

Prepared For:

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Trees Located at:

Hazeltine Boulevard and Highway 41, Chaska MN

Date of Inspection: September 19, 2017

Number of Protected Trees: 4

Assignment:

Recommend mitigation options to reduce impacts to a less than significant level and identify construction guidelines to be followed through all phases of the project.

Google Site Map with Tree Numbers:



Tree 201

- ❖ **Species:** Bur oak (*Quercus macrocarpa*)
- ❖ **Size:** 32 inches trunk diameter at 4.5 feet from the ground (DBH)
- ❖ **Height:** 40 feet
- ❖ **Branch spread:** 60 feet
- ❖ **Mature Height and Canopy Spread:** 70-100 feet high with similar spread
- ❖ **Age (young, semi-mature, mature, senescent):** mature
- ❖ **Estimated age:** 160 years
- ❖ **Typical age of mortality:** 300 years
- ❖ **Condition rating (see Table 1):** 4; chlorosis, canopy tip dieback, large pruning wounds
- ❖ **Comments:** Bur oak is considered *Tolerant* to root severance, *Intermediate* to compaction, *Low* to flooding

Tree 202

- ❖ **Species:** Bur oak (*Quercus macrocarpa*)
- ❖ **Size:** 29 inches trunk diameter at 4.5 feet from the ground (DBH)
- ❖ **Height:** 50 feet
- ❖ **Branch spread:** 60 feet
- ❖ **Mature Height and Canopy Spread:** 70-100 feet high with similar spread
- ❖ **Age (young, semi-mature, mature, senescent):** mature
- ❖ **Estimated age:** 145 years
- ❖ **Typical age of mortality:** 300 years
- ❖ **Condition rating (see Table 1):** 4; chlorosis, canopy tip dieback, large pruning wounds
- ❖ **Comments:** Bur oak is considered *Tolerant* to root severance, *Intermediate* to compaction, *Low* to flooding

Tree 203

- ❖ **Species:** Bur oak (*Quercus macrocarpa*)
- ❖ **Size:** 39.7 inches trunk diameter at 4.5 feet from the ground (DBH)
- ❖ **Height:** 50 feet
- ❖ **Branch spread:** 60 feet
- ❖ **Mature Height and Canopy Spread:** 70-100 feet high with similar spread
- ❖ **Age (young, semi-mature, mature, senescent):** mature
- ❖ **Estimated age:** 195 years
- ❖ **Typical age of mortality:** 300 years
- ❖ **Condition rating (see Table 1):** 4; chlorosis, canopy tip dieback, large pruning wounds
- ❖ **Comments:** Bur oak is considered *Tolerant* to root severance, *Intermediate* to compaction, *Low* to flooding

Tree 204

- ❖ **Species:** Bur oak (*Quercus macrocarpa*)
- ❖ **Size:** 39 inches trunk diameter at 4.5 feet from the ground (DBH)
- ❖ **Height:** 56 feet
- ❖ **Branch spread:** 30 feet
- ❖ **Mature Height and Canopy Spread:** 70-100 feet high with similar spread
- ❖ **Age (young, semi-mature, mature, senescent):** mature
- ❖ **Estimated age:** 195 years
- ❖ **Typical age of mortality:** 300 years
- ❖ **Condition rating (see Table 1):** 3; large pruning wounds, one-sided directional pruning away from power lines, missing canopy
- ❖ **Comments:** Bur oak is considered *Tolerant* to root severance, *Intermediate* to compaction, *Low* to flooding

Before Construction Begins**1. Fall 2017**

- **Iron injection**

MIN-Jet Iron with Manganese. The purpose of this is to increase photosynthesis and improve overall health.

- **Plant Growth Regulator (Cambistat®, Short Stop®)**

This is an application of paclobutrazol hormone (active ingredient) which encourages trees to produce new roots and maintain health during construction.

2. Spring 2018

- **Ima-Jet insecticide**

To protect from Two-lined chestnut borer which may affect trees weakened by stress factors.

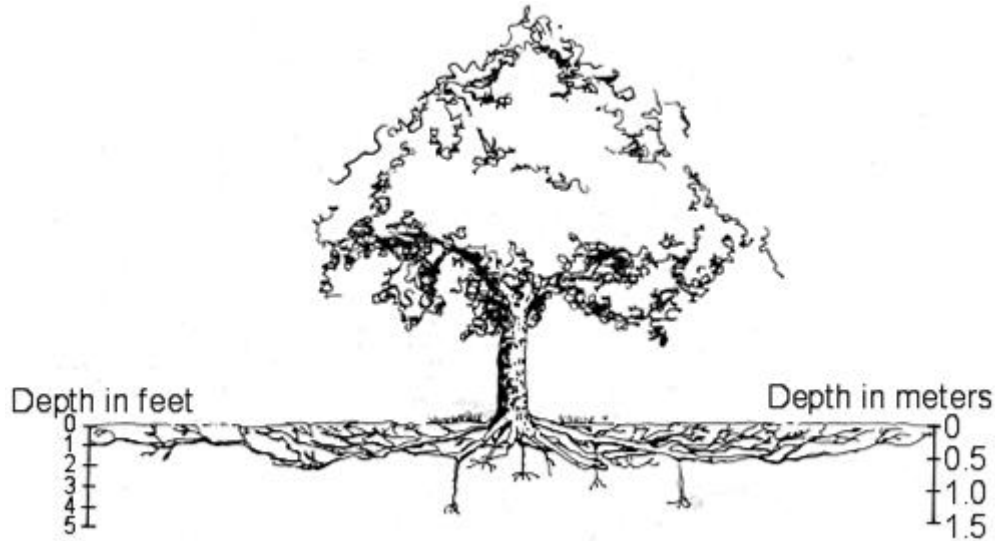
- **Propizol fungicide**

To protect against possible oak wilt infection. This allows construction to proceed during high oak wilt season, which is March-July.

3. Determining the Tree Protection Zone (TPZ)

- See Site Drawings for TPZ

Tree roots develop and survive where there is adequate oxygen and moisture. Most active tree roots are in the top 3 feet of soil; the majority are in the top 12 inches. Roots normally grow outward to about three times the branch spread. Only 50 percent of the tree's root system occurs between the trunk and the dripline.



The *minimum* distance from the trunk to make a one-sided linear cut is three times the trunk diameter. Significant risk of catastrophic tree failure exists if structural roots within this given radius are destroyed or severely damaged. Cuts at this distance can severely compromise tree health.

The *preferred* distance is five times the trunk diameter.

The *ideal* distance is one foot per diameter inch. Survival is close to 100% when this amount of roots remain undisturbed. This may not be practical as the building will most likely be located in this area.

Tree #	DBH, inches	5 x DBH, inches	Linear cut distance to trunk, feet
201	32	160	14
203	39.7	198.5	17
204	39	195	17

In the drawing, please note that the other tree protection dimensions, not the linear cut distance, are only applicable where the retaining wall is modified. This appears as ‘boxes’ around the tree. If the existing retaining wall falls inside the projected ‘boxed’ area, this is allowed because there are no roots there.

The linear cut distances provided in the chart represents the ideal scenario. These distances should be used as a design guideline and any encroachment into this area should be reviewed to determine the impacts to the existing tree.

4. Root Severance

Using a vibratory plow, sever the root systems as indicated on site drawings. Severance by a vibratory plow ensures roots are cut clean, with no tearing or pulling that could happen with a backhoe or other construction equipment.

5. Protective Fencing for Tree Trunks

Fencing may be placed around each trunk according to the following picture. Recommended, but left to the tree owner. Example:



7. TPZ Fencing- Chain Link

Tree fencing shall be erected before demolition, grading or construction begins and remain in place until all work is completed. Refer to site drawings for location of chain link fencing. Dimensions and layout shown are conceptual and that the actual locations shown on the engineered drawings will be reviewed for compatibility. Fencing should be 5' -6' feet high.

Example:



8. TPZ Fencing- Orange Plastic

Erected prior to any construction or demolition works, delivery of site accommodation or materials and remain for the duration of construction works. Refer to site drawings for location of orange fencing.

9. Signage on Fencing

Multiple warning signs shall be prominently displayed on fencing. The signs shall be a minimum of 8.5 x 11-inches and clearly state:

WARNING - *Tree Protection Zone*
KEEP OUT!

ALL TREES ENCLOSED BY THIS FENCE ARE PROTECTED AND ARE THE SUBJECTS OF A TREE PRESERVATION ORDER.

During Construction

1. Activities prohibited within the TPZ include:

- Dumping of poisonous materials on or around trees and roots. Poisonous materials include, but are not limited to, paint, petroleum products, concrete or stucco mix, dirty water or any other material which may be deleterious to tree health.
- The use of tree trunks as a winch support, anchorage, as a temporary power pole, sign posts or other similar function.
- Entering the TPZ area.

2. Dust

Spray trunk, limbs and foliage with water to remove accumulated construction dust.

3. Removal of Tree Protection Measures

Fencing and trunk guards can be removed once all work is completed.

4. Permanently discontinue irrigation of turf grass under oaks.

5. Avoid installing gardens, planting trees or landscaping in general under oaks.

Signatures:

The following persons agree to abide by the conditions outlined in this Tree Protection Plan and all of its attachments.

Property Owner's Printed Name & Signature:

Date Signed:

Site Agent Printed Name & Signature:

Date Signed:

General Contractor's Printed Name & Signature:

Date Signed:

Project Arborist Printed Name & Signature:

Date Signed:

References:

1. American National Standards Institute (ANSI). *Performance Specifications of the Pruning of Trees Shrubs & Other Woody Shrubs*. ANSI A-300. New York: American National Standards Institute (ANSI), 1998.

2. Clark, J. and Matheny, N. 1998. Trees and Development. *A Technical Guide to Preserving Trees during Land Development*. International Society of Arboriculture Champaign, IL.

3. Coder, K. D. 2009. *Root Strength and Tree Anchorage*. Warnell School of Forestry and Natural Resources, University of Georgia.

4. French, D. and Juzwik, J. 2002. *Oak Wilt in Minnesota*. University of Minnesota Extension.

5. Growth Factor Worksheet

http://files.dnr.state.mn.us/education_safety/education/plt/activity_sheets/growthfactorworksheet.pdf

6. Mississippi State University Extension Service. *Preserving Trees in Construction Sites*.

7. Smiley, T., B. Fraedrich, N. Hindrickson. 2002. *Tree Risk Management*. Bartlett Tree Research Laboratories.

Table 1

Condition rating	Overall vigor	Canopy density	Amount of deadwood	History of failure	Pests	Extent of decay
1	Severe decline	< 20%	Large; major scaffold branches	More than one scaffold	Infested	Major-conks and cavities
2	Declining	20-60%	Twig and branch dieback	Scaffold branches	Infestation of significant pests	One to a few conks; small cavities
3	Low	60-90%	Small twigs	Small branches	Minor	Present at pruning wounds
4	Good	90-100%	Little or none	None	Minor	Present at pruning wounds
5	Excellent	100%	None	None	None, or insignificant	Absent

