinion of the City Forester, additional remedies are needed to assure the stocking and maintenance of healthy tree specimens, additional remedies may be required.

**CITY OF PEWAUKEE
COMMON COUNCIL AGENDA ITEM 4.**

DATE: January 16, 2023

DEPARTMENT: Public Works

PROVIDED BY: Nick Fuchs

SUBJECT:

Discussion and Possible Action Regarding a Request by Interstate Partners to Remove Weight Limit Restrictions Along Green Road Between Redford Boulevard (Highway F) and Duplainville Road [Wagner]

BACKGROUND:

At the October 20th Plan Commission and November 7th Common Council meetings, the applicant received the necessary approvals to rezone property along Green Road and construct an approximately 116,000 square foot industrial building.

Currently, when weight limits are in place, trucks exceeding 6-tons must utilize Duplainville Road for entering and exiting the site. The property owner is requesting to remove that restriction to allow trucks to also proceed west to the ramp leading to Highway F.

The applicant has provided a letter making this request as well as a plan illustrating truck movements from their site to Highway F.

It can be noted that the two properties to the west, totaling approximately 7.8 acres are also designated as Manufacturing/Fabrication/Warehousing on the City's Year 2050 Land Use/Transportation Plan map.

UPDATE:

FINANCIAL IMPACT:

RECOMMENDED MOTION:

Recommendation to remove weight limit restrictions along Green Road between Duplainville Road and the Highway F ramp, subject to the applicant completing road improvements and additional signage as recommended by the Engineering Department and Waukesha County to better accommodate truck movements.

ATTACHMENTS:

Description

Green Road Weight Limit Release Request

Green Road-HWY F Truck Turning Exhibit



Interstate Partners LLC

N16 W23217 Stone Ridge Drive • Suite 120 • Waukesha, WI 53188 • Tel: 262.506.1000 • Fax: 262.506.1001 • interstatepartners.com

October 18, 2022

City of Pewaukee
W240 N3065 Pewaukee Road
Pewaukee, WI 53072

RE: IP Green Road – New Building Request

To Common Council Members:

Interstate Partners (IP Green Road LLC) is proposing a development consisting of one building totaling approximately 116,000 square feet of commercial / light industrial / distribution space (please see attached site plan). The request is also for approval of a proposed CSM and rezoning of the land from M-6 to M-2, and another portion of the site from RS-3 to M-2.

The proposed building is on Green Road, which has a 6-ton weight limit from Highway 164 to Duplainville Road. If the building were to be constructed, it is believed the potential tenant(s) would have trucks associated with their business operations that would need to travel on Green Road. We are requesting the Common Council consider lifting the weight restriction for the 0.5 mile stretch of Green Road from Duplainville Road to the onramp on the north side of Green Road to Highway F. All trucks would be directed by signage not to travel further west on Green Road than Highway F.

A portion of the subject site is already zoned M-6, and allowing some truck traffic on a section of Green Road would be essential to any business operating out of this location, or adjacent sites in the future.

Please feel free to contact me with any questions or comments.

Thank you for consideration of this matter.

Sincerely,

Caroline Brzezinski
Vice President, Interstate Partners
262-506-6204
cb@interstatepartners.com

File: R2020151527058 Green Tridings\1527058 Redford Green TRUCK TURN.dwg Layout: EXHIBIT User: amara Plotter: Nov 16, 2022 2:28pm Xref's:



Call 811 or (800) 242-8511

Milwaukee Area (262) 432-7910

Hearing Impaired TDD (800) 542-2289

www.DiggersHotline.com



CREATE THE VISION TELL THE STORY

jsdinc.com

MILWAUKEE REGIONAL OFFICE
W238 N1610 BUSSE ROAD, SUITE 100
WAUKESHA, WISCONSIN 53188
P. 262.513.0666

CLIENT:



CLIENT ADDRESS:

N16 W23217 STONERIDGE DR.
WAUKESHA, WI 53188

PROJECT:

GREEN ROAD
INDUSTRIAL BUILDING

PROJECT LOCATION:

CITY OF PEWAUKEE, WI
WAUKESHA COUNTY

PLAN MODIFICATIONS:

#	Date:	Description:
1	11-16-2022	CITY COMMENTS
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Designed By: APM 10-10-2022
Reviewed By: RW 10-10-2022
Approved By: RW 10-10-2022

SHEET TITLE:
GREEN ROAD RAMP
WB-67 TRUCK TURNING
TEMPLATE

SHEET NUMBER:

EXHIBIT

JSD PROJECT NO:

15-7055

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

Wagner, Magdelene

From: Wagner, Magdelene
Sent: Tuesday, December 20, 2022 5:10 PM
To: Kevin Yanny
Cc: Jason Mayer; Karen Braun
Subject: RE: City of Pewaukee Green Road / County Road Highway F

Hi Kevin,

The current weight limit on Green Road is 6 TON.

Interstate Partners is building a spec building right now, but the latest information I heard is they may have an actual client. It is a proposed 165,000 SF industrial building. Attached is a link to their preliminary information.
<https://www.dropbox.com/s/2uht7kn6s379oje/Interstate%20Partners%20Site%20%26%20Building%20Plan%20Submittal.zip?dl=0>

The problem we will have with opening up Green Road is that not only will this new development use this road, but potentially Quad Graphics, Arronin Steel, PLM, etc. so I can't give you a great idea of the new traffic which would now be using this ramp.

Hope you all have a Merry Christmas and Happy New Year.
Maggie

Magdelene Wagner, P.E.
Director of Public Works/City Engineer
City of Pewaukee
W240N3065 Pewaukee Road
Pewaukee, WI 53072
262-691-0804

[Find us on Facebook](#)

This message originates from the City of Pewaukee. It contains information that may be confidential or privileged and is intended only for the individual named above. It is prohibited for anyone to disclose, copy, distribute, or use the contents of this message without permission, except as allowed by the Wisconsin Public Record Law. If this message is sent to a quorum of a governmental body, my intent is the same as though it were sent by regular mail and further e-mail distribution is prohibited. All personal messages express views solely of the sender, which are not attributed to the municipality I represent and may not be copied or distributed with this disclaimer. If you have received this message in error please notify me immediately.

From: Kevin Yanny <KYanny@waukeshacounty.gov>
Sent: Tuesday, December 20, 2022 2:48 PM
To: Wagner, Magdelene <wagner@pewaukee.wi.us>
Cc: Jason Mayer <JMayer@waukeshacounty.gov>; Karen Braun <KBraun@waukeshacounty.gov>
Subject: RE: City of Pewaukee Green Road / County Road Highway F

Maggie,

I spoke with Karen this afternoon regarding city concerns at CTH F ramp road.

We understand your concerns regarding ingress/egress onto CTH F. There are turn bays, but they are not very long. However, we have no plans for intersection improvements here. We completed roadway pavement

improvements on CTH F not that long ago. Karen checked and there is not a significant number of accidents occurring at/near the CTH F & Ramp Road intersection.

Before we formally comment, I have some follow-up questions for you. What is existing weight limit on Green Road? What type of development is Interstate Partners developing? What amount of truck traffic will they generate?

Yes, we would like to review plans if you require developer to complete improvements at the Green Road end of the ramp road.

Thanks,
Kevin

From: Kevin Yanny <KYanny@waukeshacounty.gov>
Sent: Friday, December 16, 2022 7:58 AM
To: Wagner, Magdelene <wagner@pewaukee.wi.us>
Cc: Jason Mayer <JMayer@waukeshacounty.gov>; Karen Braun <KBraun@waukeshacounty.gov>
Subject: RE: City of Pewaukee Green Road / County Road Highway F

Hello Maggie,

On Monday I should have a chance to discuss your questions with Karen & Jason.

Regarding the bridge under-clearance, the southbound CTH F bridge has the limiting clearance over Green Road. Green Road was constructed 2013, and I rechecked clearances in 2014 once final asphalt was placed. Clearance is 15.74 feet. No clearance signing is required for this clearance.

Thanks,
Kevin

From: Wagner, Magdelene <wagner@pewaukee.wi.us>
Sent: Thursday, December 15, 2022 5:33 PM
To: Kevin Yanny <KYanny@waukeshacounty.gov>
Cc: Jason Mayer <JMayer@waukeshacounty.gov>; Karen Braun <KBraun@waukeshacounty.gov>
Subject: RE: City of Pewaukee Green Road / County Road Highway F

CAUTION: This email originated from an unverified external source. Verify the legitimacy of the email before clicking links or opening attachments. If you believe this email is malicious in nature, please report it by using the Phish Alert button in Outlook.

Hi Kevin,

Just an FYI-I took Caroline off the email list for this discussion.

The Council is mainly concerned with the safety of trucks entering and exiting off CTH F onto the ramp if we open it up to full truck traffic. I understand that today some trucks take this ramp, but if we lift the weight restriction on Green Road, we will have many more trucks taking this ramp to/from Green Road. Is there any concern from the County regarding those increased truck traffic getting onto and off CTH F. I know the turn lanes and accel/decel lanes are not super long at this location.

We will be requiring Interstate to complete some wider turning radii from Green Road to the ramp to accommodate the wider truck turning movements which were not designed as part of the Green Road project. This will obviously require permits from the County to construct. Do you also want to review the design? As of right now, I see the northeast radii

needing to be wider. We have requested they review the truck turning movements to determine if any additional improvements will be needed.

Finally, I don't believe this will be an issue, but any concerns with clearances for the CTH F bridge on Green Road?

I am available Friday afternoon or Monday morning if this is better off as a phone call.

Thank you,
Maggie

Magdelene Wagner, P.E.
Director of Public Works/City Engineer
City of Pewaukee
W240N3065 Pewaukee Road
Pewaukee, WI 53072
262-691-0804

[Find us on Facebook](#)

This message originates from the City of Pewaukee. It contains information that may be confidential or privileged and is intended only for the individual named above. It is prohibited for anyone to disclose, copy, distribute, or use the contents of this message without permission, except as allowed by the Wisconsin Public Record Law. If this message is sent to a quorum of a governmental body, my intent is the same as though it were sent by regular mail and further e-mail distribution is prohibited. All personal messages express views solely of the sender, which are not attributed to the municipality I represent and may not be copied or distributed with this disclaimer. If you have received this message in error please notify me immediately.

From: Kevin Yanny <KYanny@waukeshacounty.gov>
Sent: Thursday, December 8, 2022 3:21 PM
To: Caroline Brzezinski (cb@interstatepartners.com) <cb@interstatepartners.com>
Cc: Wagner, Magdelene <wagner@pewaukee.wi.us>; Jason Mayer <JMayer@waukeshacounty.gov>; Karen Braun <KBraun@waukeshacounty.gov>
Subject: FW: City of Pewaukee Green Road / County Road Highway F

Caroline,

Per our conversation today, I understand that Interstate Partners is developing a site along Green Road, located to the east of CTH F in the City of Pewaukee. You are asking if trucking is permitted on the ramp road that connects CTH F and Green Road.

To the best of my knowledge, the ramp road is Waukesha County jurisdiction (though it is unnamed). The ramp was constructed by the State of Wisconsin in the mid 1960's when State Trunk Highway 164 (STH 164) was relocated to this alignment. In 2004, the STH 164 roadway was transferred to county jurisdiction and the roadway re-named County Trunk Highway F (CTH F). The state's current certified mileage maps show the ramp road as county jurisdiction. As such, legal traffic on the ramp would be the same as on the adjacent Class I highway (CTH F). Legal loads are <= 80,000 lb. Greater loads would require issuance of single trip oversize permits by Waukesha County DPW. Practically, traffic on the CTH F ramp road would be limited by weight limitations on Green Road (if any).

I hope this helps. Please let me know if any further questions. Thanks,

Kevin J. Yanny, P.E.
Senior Civil Engineer
Waukesha County Dept. of Public Works
515 W. Moreland Blvd., Room 220
Waukesha, WI 53188

Phone: 262-548-7750
Fax: 262-896-8097
kyanny@waukeshacounty.gov

From: Jason Mayer <JMayer@waukeshacounty.gov>
Sent: Thursday, December 8, 2022 10:12 AM
To: Kevin Yanny <KYanny@waukeshacounty.gov>
Subject: FW: City of Pewaukee Green Road / County Road Highway F

Kevin,

Can you answer Caroline's question below?

Feel free to give her a call if need be.

Thanks.

Jason

From: Caroline Brzezinski <cb@interstatepartners.com>
Sent: Tuesday, December 6, 2022 11:51 AM
To: Jason Mayer <JMayer@waukeshacounty.gov>
Subject: Re: City of Pewaukee Green Road / County Road Highway F

CAUTION: This email originated from an unverified external source. Verify the legitimacy of the email before clicking links or opening attachments. If you believe this email is malicious in nature, please report it by using the Phish Alert button in Outlook.

Hi Jason,

Can you please call me when you have a couple minutes to discuss the attached? Sorry the scan isn't as clear as the original map (also attached), but the City of Pewaukee is requiring we get feedback from the county whether the Hwy F onramp (from Green Road) can accommodate trucks. Please let me know when you have a minute to discuss.

Thanks,

Caroline Brzezinski
Interstate Partners LLC
(262) 506-6204

From: Karen Braun <KBraun@waukeshacounty.gov>
Date: Wednesday, June 9, 2021 at 10:31 AM
To: Caroline Moering <cb@interstatepartners.com>
Cc: Jason Mayer <JMayer@waukeshacounty.gov>
Subject: RE: City of Pewaukee County Road M Rehab

Caroline

Jason Mayer is our access person, and I would be able to fill you in on the plans for the M at Watertown intersection. You are welcome to come to our offices to meet in person, or we can schedule a TEAMS virtual meeting.

He following Dates/Times work for Jason and me:

6/14
9am – 12pm
6/16
1 pm – 4:30 pm
6/17
8 am to 4:30 pm

Please let me know if any of these times work for you and if you would like to come in or meet virtually. If we need to look at the week after I can get you more dates as needed.

Karen L. Braun, PE

Engineering Services Manager
Waukesha County Department of Public Works
515 W Moreland Blvd Room 220
Waukesha WI 53188

Phone (262) 896-8538
Cell (262) 424 9032

From: Caroline Brzezinski <cb@interstatepartners.com>
Sent: Wednesday, June 9, 2021 9:14 AM
To: Karen Braun <KBraun@waukeshacounty.gov>
Cc: John Heller <jheller@interstatepartners.com>
Subject: Re: City of Pewaukee County Road M Rehab

CAUTION: This email originated from an external source. Verify the legitimacy of the email before clicking links or opening attachments. If you believe this email is malicious in nature, please report it by using the Phish Alert button in Outlook or by forwarding the message to phishalert@waukeshacounty.gov.

Hi Karen,

Per my email below, I am hoping we can talk to someone on your team regarding our proposed project near the County Road M and U intersection in Pewaukee. There are several unknowns on our end related to County plans for this road/intersection and we would like to discuss our plans with someone if possible. Please let me know who may be a good person to reach out to, or please let me know if you have a moment to discuss.

Thank you,

Caroline Brzezinski
Interstate Partners LLC
(262) 506-6204

From: Caroline Moering <cb@interstatepartners.com>

Date: Friday, May 21, 2021 at 8:30 AM

To: Karen Braun <KBraun@WaukeshaCounty.gov>

Cc: John Heller <jheller@interstatepartners.com>

Subject: City of Pewaukee County Road M Rehab

Hi Karen,

John Heller and I were wondering if you may have a few minutes for a quick meeting or phone call regarding the County's plans for the intersection near Watertown Road and North Avenue in Pewaukee. We currently have land located at the northwest corner under contract and we are working with the city on a possible development. I have attached our proposed site plan. We know there are several issues to work through with both the city and the county regarding the development of this corner, and we were hoping to start by trying to better understand the county's long-term plans for this intersection. Please let me know any availability you may have in the coming weeks.

Thank you,

Caroline Brzezinski
Interstate Partners LLC
(262) 506-6204

We value your feedback. Please visit the [Customer Satisfaction Survey](#) to tell us how we did.

Confidentiality: This e-mail is intended for the specific delivery to and use by the person(s) to whom it is addressed. If you have received this e-mail in error, you are notified that any disclosure, copying, distribution and use of this e-mail or any attachment is prohibited. Please reply to the sender immediately if you have received the e-mail in error, and delete the original and any copy from your computer. Thank you.

Notice: Waukesha County is subject to Wisconsin's Public records law.

Disclaimer

This message originates from the City of Pewaukee. It contains information that may be confidential or privileged and is intended only for the individual named above. It is prohibited for anyone to disclose, copy, distribute, or use the contents of this message without permission, except as allowed by the Wisconsin Public Record Law. If this message is sent to a quorum of a governmental body, my intent is the same as though it were sent by regular mail and further e-mail distribution is prohibited. All personal messages express views solely of the sender, which are not attributed to the municipality I represent and may not be copied or distributed with this disclaimer. If you have received this message in error please notify me immediately.



File: R202015127058 Green RdRamp1527058 Redford-Green TRUCK TURN.dwg Layout: EXHIBIT User: cspeterson PlotDate: Jan 11, 2023 - 11:15am Xref's:



Call 811 or (800) 242-8511
Milwaukee Area (262) 432-7910
Hearing Impaired TDD (800) 542-2289
www.DiggersHotline.com



CREATE THE VISION TELL THE STORY

jsdinc.com

MILWAUKEE REGIONAL OFFICE
W238 N1610 BUSSE ROAD, SUITE 100
WAUKESHA, WISCONSIN 53188
P. 262.513.0666

CLIENT:



Interstate Partners LLC
Real Estate Development

CLIENT ADDRESS:
N16 W23217 STONERIDGE DR.
WAUKESHA, WI 53188

PROJECT:
GREEN ROAD
INDUSTRIAL BUILDING

PROJECT LOCATION:
CITY OF PEWAUKEE, WI
WAUKESHA COUNTY

PLAN MODIFICATIONS:		
#	Date:	Description:
1	11-16-2022	CITY COMMENTS
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Designed By: APM 10-10-2022
Reviewed By: RW 10-10-2022
Approved By: RW 10-10-2022

SHEET TITLE:
GREEN ROAD RAMP
WB-67 TRUCK TURNING
TEMPLATE

SHEET NUMBER:
EXHIBIT

JSD PROJECT NO: 15-7058

THESE PLANS AND DESIGNS ARE COPYRIGHT PROTECTED AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF JSD PROFESSIONAL SERVICES, INC.

**CITY OF PEWAUKEE
COMMON COUNCIL AGENDA ITEM 5.**

DATE: January 16, 2023

DEPARTMENT: Public Works

PROVIDED BY: Magdelene Wagner

SUBJECT:

Discussion and Possible Action Regarding the Revocable Agreement Authorizing Occupancy of Right of Way for Swan View Farms Development [Wagner]

BACKGROUND:

The developer of Swan View Farms installed street trees and private electrical conduits within the City's right of way (ROW) in several areas of the development.

City Staff noted trees planted within the right of way on Phase 1 of the development mainly at the entrance of the subdivision off Swan Road. The plantings did not conflict with our public utilities and we did not require their removal as we agreed they would be maintained by the Homeowner's Association and we could remove/trim as necessary. When Phase 2 of the development came in, we specifically stated a landscaping plan would need to be submitted for review and approval prior to installation of anything within the right of way.

The City received a landscaping plan for the island on Frances Boulevard which did not conflict with the City's utilities and was approved. We were recently notified that a trench in our binder pavement was cut and removed to install conduits to feed electrical wires to the island. The Contractor did not obtain permits for this road cutting or for the installation of a private utility within the City's ROW. We placed a stop work order on the contractor and told him he needed to get a road opening permit from the City and an agreement with the City to allow their installation in the ROW.

Staff also drove into the subdivision and found many trees planted within the ROW of Frances Boulevard and Farm Field Circle. Permission was not obtained for these additional plantings.

The Developer has stated he thought he could plant them as long as the HOA maintained them. I reminded him that he need to get permission for these prior to installation.

In review of the plat, it does not contain any language related to these trees being the responsibility of the HOA.

The City has two options:

1. Order the trees removed and the electrical conduit removed from the ROW.
2. Enter into a Revocable Agreement Authorizing Occupancy of the Right of Way to allow the trees and the electrical conduit to remain. This outlines the responsibility of the HOA to maintain the trees and conduit and allows the City to remove them at no cost if needed in the future. It also states the City will not be responsible for any damage or repair of the trees or conduit.

UPDATE: The agreement has been updated to add the Landscaping Plan to it as an exhibit and expanded the language

requiring the HOA to maintain the landscaping/trees/conduit.

The Landscaping Plan includes Swan View Farms and Swan View Farms Addition #1.

The trees in Swan View Farms were located as part of our City Wide Tree Inventory by Wachtel Tree Science in 2022. The trees planted in Swan View Farms Addition #1 were not installed at the time of collection. If the trees are allowed to remain, the inventory of these trees should be required to be completed by the Developer at his expense and provided to the City.

FINANCIAL IMPACT:

RECOMMENDED MOTION:

Council either 1) order the trees and conduit removed from the City's ROW or 2) authorize the trees and conduit remain with the execution of the agreement and require the tree inventory to be updated.

ATTACHMENTS:

Description

Revocable Agreement

Exhibit B

	REVOCABLE AGREEMENT AUTHORIZING OCCUPANCY OF RIGHT-OF-WAY	
--	--	--

THIS AGREEMENT is made as of the 11th day of January, 2023 by and between BWC Investments, LLC on behalf of the Swan View Farms Homeowners Association (collectively “Owners”) and the City of Pewaukee (“City”).

WHEREAS, Owners hold title to certain real property located within the Swan View Farms and Swan View Farms Addition No. 1 in the City of Pewaukee, Waukesha County, Wisconsin, which is more particularly described on Exhibit A attached hereto which is hereby incorporated herein (the “Property”); and

WHEREAS, there exists a right of way in favor of the City, which was recorded as part of Swan View Farms and Swan View Farms Addition No. 1 Plats; and

WHEREAS, it is the desire of the Owners to install a conduit, electrical wires, electrical fixtures, and related facilities across the right of way to serve the islands;

WHEREAS, it is the desire of the Owners to install trees and landscaping within the public right of way in accordance with Exhibit B.

NOW, THEREFORE, at the request of the Owners, and in consideration of City permitting the conduit, electrical wires, electrical fixtures, trees and landscaping, and related facilities in accordance with Exhibit B placed within the right of way to be constructed and maintained within the right of way, the parties agree:

- (1) Owners acknowledge that the existence of said conduit, electrical wires, electrical fixtures, trees and landscaping, and related facilities placed within the right of way does not constitute a claim of adverse possession against the right of way of the City.
- (2) Owners acknowledge that City owns the subject right-of-way, reserves all rights under law related to the right-of-way, may, in its sole discretion, improve said right of way and in so doing, revoke Owner’s permissive use of the right-of-way at any time.

Owners agree that they will not be compensated for damage, destruction or removal of Owner’s conduit, electrical wires, electrical fixtures, trees and landscaping, and related facilities placed within the right of way due to any future road or utility maintenance or reconstruction activities or other private utilities permitted now or in the future within the right of way at any time.

- (3) Owners agree that in the event the City damages or destroys Owner’s conduit, electrical wires, electrical fixtures, trees and landscaping, and related facilities placed within the right of way or any part thereof in connection with the construction,

Name and Return Address

City of Pewaukee
Engineering Department
W240N3065 Pewaukee Road
Pewaukee, WI 53072

Parcel Identification Number (PIN)

PWC0871094
PWC0871095
PWC0871096

maintenance, or operation of public right of way or drainage located within the right of way, Owners agree that the City will not be responsible for the cost of repairs to, maintenance of, or replacement of the conduit, electrical wires, electrical fixtures, trees and landscaping, and related facilities placed within the right of way area.

- (4) Owners agree the location of the conduit, electrical fixtures, trees and landscaping, and related facilities must be approved, in writing, by the City Engineer. Owners acknowledge that City plowing operations may occur along or in the portion of the conduit, electrical wires, electrical fixtures, trees and landscaping, and related facilities within in the right of way to ensure snow storage and access. The City shall not be responsible for any damages to the conduit, electrical wires, electrical fixtures, trees and landscaping, and related facilities within the right of way associated with the plowing and maintenance operations.
- (5) Owners agree to locate the conduit and all private electrical connections within the right of way as required per Digger's Hotline regulations. The City will not be responsible for marking these locations now or in the future.
- (6) Owners agree to perform all maintenance on the conduit, electrical wires, electrical fixtures, trees and landscaping, and related facilities at no cost to the City. If maintenance or corrective action is required on any of the conduit, electrical wires, electrical fixtures, trees and landscaping, and related facilities, the Owners do not complete the work, and it is deemed a safety hazard, the City will complete the work and all costs associated with the work will be billed back to the Owners as a special charge on the end of year tax bill. The Owners waives the right to a public hearing regarding these special charges.

The Owners agree to keep a contact current with the City Engineering and Highway Departments to provide any notices of needed maintenance or corrective actions. If a contact is not provided or is outdated, the City will proceed with the work and special charge without additional notice to Owners.

- (7) Owners agree to obtain a permit from the City prior to replacement of any of the conduit, electrical wires, electrical fixtures, trees and landscaping, and related facilities.
- (8) This Agreement shall run with the land and will benefit and burden Owners and the City, and their respective successors and assigns.

IN WITNESS WHEREOF, owners have caused this Agreement to be executed as of the day and year above written.

OWNERS

BWC Investments LLC

STATE OF WISCONSIN)
) ss.
COUNTY OF WAUKESHA)

Personally came before me this _____ day of _____, 2023, the above named
_____ known to be the persons who executed the foregoing instrument
and acknowledged the same.

NOTARY PUBLIC,
Waukesha County
State of Wisconsin
Commission expires _____

CITY

Steve Bierce, Mayor

Attest: _____
Kelly Tarczewski, Clerk

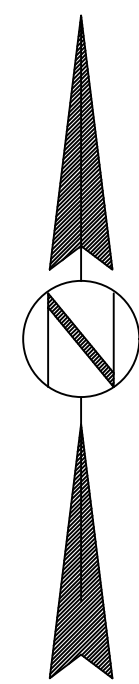
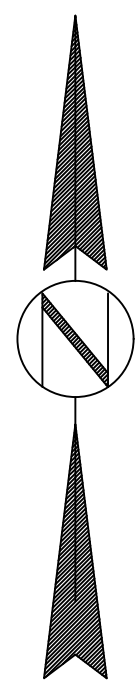
STATE OF WISCONSIN)
) ss.
COUNTY OF WAUKESHA)

Personally came before me this _____ day of _____, 2023, the above named
_____ known to be the persons who executed the foregoing instrument
and acknowledged the same.

NOTARY PUBLIC,
Waukesha County
State of Wisconsin
Commission expires _____

This instrument drafted by
Magdelene J. Wagner, Director of Public Works/City Engineer

Please return document to: City of Pewaukee
 ATTN: Engineering
 W240N3065 Pewaukee Road
 Pewaukee WI 53072



LANDSCAPING PLAN
SWAN VIEW FARMS SUBDIVISION
CITY OF PEWAUKEE, WI

DATE 12-20-22

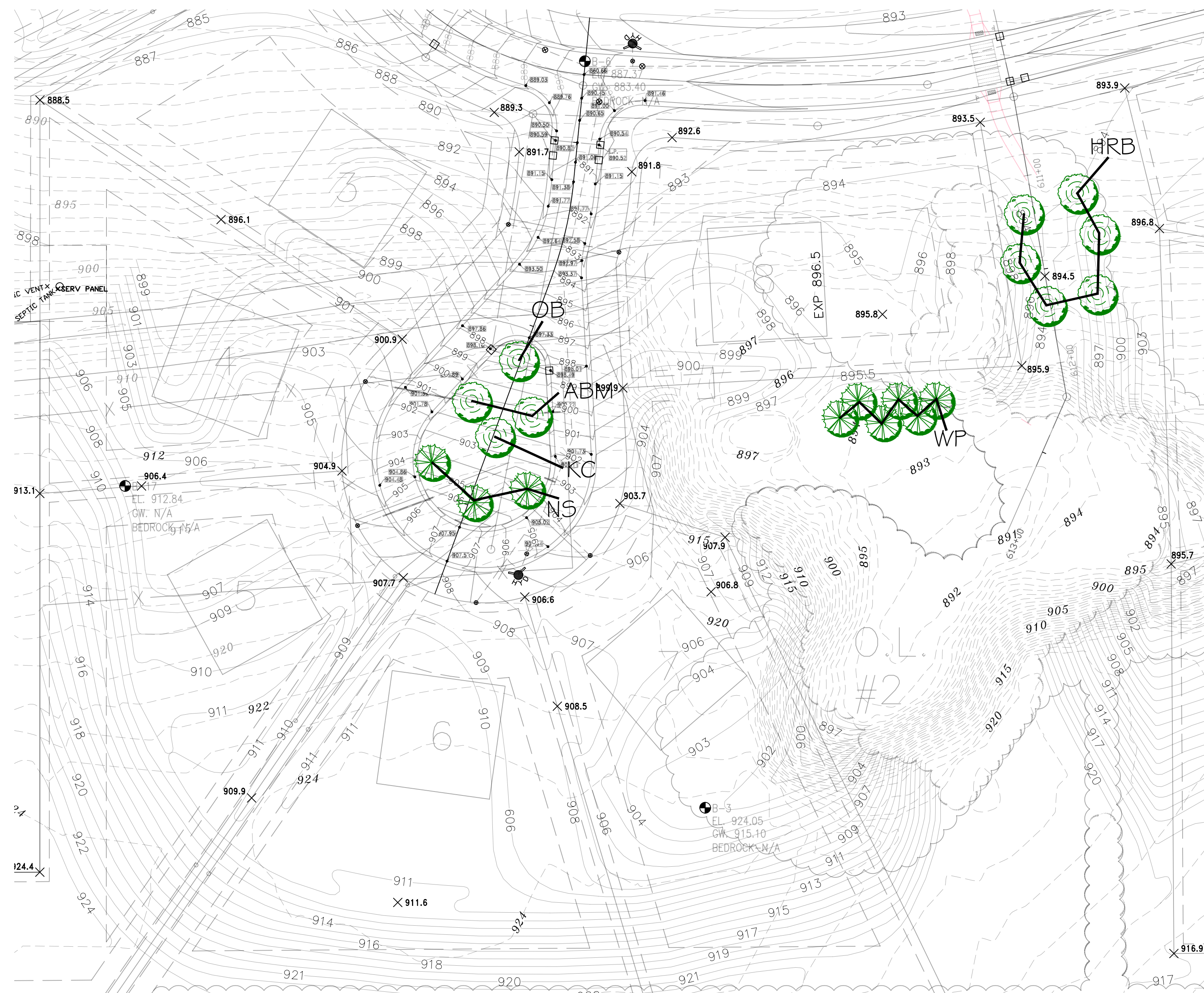
REVISIONS

|||

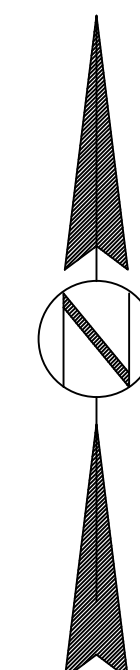
SHEET NUMBER

L-1

N8 W2520-L JOHNSON DR. WAUKESHA, WI 53186

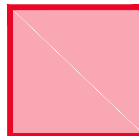


SWAN VIEW COURT LANDSCAPING
SCALE 1" = 40'



PLANT SCHEDULE

KEY	QTY.	NAME	SIZE
NS	35	NORWAY SPRUCE	10'-12'
WP	14	WHITE PINE	10'-12'
SWO	3	SWAMP WHITE OAK	4"
OB	3	OHIO BUCKEYE	5"-6"
KC	4	KENTUCKY COFFEE	5"-6"
RL	5	REDMOND LINDEN	5"-6"
ABM	8	AUTUMN BLAZE MAPLE	5"-6"
HRB	25	HERITAGE RIVER BIRCH	12'
WB	7	WHITESPIRE BIRCH	12'
ABP	27	AUTUMN BLAZE PEAR	4"
H	3	HACKBERRY	5"-6"
CSP	5	CLEVELAND SECRET PEAR	3"
PG	2	PRINCETON GINKO	1"
PE	12	PRINCETON ELMS	3"
TE	12	TRIUMPH ELMS	3"
ABM3	10	AUTUMN BLAZE MAPLES	3"

 3500 S.F. PLANTS, PERENIALS, GRASSES



N8 W2520-L JOHNSON DR. WAUKESHA, WI 53186



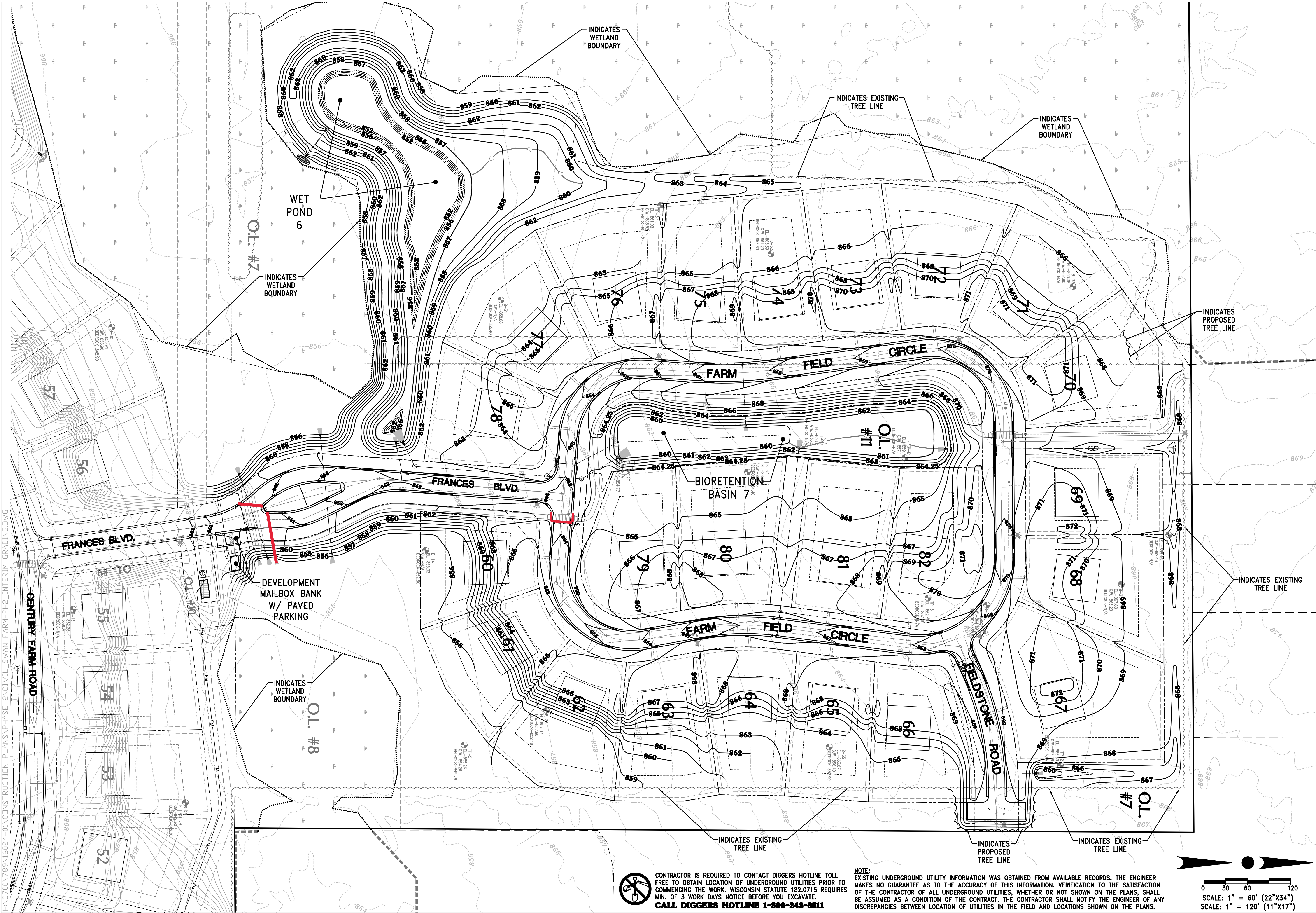
LANDSCAPING PLAN
SWAN VIEW FARMS SUBDIVISION
CITY OF PEWAUKEE, WI

DATE 12-20-22

REVISIONS

SHEET NUMBER

L-4

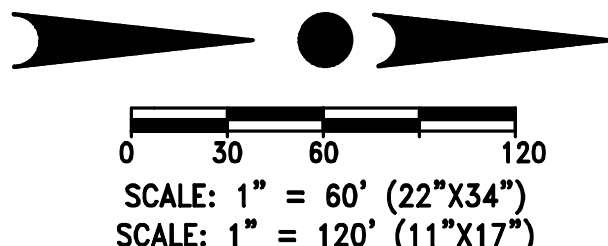


H:\C700\789\16024-01\CONSTRUCTION PLANS\PHASE 2\CIVIL_SWAN_FARM-PH2_INTERIM GRADING.DWG



CONTRACTOR IS REQUIRED TO CONTACT DIGGERS HOTLINE TOLL FREE TO OBTAIN LOCATION OF UNDERGROUND UTILITIES PRIOR TO COMMENCING THE WORK. WISCONSIN STATUTE 182.0715 REQUIRES MIN. OF 3 WORK DAYS NOTICE BEFORE YOU EXCAVATE.
CALL DIGGERS HOTLINE 1-800-242-8811

NOTE:
EXISTING UNDERGROUND UTILITY INFORMATION WAS OBTAINED FROM AVAILABLE RECORDS. THE ENGINEER MAKES NO GUARANTEE AS TO THE ACCURACY OF THIS INFORMATION. VERIFICATION TO THE SATISFACTION OF THE CONTRACTOR OF ALL UNDERGROUND UTILITIES, WHETHER OR NOT SHOWN ON THE PLANS, SHALL BE ASSUMED AS A CONDITION OF THE CONTRACT. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN LOCATION OF UTILITIES IN THE FIELD AND LOCATIONS SHOWN ON THE PLANS.



4100 N. CALHOUN RD
BROOKFIELD, WI 53005
PHONE: (262) 790-1480
FAX: (262) 790-1481
EMAIL: info@trioeng.com

PROJECT:
SWAN VIEW FARMS - PHASE 2
SINGLE FAMILY RESIDENTIAL SUBDIVISION
CITY OF PEWAUKEE, WISCONSIN
BY: BWC INVESTMENTS LLC
N8W22520 JOHNSON DR.
WAUKESHA, WI 53186

REVISION HISTORY	
DATE	DESCRIPTION
02/21/2020	INITIAL CIVIL SUBMITTAL
12/23/2020	PER CITY REVIEW
04/02/2021	PER CITY REVIEW
06/16/2021	UTILITY PLAN REVIEW
07/15/2021	PER CITY REVIEW
09/23/2021	PER CITY REVIEW
10/07/2021	PER AECOM REVIEW

DATE:
OCTOBER 07, 2021

JOB NUMBER:
16024

DESCRIPTION:
PROPOSED
OVERALL INTERIM
GRADING PLAN

SHEET
C1.0

**CITY OF PEWAUKEE
COMMON COUNCIL AGENDA ITEM 6.**

DATE: January 16, 2023

DEPARTMENT: Public Works

PROVIDED BY: Magdelene Wagner

SUBJECT:

Discussion and Possible Action to Install Snow Fencing on City Land (PWC 0934-021) Along Oak Street to Restrict Access to Pewaukee Lake for Erosion Concerns [Wagner]

BACKGROUND:

Residents along Oak Street have requested snow fencing be installed along the bay on the City owned land off Oak Street. They have reported recreational vehicles and trucks using this land to access Pewaukee Lake. In addition, they have seen the recreational vehicles doing tricks off the culvert end section. All the access is contributing to the erosion of the bank of this bay area.

The residents have requested the City install the snow fencing to limit the access to a single area to reduce the potential erosion and safety concerns.

Note: Staff has a future project in this area to do a bank stabilization project, but have not budgeted in 2023 to work on this. We are looking to add it in the 2024 budget.

FINANCIAL IMPACT:

It is estimated this will require 250' of snow fencing and posts. Estimated cost of materials is \$400.

RECOMMENDED MOTION:

ATTACHMENTS:

Description

Location Map



0 39.29 Feet

The information and depictions herein are for informational purposes and Waukesha County specifically disclaims accuracy in this reproduction and specifically admonishes and advises that if specific and precise accuracy is required, the same should be determined by procurement of certified maps, surveys, plats, Flood Insurance Studies, or other official means. Waukesha County will not be responsible for any damages which result from third party use of the information and depictions herein or for use which ignores this warning.

Notes:

Printed: 1/11/2023



**CITY OF PEWAUKEE
COMMON COUNCIL AGENDA ITEM •**

DATE: January 16, 2023

DEPARTMENT: Fire Department

PROVIDED BY:

SUBJECT:

§19.85(1)(e): Deliberating or negotiating the purchasing of public properties, the investing of public funds or conducting other specified public business, where competitive or bargaining reasons require a closed session. In this instance the Closed Session is specifically related to the contract with the Village of Pewaukee to provide fire and rescue services.

BACKGROUND:

FINANCIAL IMPACT:

RECOMMENDED MOTION: