CITY OF GREENSBORO

COLLEGE HILL HISTORIC DISTRICT

TREE INVENTORY

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INTRODUCTION

William H. Lock & Associates, Inc. was asked to perform a Tree Inventory for the College Hill Historical District in Greensboro, NC. We were directed to inventory and locate the trees located within the perimeter of the Historic District as indicated on maps provided by the City of Greensboro.

The purpose of this report is to provide an inventory of the trees showing:

1- Assigned tree number,
2- Common name,
3- Scientific name,
4- Diameter breast height,
5- Condition
6- Hazard tree rating
7- Conflicts the tree causes
8- Geographical location.

The tree inventory provides a summary of the condition of the trees to help minimize the risks associated with older or declining trees and helps to predict current and future needs for tree maintenance and tree removal. Overall tree health and appearance should be improved throughout the neighborhood.

Due to landowner request several properties were not inventoried. These properties include:

710 Walker Avenue
804 Rankin Place
806 Rankin Place
117 S. Mendenhall Street
127 S. Mendenhall Street
112 Odell Street
317 S. Tate Street
319 S. Tate Street
913 Spring Garden Street

PROCEDURES FOR TREE INVENTORY

The various trees were inventoried during September and October of 2013. The objectives of the inventory were to:

- number and define each tree ≥ 4" Diameter Breast Height and other smaller obvious significant landscape trees
- determine the common and scientific name of each tree, if possible
- make an assessment of the health and size class of each tree
- determine a hazard tree rating for each mature tree
- note possible conflicts with site issues
- provide a GPS location in digital format for future GIS integration.

The following data was collected:

1) Assigned number – Each tree or significant landscape plant was assigned a number for reference purposes. This number is indexed on the listing sheets and the digital format as ID_.

2) Common and scientific name – Each tree/plant was identified by its common and scientific name. Some species were listed by family or genus only if exact identification was not possible. There are some trees that were not able to be identified.

3) Diameter breast height (DBH) – Diameters were measured in inches with a standard diameter tape at 4.5 feet above the mean ground level. If the stem forked below DBH, individual measurements were taken for each main trunk. Caliper measurements were taken for trees and landscape significant plants where DBH was not feasible due to tree size or structure. Caliper estimates are designated with a "c" after the value. Trees that have many stems were labeled as "multi".

4) Health – This classification was identified in the following categories: Good, Fair, Poor, and Dead. This is a visual inspection of the health of the tree from the ground.

5) Size Class - Trees were classified as Over-mature, Mature, Intermediate, Juvenile, or Sapling size.

6) Hazard Tree Rating - Mature trees were given a hazard tree rating. Hazard tree ratings range from 3 (low hazard risk) – 12 (highest hazard risk). The hazard rating is calculated from the sum of the following three criteria:

Potential for Failure	Part Size	Target
1 - Low	1- <6"	1- Occasional
2 - Medium	2- 6"-18"	2- Intermittent
3 - High	3-18"-30"	3- Frequent
4- Severe	4- >30"	4- Constant

7) Conflicts - Any conflicts the tree caused were noted. Examples of a conflict would be utility lines, sidewalks, vehicular travel, etc.

8) GPS address – Trees/plants were located using a Trimble Geo-XT sub-meter unit. A specific northing/easting (x, y) can be printed for each item. This information is included on the enclosed disk to be used with ArcGIS.

MANAGEMENT OBJECTIVES FOR TREES

The management objectives for the trees in the College Hill Historical District are to:

- maintain and improve the health and vigor of the existing trees within the neighborhood
- reduce the risks associated with older or declining trees
- minimize the potential liability of hazard trees with proper care and/or removal
- maximize the neighborhood's aesthetics by maintaining a healthy and diverse tree population

Specific objectives:

High Hazard Trees- Identification and treatment of hazardous tree conditions should be a priority. A tree with a high hazard rating is one that not only has a structural defect but a target that could cause personal or property damage in the case of a failure. Situations should be assessed for possible immediate corrective measures. A tree in a forested area with a large broken limb (hanger) is not as great a risk as the same tree along a well-traveled sidewalk in the city.

Pruning – Trees should be pruned periodically to preserve their health, beauty, and appearance. Proper pruning can reduce damage to human life, structures, and private property. Pruning basically regulates and controls growth. Established landscape trees should be pruned when necessary to correct structural defects and possible storm damage. All pruning should be conducted according to the latest American National Standards Institute (ANSI) recommendations for tree care.

Maintenance – Fertilization and Pest Management should be incorporated into any long-term management plan. *Fertilization* programs should be developed annually based on soil tests, specific species requirements, and any specific plant conditions. Specimen trees can be given priority as should trees with obvious problems or deficiencies. Please see the General Fertilization Information later in the report.

Pest Management should be accomplished utilizing cultural, biological, and chemical treatments. This Integrated Pest Management system provides a very successful identification and treatment program using a wide scale approach. Situations and problems are ranked and treated according to their importance.

Inventory Summary

A total of 3,090 trees and/or plants of significant landscape value were evaluated during this inventory. Overall the trees in the College Hill Historic District are in Good condition. Almost 83 % (2,564) of the trees were classified as being in Good condition. Less than 6% (171) of the trees were classified as being in Poor or Dead condition.

Condition	#Trees	
Good	2564	83%
Fair	354	11%
Poor	141	5%
Dead	30	1%
Total	3090	

A total of 84 different species were inventoried in this project. There were 8 trees that were not able to be identified. The majority of the species inventoried are native to this area although some ornamental and exotics were noted. There were 32 Ailanthus altissima (Tree of Heaven) trees that were identified. These trees are exotic invasive species and measures should be taken to remove these trees. The 30 most occurring tree species are in the table below. A complete list of tree species identified can be found at the end of this report.

Crepe Myrtle	380	12%
Elm	226	7%
Willow Oak	224	7%
Hackberry	222	7%
Sugar Maple	178	6%
Black Walnut	154	5%
Pecan	149	5%
Dogwood	119	4%
Leyland Cypress	119	4%
Red Maple	112	4%
Mulberry	101	3%
Southern Magnolia	79	3%
Black Cherry	74	2%
Bradford Pear	69	2%
Silver Maple	68	2%

Holly	61	2%
Ornamental Cherry	57	2%
Southern Red Oak	52	2%
Post Oak	37	1%
Ash	36	1%
Catalpa	33	1%
Tree of Heaven	32	1%
Redbud	31	1%
Zelkova	28	1%
River Birch	25	1%
Scarlet Oak	22	1%
White Oak	22	1%
Deodar Cedar	21	1%
White Pine	21	1%
Japanese Maple	20	1%

A size classification was given to each tree. The size classifications were assigned after a visual inspection of the tree. This may or may not indicate the true age of the tree. It represents the size of the tree for its given species. Almost half of the trees are considered to be mature or over-mature. Only 1% of the trees are of sapling size or newly planted.

Size Class	# Trees	
Sapling	18	1%
Juvenile	550	18%
Intermediate	1011	33%
Mature	1405	45%
Over Mature	106	3%
Total	3090	

Mature tree species were given an ISA hazard tree rating. Trees that are not normally associated with being a hazard like dogwoods, Leyland cypress, etc. were not given a hazard rating even if they are in the mature size class. The hazard tree rating number is determined from three criteria. The first is the potential that a part of the tree will fail, the second is the size of the part that will fail, and the third is frequency that there will be a target when the tree fails. The higher the hazard rating, the higher the potential for property and/or personal damage or injury. It is important to note that just because a tree has a high rating doesn't mean that the tree will fail. It means that when it does fail it has a greater chance at causing damage. Trees that are immediately adjacent to a house inherently have a higher hazard rating than trees that are in heavily wooded areas because the potential to cause damage is greater when a tree is next to a house.

Hazard Rating	# Trees	
3	382	34%
4	148	13%
5	116	10%
6	264	24%
7	97	9%
8	59	5%
9	32	3%
10	7	1%
11	8	1%
12	2	0%
Total	1115	

Trees that exist in urban settings often have conflicts associated with them. These conflicts include, but are not limited to, utility lines, sidewalks, houses and buildings, pedestrian traffic, and vehicular traffic. Approximately 17% of the trees inventoried had some type of conflict. Most of the conflicts involved utility lines (power and phone) or buildings.

Conflicts		
Utility Lines	347	11%
Sidewalk	20	1%
Pedestrian Travel	13	0%
Vehicular Travel	9	0%
Other	144	5%
None	2557	83%
Total	3090	

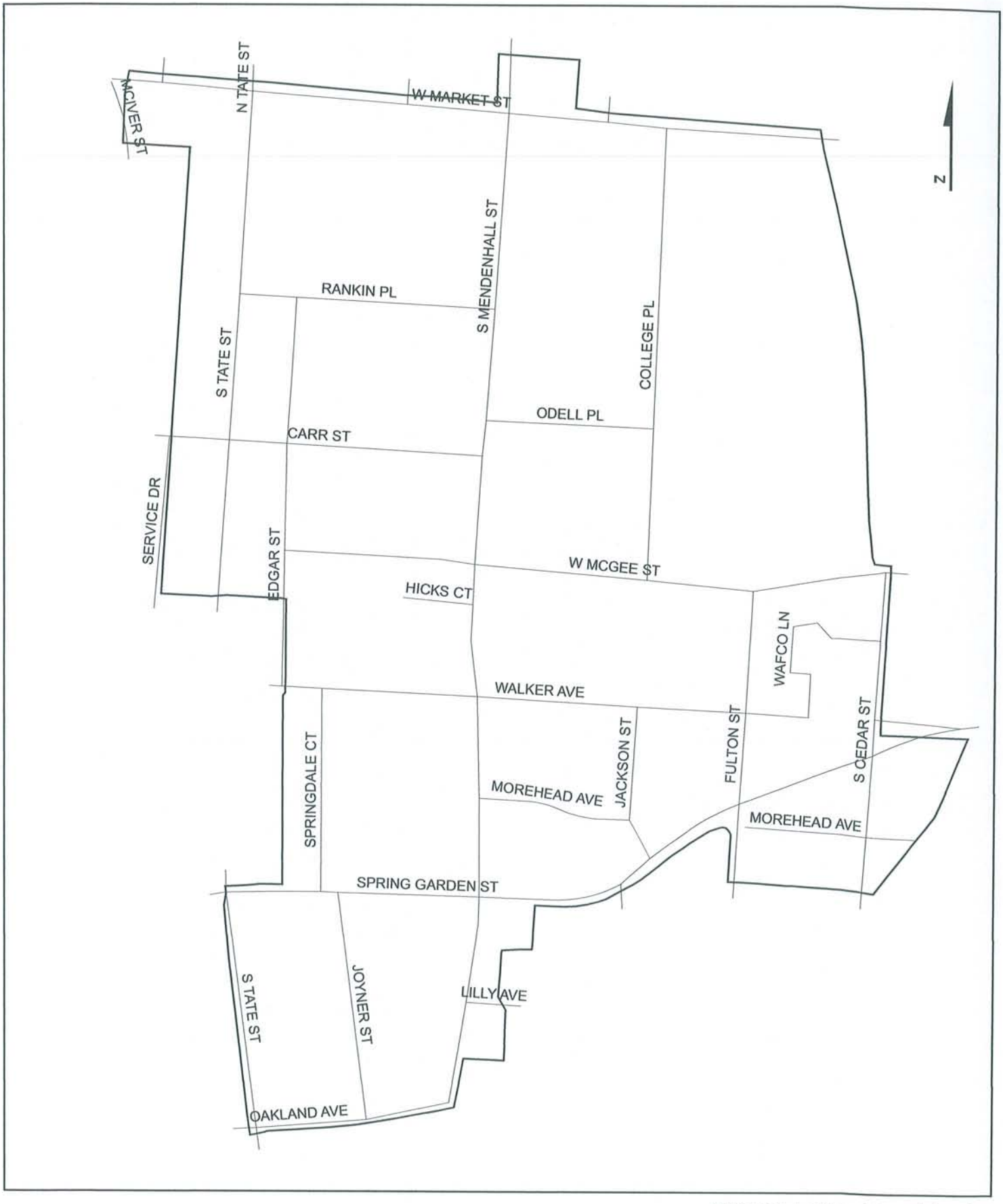
New Planting Sites

No new planting sites were identified. The density of the existing canopy coupled with the proximity to houses, buildings, utility lines, and other infrastructure make for planting new canopy trees extremely difficult. Trees can be planted to replace dead trees and when damaged trees are removed.

Exotic Invasive Species

There were 32 Ailanthus altissima trees that were inventoried. These trees are considered to be exotic and invasive trees and should be removed. Bamboo was present in a lot of the backyards throughout the neighborhood. There are also a lot of trees that are being strangled by English ivy, wisteria, and other vines. Measures should be taken to remove the vines from these trees. Trees that have vines present are noted in the comments section for each tree.

College Hill Tree Inventory
College Hill Historical District



1 inch equals 400 feet

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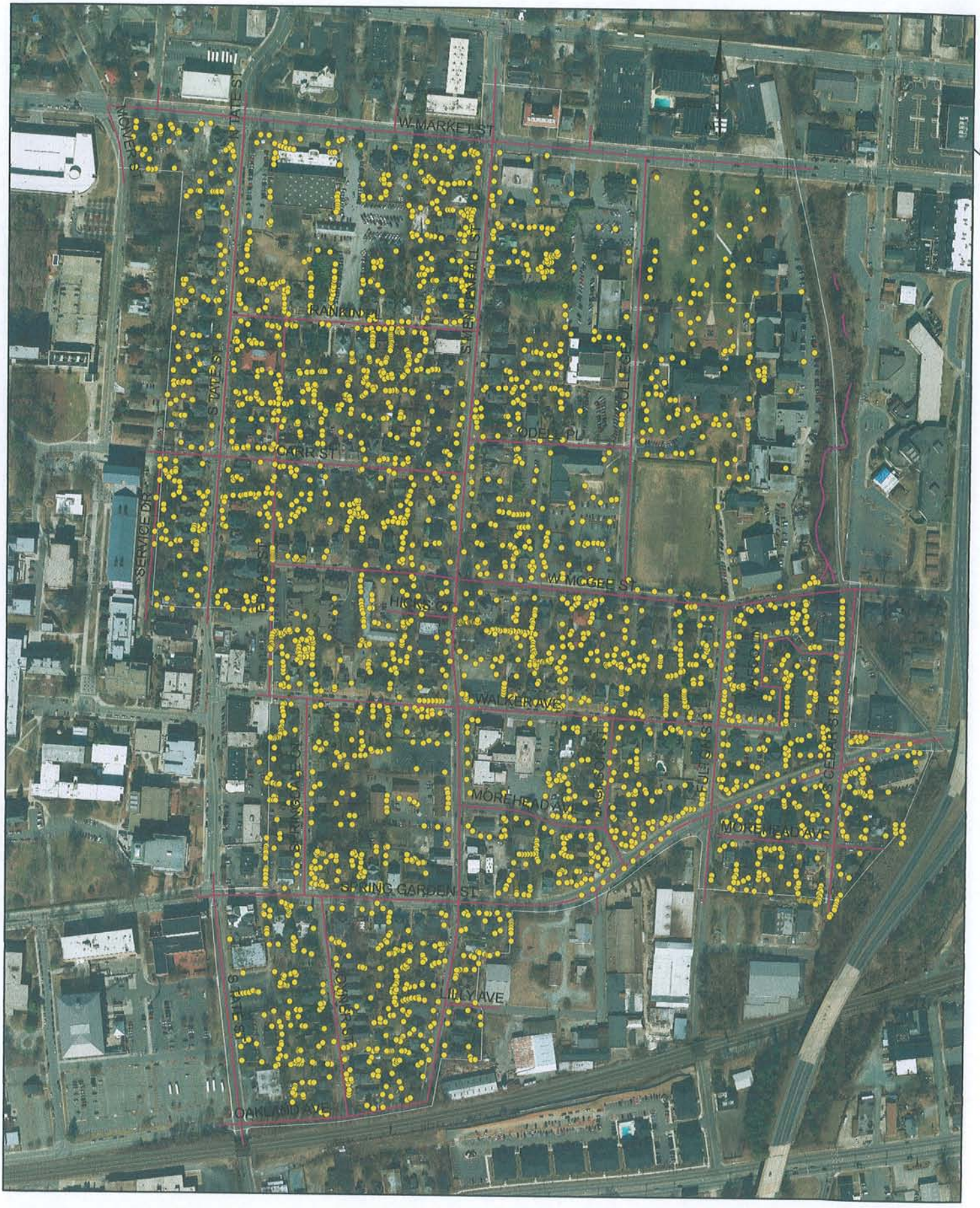

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GENERAL PRUNING INFORMATION

Pruning controls the growth, structure, and health of existing trees, both young and old. Young trees are pruned to facilitate strong branches to encourage future growth. Older trees are pruned to promote energy production and appearance. Mature trees are thinned to remove less significant branches and to promote the stronger limbs. Any pruning should conform to the American National Standards Institute (ANSI) standards.

Pruning is also used to reduce the risks associated with hazardous conditions. Removing the deadwood and damaged branches within trees improves the safety of the surrounding area. Thinning helps to reduce crowns to minimize potential storm damage.

All of the trees should be placed on some type of pruning schedule if budgets allow. If budgets are limited, develop a ranking system based on hazard potential and tree removals, newly established young trees, specimen trees in key locations, and mature trees for maintenance.

NOTE: Topping is the practice of cutting back and removing the main branches of a tree in a severe pattern. The branches are most often cut between the existing limbs. In some cases, almost all of the foliage is removed which reduces the energy production of the tree, removes the energy reserves, and creates an increased wound area which increases wood decay. Topping is not a recommended practice and should not be performed. Crown reduction and thinning may be used to accomplish a more acceptable form.

GENERAL FERTILIZATION INFORMATION

The purpose of fertilizing trees and plants is to maintain vigor by promoting health and growth. It also assists the plant in overcoming the adverse effects of insects, diseases and possible mineral deficiencies.

Fertilization on a periodic basis is preferred, generally a 1-3 year rotation if budgets allow. Areas should be identified for a long-term rotational treatment. Soil samples should be taken and analyzed for nutrient and pH levels. Specific recommendations can be made from these test reports based on specific species requirements. If budgets are limited, develop a ranking system for treatments. Consider deficiency and declining plants, key location or specimen plants, and newly established young plants.

The methods of application include surface, drilled holes, and liquid injection. Autumn fertilization helps promote root growth. Mid to late summer fertilization is best used for correcting mineral deficiencies. According to one leading tree expert company (Bartlett), general fertilizer applications should be injected into the soil using an aqueous solution. This requires specialized equipment with knowledgeable operators. The solution should contain approximately 3 times as much nitrogen as phosphorus and potassium by weight, or a 3:1:1 ration. An example of a suitable analysis would be 18-6-6 or 12-4-4. Slow release nitrogen should make up the bulk of the nitrogen portion.

One rule of thumb is to apply 0.50 lbs. of nitrogen per inch of trunk diameter. Another method is to estimate the soil surface area beneath the crown of a particular tree and apply 6 lbs. of nitrogen per 1,000 sq. ft. of soil surface. Note that this makes more sense when dealing with trees in open or lawn conditions. When street surface and sidewalk areas occupy some of the surface area, specific conditions need to be assessed before applications can be made. Note that specific fertilization recommendations should be made after careful analysis of the soil test reports.

REPORT DISCLAIMERS

TREE AND PLANT DESIGNATION – The trees and significant landscape plants data represents the information on the day of measurement. Factors could have happened beyond our control which may have altered some of the information after its collection.

GENERAL TREE IDENTIFICATION AND MEASUREMENTS – Trees and significant landscape plants were identified and measured to the best of our ability but are not guaranteed. Some plants were listed as "unidentified". Some species are very difficult to identify due to cross breeding and the many cultivars available.

GPS - All locations are reasonably accurate but are not survey grade accuracy. Satellite availability, tree canopy, structure locations, and multi-path interference all contribute to the accuracy of any measurement and therefore cannot be guaranteed.

HAZARD TREE IDENTIFICATION – All identified trees and/or plants were inspected from the ground only. Trees inherently pose a certain degree of hazard and risk from breakage, failure or other causes and conditions. Recommendations that are made by William H. Lock & Associates, Inc. are intended to minimize or reduce hazardous conditions that may be associated with trees. However, there is and there can be no guarantee or certainty that efforts to correct unsafe conditions will prevent breakage or failure of a tree. Our recommendations should reduce the risk of tree failure but they cannot eliminate such risks, especially in the event of a storm or any other act of God. Some hazardous conditions in landscapes are apparent while others require detailed inspection and evaluation. While a detailed inspection and evaluation should and normally does result in the detection of potentially hazardous conditions, there can be no guarantee or certainty that all hazardous conditions will be detected.

NOTE: When this contract was initiated, instructions included the identification of "hazard" trees as a means of tree risk assessment. This report was prepared using the ISA Tree Hazard Evaluation Form which utilizes a numbering system. The International Society of Arboriculture is in the process of changing this assessment system from a numbering format to a wording system utilizing a Basic Tree Risk Assessment Form.

SUMMARY VALUES – All summaries and values were derived from various spreadsheets and number inventories. Some values and columns do not add exactly due to possible computer "rounding".

APPENDIX

IPM (Integrated Pest Management) For Landscape Plans. Donald C. Booth, Bartlett Tree Technical Report.

Newly Planted Trees. Bartlett Tree Plant Health Care Program.

Managing Young Trees. Bartlett Tree Plant Health Care Program.

Young Tree Pruning. Bruce R. Fraedrich, Bartlett Tree Plant Health Care Program.

Young Established Trees. Bartlett Tree Plant Health Care Program.

Mature Trees. Bartlett Tree Plant Health Care Program.

Managing Mature Trees. Bruce R. Fraedrich, Bartlett Tree Technical Report.

Maintenance Pruning Standard: A Simplified View. E. Thomas Smiley and Bruce R. Fraedrich, Bartlett Tree Technical Report.

Girdling Roots. Bruce R. Fraedrich, Bartlett Tree Technical Report.