Article 8: Tree Preservation

Section 1: Purpose

(a) The purpose of this ordinance is to cultivate and encourage a high level of tree preservation, to promote the general provisions within this ordinance, and to develop detailed provisions within the administrative guidelines in order to implement the regulations set forth to preserve, maintain, and replant trees within the City of Johns Creek, Georgia. The intent of the Ordinance and Administrative Guidelines is to provide standards for the preservation of trees as part of the land development, building construction and timber harvest processes. It is not the intent of this ordinance to regulate individual properties where activities do not require a land disturbance, building construction or timber harvest permit.

(b) Benefits to citizens derived from tree protection and replanting include:

(i) Improved control of soil erosion.
(ii) Moderation of storm water runoff and improved water quality.
(iii) Interception of airborne particulate matter and the reduction of some air pollutants.
(iv) Enhanced habitat for desirable wildlife.
(v) Reduction of noise and glare.
(vi) Climate moderation.

(vii) Aesthetics and scenic amenity.
(viii) Increased property value.

Section 2: Authority and Applicability

(a) The Administrative Guidelines referenced in this Article are hereby adopted by the City of Johns Creek, copies have been, and are now on file in the office of the Clerk of the City of Johns Creek, and the same are incorporated herein as if set out in full, and the provisions of the same shall be controlling.

(b) Terms and provisions of the Tree Preservation Ordinance and the Administrative Guidelines established herein, shall apply to all activity which requires the issuance of a land disturbance permit on any real property within the City of Johns Creek. No land disturbance permit shall be issued by the City of Johns Creek Community Development Department or any successor to that Department, without it being determined that the proposed development is in conformance with the provisions of these regulations.

(c) The terms and provisions of these regulations shall also apply to construction of new single family detached and duplex dwellings, including additions, renovations and/or alterations to existing single family detached and duplex dwellings.

(d) The terms and provisions of these regulations shall also apply to timber harvesting activities.

Section 3: Definitions

All words in these standards have their customary dictionary definitions except as specifically defined herein. The words “shall” and “must” are mandatory, and the words “may” and “should” are permissive.

Administrative Guidelines: Those certain guidelines, including any Appendices, existing or as future amended, incorporated by reference into the Tree Preservation Ordinance of the City of Johns Creek, Code of

Johns Creek, Georgia, Article 8, et. seq., which have been adopted by the City Council of the City of Johns Creek from time to time to provide standards for the protection, preservation, and replacement of trees, and which are regulated and enforced by the City Arborist in conjunction with the Department of Community Development or its designated agent(s) through development and construction permits and processes. Copies of the same are kept on file in the office of the Clerk of the City of Johns Creek and available for public inspection during business hours.

Agent(s), designated or authorized: an individual or entity authorized to administer and enforce the standards set forth in the City of Johns Creek Tree Preservation Ordinance and Administrative Guidelines.

Buildable Area: The portion of a parcel of land where a building may be located and which shall contain enough square footage to meet the minimum required by the zoning district. That portion which is not located in the minimum setbacks, utility corridors, driveways, slopes to build streets, tree save areas, landscape strips, specimen tree areas, state water buffer, tributary buffers, zoning buffers, wetlands, storm water and sanitary sewer easements.

Buffer:

(a) State Waters Buffer: An area along the course of any State waters to be maintained in an undisturbed and natural condition.

(b) Tributary Buffer: A protection area adjoining the tributaries of the Chattahoochee River. Tributary buffer specifications are contained in Part D. of each prospective land use section of the City of Johns Creek Tree Preservation Ordinance and Administrative Guidelines.

(c) Zoning Buffer: A natural undisturbed portion of a lot, except for approved access and utility crossings, which is set aside to achieve a visual barrier between the use on the lot and adjacent lots and/or uses. Buffer is achieved with natural vegetation and must be replanted subject to the approval of the Director of the Community Development Department or his/her designated agent(s) when sparsely vegetated. Cleaning of undergrowth from a buffer is prohibited except when accomplished under the supervision of the Director of the Community Development Department or his/her designee.

Caliper: The standard for trunk measurements of nursery stocks. Caliper of the trunk shall be taken 6 inches above the ground for up to and including 4-inch caliper size and 12 inches above the ground for larger sizes.

Cambium: Tissue within the woody portion of trees and shrubs which gives rise to the woody water and nutrient conducting system and the energy substrate transport system in trees. Cambium growth activity results in a tree's radial development, i.e., increase in diameter.

Cambial Dieback: The irreparable radial or vertical interruption of a tree's cambium, usually caused by mechanical damage, such as "skinning bark" or from excessive heat.

Clear Cutting: The removal of all trees from a property, whether by cutting or other means, excluding stream buffer requirements.

Coniferous: Belonging to the group of cone-bearing evergreen trees or shrubs.

City Arborist: The agent(s) of the City of Johns Creek assigned to the Community Development Department and having the primary responsibilities of administration and enforcement of the Tree Preservation Ordinance.

Critical Root Zone: The area of tree roots within the crown dripline. This zone is generally defined as a circle with a radius extending from a tree's trunk to a point no less than the furthest crown dripline. Disturbances within this zone will directly affect a tree's chance for survival.

Crown Drip Line: A vertical line extending down to the ground from the end of a tree's longest branches.

Deciduous: Not persistent; the shedding of leaves annually.

D.B.H.: Diameter-at-breast-height is a standard measure of tree size, (for trees existing on site) and is a tree trunk diameter measured in inches at a height of 4 ½ feet above the ground. If a tree splits into multiple trunks below 4 ½ feet, refer to chart in Appendix I.

Density Factor for the Site (DFS): A unit of measure used to prescribe and calculate required tree coverage on a site. Unit measurements are based upon tree size.
(a) Site acreage multiplied by (15) for Agricultural Districts = DFS.
(b) Site acreage multiplied by (20) for Single Family Residential Districts = DFS.
(c) Site acreage multiplied by (30) for Commercial Districts and all other Non-Single Family Districts = (DFS).

Director: Director of the City of Johns Creek Community Development Department.

Erosion and Sedimentation Control Ordinance: The ordinance adopted by the City that regulates soil erosion and its transportation to the City's lakes, rivers, and streams (latest revision).

Improvement Setback: An area adjacent to a zoning buffer in which no improvements and/ or structures shall be constructed. No development activity such as tree removal, stump removal or grinding, land disturbance or grading is permitted without the approval of the Director of the Community Development Department or his/her designee.

Land Disturbing Activity: Any activity which may result in soil erosion from water or wind and movement of sediments into state water or onto lands within the state, including, but not limited to, clearing, dredging, grading, excavating, transporting, and filling of land but not including agricultural practices as described in the City of Johns Creek Soil Erosion and Sedimentation Control Ordinance.

Land Disturbance Permit: A permit issued by the Community Development Department that authorizes the commencement of alteration or development of a given tract of land or the commencement of any land disturbing activity.

Landscape Plan: A plan that identifies areas of tree preservation and methods of tree protection within the protected zone, as well as all areas of replanting. Within replanting areas, the common and botanical names of the proposed species, the number of plants of each species, the size of all plant materials, the proposed location of all plant materials, and any unique features of the plant materials shall be indicated.

Landscape Strip: An area required by this ordinance, by the City of Johns Creek Zoning Ordinance, or any condition of zoning, use permit or variance approval, which is reserved for the installation and/or maintenance of plant materials.

Minimum Setback: The minimum yards as specified in the regulations related to the zoning districts or use permit categories. A minimum required space between a property line and a structure. An area identified by a building line.

Protected Zone: Includes but is not limited to the following:

(a) Critical root zone plus an additional 3 feet; all areas of a parcel required to remain in open space;
(b) All areas required as landscape strips and/or buffers (including zoning buffers, state water buffers, and tributary buffers);

(c) Tree save areas according to provisions of the City of Johns Creek Zoning Ordinance, conditions of zoning, use permit or variance approval, and/or the Tree Preservation Ordinance and Administrative Guidelines.

Revegetation: The replacement of trees and landscape plant materials to satisfy the minimum tree density and landscape requirements, as determined by the City of Johns Creek Zoning Ordinance, condition of zoning, use permit or variance approval, or the Tree Preservation Ordinance and Administrative Guidelines.

Roots:

(a) Feeder Roots: A complex system of small annual roots growing outward and predominantly upward from the system of "transport roots". These roots branch four or more times to form fans or mats of thousands of fine, short, non-woody tips. Many of these small roots and their multiple tips are 0.2 to 1 mm or less in diameter and less than 1 to 2 mm long. These roots constitute the major fraction of a tree's root system surface area and are the primary sites of absorption of water and nutrients.

(b) Major Woody Roots: First order tree roots originating at the "root collar" and growing horizontally in the soil to a distance of between 3 and 15 feet from the tree's trunk. These roots branch and decrease in diameter to give rise to "rope roots". The primary functions of major woody roots include anchorage, structural support, the storage of food reserves, and the transport of minerals and nutrients.

(c) Rope Roots: An extensive network of woody second order roots arising from major woody roots, occurring within the surface 12 to 18 inches of local soils, and with an average size ranging from .25 to 1 inch in diameter. The primary function of rope roots is the transport of water and nutrients and the storage of food reserves.

(d) Transport Roots: The system or framework of tree roots comprised of major woody roots and rope roots.

Root Collar: The point of attachment of major woody roots to the tree trunk, usually at or near the groundline and associated with a marked swelling of the tree trunk.

Root Respiration: An active process occurring throughout the feeder root system of trees and involving the consumption of oxygen and sugars with the release of energy and carbon-dioxide. Root respiration facilitates the uptake and transport of minerals and nutrients essential for tree survival.

Setback: A space between a property line and the line to which a building or specified structure may be constructed.

Soil Compaction: A change in soil physical properties which includes an increase in soil weight per unit volume and a decrease in soil pore space. Soil compaction is caused by repeated vibrations, frequent traffic and weight. As related to tree roots, compacted soil can cause physical root damage, a decrease in soil oxygen levels with an increase in toxic gasses, and can be impervious to new root development.

State Waters: Any and all rivers, streams, creeks, branches, lakes, reservoirs, ponds, drainage systems, springs, wells, and other bodies of surface or subsurface water, natural or artificial, lying within or forming a part of the boundaries of the State which are not entirely confined and retained completely upon the property of a single individual, partnership, or corporation.

Thinning: Selective cutting or removal of timber. The basal unit of (30) units per acre for Commercial Districts and all other non single family districts; (20) units per acre for Single Family Residential Districts; (15) units per acre for Agricultural Districts shall be maintained after selective cutting, or removal of timber has occurred.

Timber Harvesting: The felling of timber products (pulp wood, etc). The term "timber harvesting" may include both clear cutting and thinning of timber.

Tree:

(a) Tree: Any self supporting woody perennial plant which has a trunk diameter of 2 inches or more measured at a point 6 inches above the ground level and which normally obtains a height of at least 10 feet at maturity, usually with one main stem or trunk and many branches.

(b) Heritage Tree: A tree which is designated upon approval by the Director of the Community Development Department or his/her designee to be of notable historical value or interest because of its age, size, or historical association.

(c) Specimen Tree: Any tree which has been determined by the City Arborist to be of high value because of its type, size, age, or other professional criteria, and has been so designated according to administrative guidelines established by the Community Development Department.

(d) Stand of Specimen Trees: A contiguous grouping of trees which has been determined to be of value by the Director of the Community Development Department or authorized designee(s).

(i) A relatively mature even aged stand.
(ii) A stand with purity of species composition or of a rare or unusual nature.
(iii) A stand of historical significance.
(iv) A stand with exceptional aesthetic quality.

Tree Bank: A site such as a school or public park, where the owner/developer shall donate and plant the required trees when it is not feasible to plant the required trees within their site's project area.

Tree Preservation Ordinance: This Ordinance, approved and adopted by the City Council of the City of Johns Creek to provide standards for the protection, preservation and replacement of trees regulated and enforced by the City Arborist in conjunction with the Department of Community Development or designated agent(s) through development and construction permits and processes.

Tree Save Area: All areas designated for the purpose of meeting tree density requirements, saving specimen trees, and/or preserving natural buffers.

Tributary: Any perennial stream (or portion thereof) within the affected area that is portrayed as a solid blue line on the United States Geological Survey 7.5 Quadrangle Maps, 1968 edition, or other perennial streams as identified by the City of Johns Creek.

Wetlands: Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bog, and similar areas.

Zoning Regulations: The Zoning Ordinance of the City of Johns Creek as amended or such regulations subsequently adopted by the City Council inclusive of conditions of zoning, use permit or variance approval established pursuant thereto.

All other terms: All other words or phrases as appropriate to the context of their uses shall be interpreted as defined in the Zoning Regulations.

Section 4: Permit Procedures

(a) All applications for a Land Disturbance Permit shall provide a landscape plan and other documentation as required and as applicable for all areas of the tract of land within a protected zone. All applications and required supplemental information shall be submitted to the Director of the Community Development Department.

(b) All landscape plans and related documentation shall be reviewed by the City Arborist for conformance to the provisions of these regulations and either approved, returned for revisions, or denied within 30 days of receipt. If denied or returned for revisions the reasons for denial or revision shall be annotated on the landscape plan or stated in writing.

(c) Issuance of a valid Land Disturbance Permit shall constitute an approval of the required landscape plan and shall indicate conformance to the provisions of these regulations.

(d) For issuance of any residential building permit, applicant must sign and agree to abide by the Residential Erosion & Sedimentation Control Tree Protection Agreement, (see Appendix H. to the Administrative Guidelines). This shall also apply to parcels upon which a land disturbance permit has been previously issued with a tree protection plan approved by the City Arborist. The Director of the Community Development Department, or his/her designee, is authorized to execute such Agreements on behalf of the City of Johns Creek.

(e) For issuance of a Timber Harvesting Permit, applicant agrees to maintain a 25-foot undisturbed buffer along the entire perimeter of the property. This buffer must be maintained for the duration of the timber harvesting activity.

Section 5: Removal of Tree(s)

(a) If the owner/developer proposes to remove any tree(s) in the protected zone, then the owner/developer must document a hardship such as but not limited to economic or zoning restrictions and submit it as part of the application for a Land Disturbance Permit. The application shall be subject to the approval of the Director of the Community Development Department, or his/her designee before any trees are to be removed from the site. Nothing in these regulations shall be construed to allow the removal of vegetation in a natural, undisturbed buffer required by the Zoning Ordinance.

(b) When no trees are present in the protected zone or when disturbance of any portion of the protected zone is approved, it shall be the responsibility of the owner/developer to revegetate said areas (in which improvements are not constructed) with trees or other plant materials subject to zoning regulations or, in lieu thereof, administrative guidelines established by the Community Development Department.

(c) Not withstanding any of the other requirements of these regulations, it shall be unlawful to remove a specimen tree without the express written permission of the City Arborist or authorized agent(s). Administrative guidelines have been established by the Director of the Community Development Department for the identification, preservation and protection of specimen trees.

Section 6: Violations

Citations for any of the following violations, by authorized City of Johns Creek enforcement agent(s) may constitute issuance of an immediate stop work order.

(a) Land disturbance and/or tree removal within state water, tributary, or zoning buffer(s).
(b) Land disturbance and/or tree removal within tree save area(s).

(c) Illegal removal or disturbance of specimen tree, heritage tree or stand of trees.
(d) Improper installation of tree fencing.
(e) Other violations of any provision(s) of this Ordinance or the Administrative Guidelines established pursuant thereto, including Appendices.

Section 7: Enforcement

(a) It shall be the duty of the Director of the Department of Community Development and designated agent(s) to enforce this Ordinance and Administrative Guidelines. The Department of Community Development and designated agent(s) shall have the authority to modify, revoke, suspend, or void any Land Disturbance Permit and shall have the authority to suspend all work on a site or any portion thereof.

(b) The Director of the Community Development Department and designated agent(s) shall serve as the issuing authority and shall have the power to withhold all permits, including, but not limited to, final certificates of occupancy, building permits and all permits on the subject site until it is determined by the issuing authority that the site complies with this ordinance and the provisions of the formal plan approved by the city.

Section 8: Inspections

(a) The Community Development Department is the issuing authority and may cause inspection of compliance to be made periodically by its designated agent(s) during the course of the project and shall make a final inspection following the completion of the work. Applicants shall cooperate with the issuing authority in conducting such inspections.

(b) The Community Development Department shall have the power to conduct such investigations as it may reasonably deem necessary to carry out its duties as prescribed in this Ordinance and Administrative

Guidelines, including but not limited to the power to enter at reasonable times upon any property, public or private, for the purpose of investigating and inspecting the sites of any land disturbing or tree removal activities.

(c) The Director of the Community Development Department is authorized to design and implement an inspection program involving private inspectors acceptable to the Department.

(d) No person shall refuse entry or access to any authorized representative or agent who requests entry for the purpose of inspection and who presents appropriate identification, nor shall any person obstruct, hamper or interfere with any such representative while in the process of carrying out his official duties.

Section 9: Notice of Violation

(a) If, through inspection, it is determined that a person, firm, or corporation has 1.) engaged in land disturbing or other activities, which have resulted in the removal of trees; or 2.) failed to comply with the terms and conditions of a validly issued permit, then a written notice of violation shall be served upon the property owner or the agent of record.

(b) Where a person, firm, or corporation has engaged in land disturbing or tree removal activities without having first secured a permit therefore in violation of this Ordinance and Administrative Guidelines, notices under the provisions of this section may be served upon the person in charge or any person representing the person in charge on the site. All construction and land disturbance activity shall be discontinued until the necessary measures to achieve compliance have been fulfilled.

(c) The notice shall set forth the measures necessary to achieve compliance with the permit and shall state the time within which such measures must be completed.

(d) If the person, firm, or corporation engaged in land disturbing activity fails to comply within the time specified, he/she shall be subject to citation for violation of this Ordinance and Administrative Guidelines.

Section 10: Stop Work Orders

(a) Upon notice from the Director of the Community Development Department, work on any project that is being done contrary to the provisions of this Ordinance and Administrative Guidelines shall be immediately stopped, until such time that the violation has been remedied to the satisfaction of the Director of the Community Development Department. Prior to remediation a plan shall be submitted to and approved by the City Arborist.

(b) Such Notice:

(i) shall be in writing.
(ii) shall state the specific violation(s).
(iii) shall be given to the applicant, owner, the authorized agent of either, or the person in charge, or any person representing the person in charge of the activity on the subject property.
(iv) shall state the conditions under which work may be resumed.
(v) where an emergency exists, no written notice shall be required.
(vi) shall allow only erosion control work to continue while stop work is in effect

Section 11: Modification, Revocation, Suspension, Voidance of Permit

A land disturbance permit and/or other permit(s) required by this Ordinance and Administrative Guidelines may be modified, revoked, suspended, or voided by the Director of the Community Development Department upon finding that the holder is in violation of the terms of the permit or any portion of this Ordinance and Administrative Guidelines.

Section 12: Bonding

The Director of the Community Development Department will evaluate all development projects (excluding timber harvesting) requesting property clear cutting. If upon completion of the site evaluation, the Community Development Department deems it appropriate to allow property clear cutting activities, a bond will be required. The bond will be required by the City of Johns Creek as a mechanism to cover any potential cost associated with revegetation of the clear-cut property in the event of property abandonment.

The required bond amount will be 125 percent (%) of the total cost for replanting trees to satisfy the density standards for the project site. A tree replacement cost obtained from a plant nursery will be provided to Director of the Community Development Department with the clear-cut request and the bond amount will be based on the tree replacement cost. The Director of the Community Development Department reserves the right to request additional replacement cost if deemed appropriate. The Director of the Community Development Department will hold the bond until the project activity, including tree replacement to satisfy the site density requirements, is completed. If upon issuing the land disturbance permit, the property is clear cut and there are no construction or development activities conducted within six (6) months, The Director of the Community Development Department will attempt to contact the property owner (via certified mail) for a project update. Should the property owner not respond within thirty (30) days of receipt of the status request, the bond will be used to revegetate the project site.

Section 13: Fines and Penalties

(a) Any person, firm, corporation or other entity violating any of the provisions of this Ordinance shall be liable for a fine of up to a maximum $1000.00 per violation per day. Each calendar day a violation exists shall be considered a separate offense. There are no maximum limitations to the accrual of fines.

(b) Each owner of any property wherein a violation exists shall be jointly and severally responsible for said violations. Each offense will be tried in the Municipal Court of Johns Creek.

Section 14: Appeals

(a) Any person aggrieved or affected by any decision of the City Arborist relating to the application of these regulations may file an appeal within thirty (30) days of the decision with the Director of the Community Development Department for relief or reconsideration.

(b) Any person aggrieved or affected by any decision of the Director of the Department of Community Development relating to the application of these regulations may file an appeal within 30 days of the decision with the Mayor and City Council (until such time as the Board of Zoning Appeals is established) and the Board of Zoning Appeals once established by the Mayor and City Council. The appeal shall be made through the Director of Community Development.

(c) Appeals shall only be granted for errors of interpretation or where the unique natural features of the site are such that application of these regulations would create an undue hardship to the property owner, and in other instances where an undue hardship is created for the owner of the property.

Section 15: Validity

Should any section or provision of this Ordinance, or its accompanying Administrative Guidelines, be declared by a court of competent jurisdiction to be invalid, such decision shall not affect the validity of the Ordinance in whole or any part thereof other than the part so declared invalid.

SECTION II. ADMINISTRATIVE GUIDELINES FOR AG-1, AGRICULTURE DISTRICT

This set of guidelines shall apply to land uses within the City of Johns Creek Agriculture District. The Agriculture District is intended to encompass lands devoted to a wide range of uses including single family subdivisions, agricultural and closely related land uses.

A. PROCEDURES

Land Disturbance Permits

a. **Step 1.** Application Forms
Filing application forms and obtaining Ordinance and Administrative Guidelines information.

b. **Step 2.** Tree Protection Plan
A tree protection plan, (TPP) shall be submitted with other permit drawings as part of the land disturbance permit process. This plan may either be a separate drawing or part of the landscape plan and shall include the following information:

1. Tree Protection Details, detail drawings of tree protection measures and landscape strips (whichever is applicable or both).

- Protective tree fencing.
- Erosion control fencing.
- Tree protection signs.
- Transplanting specifications.
- Tree wells.
- Staking specifications.
- Other applicable drawings.
- Landscape installation plans, planting details, plant list

2. Spatial Limits

- Definition of spatial limits.
- Limits of land disturbance, clearing, grading and trenching.
- Tree protection zones.
- Specimen trees or stands of trees.
- Areas of revegetation and tree density calculations.
- State waters buffers and/or tributary buffers.

3. Implementation Schedule

- Procedures and schedules for the implementation, installation and maintenance of tree protection measures.

c. **Step 3.** Review Process

These plans shall be reviewed by the City Arborist or his designated agent(s) for conformance with:

- Applicable Overlay District Regulations
- City of Johns Creek Zoning Ordinance
- Applicable Zoning, Use Permit and/or Variance Conditions
- Tree Preservation Ordinance & Administrative Guidelines
- Any and all Ordinance and Administrative Guidelines dealing with natural resources
- Plans will be either approved, denied or returned for revisions.
- Reasons for denial shall be stated in writing on the tree protection plan.

d. **Step 4.** Tree Protection Measures

All tree protection measures shall be installed by the contractor and then inspected by the City Arborist or designated agent(s) prior to any land disturbance.

e. **Step 5.** Land Disturbance Permit

Issuance of the land disturbance permit is contingent upon approval of the Tree Protection Plan.

f. **Step 6.** Follow-up

The City Arborist will conduct follow-up site inspections for enforcement of the Tree Preservation Ordinance and its Administrative Guidelines.

2. Rezoning and Special Use Permits

a. **Step 1.** Application Forms

Filing application forms and obtaining Ordinance and Administrative Guidelines information.

b. **Step 2.** Case Review

The City Arborist may conduct a preliminary review of all rezoning cases and special use permit applications.

c. **Step 3.** Field Review

A field review of cases may occur under the following conditions:

1. For community unit plans and major development cases.
2. For cases within the Chattahoochee River Corridor.
3. For cases within overlay districts.
4. Other cases as determined necessary by the preliminary review.

d. **Step 4.** Conditions

Conditions to rezoning may be required as found necessary by the preliminary review. These conditions may either be general or specific in nature and will reflect the guidelines or provisions of the Tree Preservation Ordinance and Administrative Guidelines and the Zoning Ordinance.

e. **Step 5.** Verification
Compliance with these conditions will be verified by review of a revised site plan prior to the issuance of a land disturbance permit.

3. Timber Harvesting Permit Requirements

Agriculture (AG-1) Land Uses
A timber harvest permit is required when more than 2 acres of land is clear cut or thinned. If 2 acres or less of land is clear cut or thinned a timber harvest permit will not be required, but site tree density still has to be met. Clear cutting is allowed on AG-1 zoned land only. Thinning is allowed in all zoning/land use categories. This permit does not allow any clearing, thinning or disturbance to state water, tributary, or wetland buffers. Clear cutting is cutting trees down flush with the ground; stump removal is prohibited. Any portion of land clear cut or thinned under this provision is still required to meet the minimum site density of 15 units per acre, which may require replanting some trees.

a. **Step 1.** Application Form and Site Plan
A filled-out timber harvest application form must be accompanied with a site plan.

b. **Step 2.** Application and Site Plan Review
The City Arborist will conduct review of all timber harvesting applications and site plans. The review of applications and site plans will be based on meeting minimum guidelines.

Site Plan Minimum Guidelines
1. Note stating that no stump removal or grading is allowed under this permit;
2. All areas of existing trees shall be shown;
3. All areas of trees to be cleared-cut or thinned shall be shown;
4. All areas of trees to be saved shall be shown;
5. All streams, creeks, lakes, wetlands and applicable buffer areas shall be shown;
6. Investigation must be conducted by a forester registered in the state of Georgia. Plan must be designed by a forester registered in the state of Georgia. The plan must be affixed with the forester's registered seal.

Other Minimum Guidelines
Timber Harvesting under this provision shall be in compliance with the following guidelines:

1. State Waters / Tributary Buffers prescribed by the Chattahoochee River Corridor Tributary Protection Area Ordinance, City of Johns Creek Tributary Protection Ordinance and Soil Erosion and Sedimentation Control Ordinance of 2007.

2. Erosion control prescribed by the Soil Erosion and Sedimentation Control Ordinance of 2007.

3. Stream crossing prescribed by the Soil Erosion and Sedimentation Control Ordinance of 2007.

4. A 25 foot undisturbed buffer shall be provided and maintained along the entire perimeter of the property, including road frontages, during the timber harvesting activity, except for authorized access crossings.

5. The property shall be required to meet a tree density standard of 15 units per acre, not including the 25' buffer, upon completion of the authorized timber harvesting activities.

6. The owner/developer shall utilize the recommended Best Management Practices as established by the Georgia Forestry Commission. *IMPORTANT NOTE: Concerning the best management practice of SMZ'S, or stream side management zones, no timber harvesting can occur within the 25 foot State Waters Buffer, the 50 foot blueline Tributary Buffer, or the 75 foot State Waters Buffer. All buffers are measured from the top of the bank on both sides of a stream or creek that has been delineated by City of Johns Creek as State Waters.

7. As part of the process of obtaining a timber harvest permit on property zoned AG-1 in the City of Johns Creek, it shall be the responsibility of the property owner to notify the Department of community development in writing of the following information:

- Location of the property by road name, land lot, district, and address, if any;
- The name, address and phone number of the property owner;
- A letter written by the property owner authorizing timbering or logging operations to be conducted on their property;
- The name, address, and phone number of the logging firm or logger harvesting the timber; and
- The estimated starting and completion dates.

**IMPORTANT NOTE: Large Pine Trees 24" d.b.h. or greater shall be excluded from specimen tree protection requirements in timber harvesting operations on AG-1 zoned land. Specimen hardwood trees, however, will not be excluded and are to be protected with tree fence out to a distance of 3' beyond the edge of their root protection zone.

4. Residential Erosion & Sedimentation Control and Tree Protection Agreement Form

Step 1. Application Form: Obtain a Residential Erosion & Sedimentation Control and Tree Protection Agreement Form; fill out and submit allong with application for a building permit.

Step 2. Requirements: Must protect enough trees somewhere on the lot to meet the City of Johns Creek minimum of 15 tree units per acre.

See Appendix I. to review a copy of the Residential Erosion & Sedimentation Control & Tree Protection Agreement Form.

B. TREE PROTECTION

1. Guidelines For Specimen And Heritage Trees And Stands of Trees

Specimen and Heritage Tree: Any tree in fair or better condition which equals or exceeds the following diameter sizes.

Tree Type	Tree Diameter Size	Examples
Large hardwoods	27" d.b.h.	Oak, Hickory, Yellow Poplar,Sweetgum, etc.
Large hardwood	24" d.b.h.	Beech
Large softwoods	24" d.b.h.	Pine, Deodar Cedar
Small Native Flowering	10" d.b.h.	Dogwood, Redbud, Sourwood

A tree in fair or better condition must meet the following minimum guidelines:

a. A life expectancy of greater than 10 years.
b. A relatively sound and solid trunk with no extensive decay or hollow, and less than 20 percent radial trunk dieback.
c. No more than one major and several minor dead limbs (hardwoods only).
d. No major insect or pathological problem.
e. A lesser sized tree can be considered a specimen if it is a rare or unusual species, of exceptional quality, or of historical significance.
f. A lesser size tree can be considered a specimen if it is specifically used by a builder, developer, or design professional as a focal point in a project or landscape.

Specimen Tree Stands: A contiguous grouping of trees which has been determined to be of value by the Director of Community Development or Authorized designee(s). Determination is based upon any one or more of the following criteria:

a. A relatively mature even-aged stand.
b. A stand with purity of species composition or of a rare or unusual nature.
c. A stand of historical significance.
d. A stand with exceptional aesthetic quality.

2. Methods of Tree Protection

a. Planning consideration

Root space is the most critical factor in tree protection throughout the development process. The root system of trees easily goes beyond the dripline of the tree canopy. Disturbance within the root zone can directly affect a tree's chances for survival. To protect the root zone the following guidelines shall apply:

1. The use of tree save areas is encouraged. This will facilitate overall site organization as related to tree protection.

2. The root protection zone of specimen trees, heritage trees, undisturbed buffers, stands of trees or otherwise designated tree save areas shall include no less than the area of a circle with a radius that extends one foot out for every inch of trunk diameter, or the area of a circle with a radius extending from a tree's trunk to a point no less than the end of a tree's longest branch, **whichever is greater**. In some instances, the City Arborist or authorized agent(s) may require an additional area of no disturbance up to 10 feet outside the root protection zone. (See Appendix A. Typical Root Protection Zone)

3. Layout of the project site utility and grading plans must accommodate the required tree protective zones. Utilities must be placed along corridors between protective zones.

4. Construction site activities such as parking, material storage, bury pits, concrete washout, burnhole placement, etc., shall not be allowed within tree protection zones.

5. No disturbance shall occur within the protection zone of specimen and heritage trees or stands of trees.

b. Protective Barriers

1. Protective tree fencing shall be installed a minimum of 3 feet beyond the outer edge of the root protection zone for all specimen trees, heritage trees, stands of trees, or otherwise designated tree protection zones, **prior to any land disturbance**.

2. Acceptable Tree Fencing Procedures
   - A minimum of 4 feet high, constructed in a post and rail configuration. A 2 inch x 4 inch post and a double 1 inch x 4 inch rail is recommended.
   - Four foot orange polyethylene laminar safety fencing.
   - Any deviation from the two acceptable tree fencing methods listed above must be authorized by the City Arborist or designated agent(s).
   - All tree protection fences must be accompanied by "Stay Out" and "Tree Save" signage. Tree protection signs are available at the City of Johns Creek City Hall in the Department of Community Development for $3.00 each.

3. A stop work order or notice of violation will be issued if project is found to be out of compliance with the Tree Protection/Landscape Plan.

4. All specimen trees, heritage trees, stands of trees or otherwise designated tree protection zones must be protected from silt.

   - Silt fencing reinforced with wire mesh fencing must be placed along the outer uphill edge of tree protection zones at the land disturbance interface.
   - Silt fencing should be backed by 12 gauge, 2 inch x 4 inch wire mesh fencing in areas of steep slope. (Steep slopes are defined as greater than 3H:1 V).
   - All erosion control measures must comply with City of Johns Creek Erosion Control Guidelines.

5. All tree fencing and erosion control barriers must be installed prior to and maintained throughout the land disturbance process and building construction and may not be removed until the certificate of occupancy is

approved and issued by the Director of the Department of community development or a designated agent(s).

C. REVEGETATION

1. Tree Replacement

a. The replacement of trees to satisfy the conditions of zoning, requirements of the City of Johns Creek Zoning Ordinance or the Tree Preservation Ordinance and Administrative Guidelines, may occur under the following situations:

- To establish the minimum tree density requirements for the site, where grading occurs outside the buildable area of the lot.
- If the lot's buildable area leaves no protected zone.
- If no trees are present within an existing protected zone.
- Where specimen trees or stands of trees and trees within otherwise designated tree protection zones have been irreparably damaged or removed through land disturbance or construction activities.

  NOTE: Unless enough existing trees are saved on site to satisfy density requirements, proposed replacement trees will have to be bonded off prior to issuance of the Land Disturbance Permit.

b. The quantity of replacement trees into a site must be sufficient so as to produce a total site tree density factor of no less than 15 units per acre. If it has been determined by the City Arborist or designated agent(s) during the initial site visit that the property in question is completely barren of trees and has been for a long time (i.e., pasture land), then the units for replacement trees will be doubled. (For example, a 4 inch replacement tree is currently equivalent to 0.7 units; at a site determined to be barren of trees, the replacement units will be equivalent to 1.4 instead of 0.7 units.) The site will still be required to meet the 15 unit per acre site tree density requirement. (Note: the terms unit and tree are NOT interchangeable). Procedures for determining the site density requirements and the subsequent tree replacement requirements are provided in Table 1.0 and Table 2.0 in the next section. No more than 30% of the replacement trees can be pines. At least 70% of replacement trees must be hardwoods of at least 4 different species.

c. The spacing of replacement trees must be compatible with spatial limitations and with responsible consideration towards potential species size.

d. Where the City Arborist or designated agent(s) has determined that site spatial constraints result in the inability to provide for all the required trees, as many trees as possible must be planted on site. The remaining balance of required trees must be planted on public properties using the **Tree Bank** alternative or the installed cost of the remaining balance of required trees must be contributed to the **Tree Replacement Fund** in the form of a certified check. A **Conservation Easement** on a greenspace can also be deeded to the City as compensation for specimen trees removed or to meet site tree density. (Contact the City Arborist for details on conservation easement.)

2. Specimen Tree Recompense

a. Any and all healthy specimen trees that the City of Johns Creek Arborist allows a developer/builder/homeowner to remove must be compensated for. Specimen hardwood trees have to be compensated for with either 2" or 4" caliper hardwood trees. Specimen evergreen trees have to be compensated for with either 2" or 4" caliper Southern Magnolias, Deodar Cedars, Canadian Hemlocks, or Cryptomerias. Specimen native flowering trees have to be compensated for with either 2" or 4" caliper hardwood trees. Four (4) different species (minimum) of recompense trees must be used if the number of recompense trees required is forty (40) or greater. For purposes of recompense trees **only**, the unit value of a 2" caliper *recompense* tree will be **.35** units, not its usual **.5** unit value. Any and all specimen trees that are slated for removal must have their recompense trees bonded off prior to issuance of the land disturbance permit.

If a specimen tree or trees are removed without permission or the City Arborist determines that the damage to the root protection zone of a specimen tree results in a specimen tree having less than a 50% chance of surviving for two (2) years, the unit value of the specimen tree is doubled and that becomes the unit value that must be compensated for. For example: A 30" DBH tree is normally worth 14.7 units. If it is removed or its root protection zone disturbed without permission its unit value will double to 29.4 units. Thus 29.4 units of 2" or 4" caliper trees will have to be replaced at the project site. Recompense trees **cannot** be used to satisfy any other landscape requirement such as parking lot shade trees, landscape strip, undisturbed buffer or detention pond buffer trees. They can, however, count toward the required tree density for the site. 2" caliper recompense trees that are counted for density will be worth .35 units per tree.

If the root protection zone of a specimen tree is disturbed without permission, and the City Arborist has determined that the tree has a greater than 50% chance of surviving for two years, and the violator has submitted an acceptable prescription for continued maintenance of the endangered tree, then 50% of the unit value of the specimen tree is the unit value that must be compensated for. The recompense generated shall be divided equally with 50% of the recompense amount deposited into the Tree Replacement Fund and 50% of the recompense amount deposited into an escrow account. The half deposited into the Tree Replacement Fund is forfeited as restitution for the encroachment of the root protection zone; the half deposited into the escrow account shall be returned to the violator after a period of two (2) years with the submittal and acceptance by the City Arborist of an affidavit by the certified arborist certifying that the tree has not declined beyond the natural aging process or that no other decline has occurred which could have been prevented by the property owner. The violator will have one (1) year following the end of the aforementioned two (2) year period to make application to the City for fund deposited into the escrow account. In the event no application is made within the one (1) year period, the amount placed in escrow will be forfeited to the Tree Replacement Fund.

TREE BANK

Arrangements will be made through the City Arborist. If the tree bank is an alternative for your development, then the following criteria must be observed:

- The tree bank site location must be in the same planning area of the city (defined in the Comprehensive Plan) as the project site.
- Four different species needed if total quantity of trees to be banked is 40 or greater.
- Each tree bank tree must be 2 inch caliper size at a minimum; 2 inch or 4 inch caliper required for recompense trees.
- All tree bank trees must be grade "A" quality trees with straight trunks and dense foliage and free from injury, pests, disease or nutritional disorders.
- All tree bank trees are to be guaranteed for 1 full year after planting by the developer. Any trees that die within this time period must be replaced by the developer.
- The following notes must be shown on the approved tree protection plan:

WHEN THE OWNER/DEVELOPER/CONTRACTOR CALLS THE ARBORIST'S OFFICE (678) 512-3290 FOR A FINAL INSPECTION, THE OWNER/DEVELOPER/ CONTRACTOR SHALL INFORM THE ARBORIST THAT THE SITE VISIT INCLUDES A SITE VISIT TO A PUBLIC PROPERTY TO INSPECT TREES THAT HAVE BEEN TREE BANKED.

ANY CHANGES IN TREE VARIETY MUST BE APPROVED IN WRITING BY THE CITY OF JOHNS CREEK ARBORIST'S OFFICE AT (678) 512-3290 PLANTING MUST BE COMPLETED BY THE OWNER/DEVELOPER AND THE PLANTING MUST BE INSPECTED AND APPROVED BY THE CITY OF JOHNS CREEK ARBORIST PRIOR TO THE ARBORIST'S SIGN-OFF ON THE CERTIFICATE OF OCCUPANCY OR FINAL PLAT RECORDING FOR THE PROJECT.

TREE REPLACEMENT FUND

Arrangements will be made through the City Arborist. If the tree banking alternative is not desirable, then the tree replacement fund is another alternative to help your development meet its tree density or recompense tree requirements. If the Tree Replacement Fund is an alternative for your development, then the following criteria must be observed:

- Tree replacement cost estimates obtained from three landscape contractors must be provided to City of Johns Creek Arborist for approval and the trees replacement cost will be based on an average of the three estimates.
- The required replacement fee will be 100 percent (%) of the total cost to plant the balance of trees that were unable to be planted to satisfy the site density requirement or recompense tree requirements.
- Species selected for replacement must be grade "A" quality, healthy trees and must be ecologically compatible with the specifically intended growing site. Guidelines for transplanting and selecting quality replacement stock are provided in Transplanting Guidelines Section. A site specific tree list will be provided by the City Arborist upon request.

2. Procedures for Calculating the Required Tree Replacement Density Factors (The Tree Density Factor Requirement for property located within Agricultural Districts is 15 units per acre.)

Step 1

Calculate the density factor for the site (DFS) by multiplying the number of site acres by 15.
EXAMPLE: A 2.2 acre site has a DFS of 2.2 x 15= 33.

Step 2
Calculate the existing density factor (EDF) of trees which will remain on the site to be protected during construction. EDF is determined by converting the D.B.H. of individual existing trees to density factor units, using Table 1.0. These units are then totaled to determine the EDF for the site.

EXAMPLE: A total of 5 trees will remain on the 2.2 acre site in Step 1. These trees include:

Quantity	Size	Tree type
3	18’	Oak
1	20”	Hickory
1	30”	Oak

When converted to density factor units using Table 1.0, we arrive at the following values:

D.B.H.	Units		# Trees		
18”	4.0	X	3	=	12.0
20”	4.0	X	1	=	4.0
30”	14.7	X	1	=	14.7
				EDF total	30.7

The sum total of units, 30.7, is the EDF, existing density factor.

Step 3
Calculate the required replacement density factor (RDF) by subtracting the existing density factor , (EDF) in (Step 2) from the density factor for the site (DFS) in (Step 1).

Example:

RDF	**=**	**DFS**	**-**	**EDF**
RDF	=	33.0	-	30.7
RDF	**=**	**2.3**		

Step 4
The RDF can be converted back to caliper inches using Table 2.0. Any number or combination of transplantable size trees can be used so long as their total density factor units will equal or exceed the RDF.

Example: On the 2.2 acre site the following number and size of trees will be planted:

No.	Size	Species	Density Factor Units	DF x Number =	Total
3	2"	PINE	0.5	3x0.5=	1.50
2	3"	RED MAPLE	0.6	2 x 0.6 =	1.20
				replacement density factor < or = to	2.70

2.70 is the sum of the transplantable trees for the site. Because the sum of the transplantable trees for the site is greater than the RDF, which is 2.30, the project’s site density has been satisfied.

Conversion Tables

TABLE 1.0 – EXISTING TREES TO REMAIN
Conversion from D.B.H. to density factor units for trees remaining on the site.

D.B.H.	Units	D.B.H.	Units	D.B.H.	Units
1-4	0.4	36	21.3	59	56.9
5-7	1.2	37	22.5	60	58.9
8-9	2.0	38	23.7	61	60.8

10	2.4	39	24.9	62	62.8
11	2.8	40	26.1	63	64.9
12	3.2	41	27.6	64	67.0
13-15	3.6	42	28.8	65	69.1
16-20	4.0	43	30.3	66	71.2
21	4.8	44	31.8	67	73.4
22	5.2	45	33.0	68	75.6
23	8.7	46	34.5	69	77.9
24	9.3	47	36.0	70	80.1
25	10.2	48	37.8	71	82.4
26	11.1	49	39.3	72	84.8
27	12.0	50	40.8	73	87.1
28	12.9	51	42.7	74	89.6
29	13.8	52	44.2	75	92.0
30	14.7	53	45.9	76	94.5
31	15.6	54	47.7	77	97.0
32	16.8	55	49.4	78	99.5
33	17.7	56	51.3	79	102.1
34	18.9	57	53.1	80	104.7
35	20.1	58	55.0		

TABLE 2.0 – REPLACEMENT TREES
Conversion from caliper to density factor units for replacement trees.

CALIPER	UNITS	CALIPER	UNITS
1	0.4	8	1.3
2	0.5	9	1.5
3	0.6	10	1.7
4	0.7	11	1.9
5	0.9	12	2.1
6	1.0	13	2.3
7	1.2	14	2.5

Container grown pine trees are given replacement credit as follows:

SIZE	UNITS
7 Gallon	0.4
3 Gallon*	0.2

The use of 3 gallon pines is permitted only with prior approval

Tree relocation: Replacement units may be granted to trees relocated on site. Tree relocation is subject to the City Arborist's or designated agent(s) approval.

3. Guidelines for Selecting Quality Replacement Stock

a. Trees selected for planting must meet the minimum requirements as provided in Tables 3.0 through 8.0 provided at the end of this section.

b. Trees selected for planting must be free from injury, pests, disease, or nutritional disorders.

c. Trees selected for planting must be of good vigor. The determination of vigor is a subjective evaluation and dependent upon species variability. The following criteria are generally used for the determination of vigor:

1. Foliage should have a green or dark green color. Vigorous trees will have large leaves and dense foliage when compared to trees with poor vigor.

2. Shoot growth for most vigorous trees will be at least 1 foot per year. At least ½ of the branches should arise from points on the lower 2/3 of a trunk.

3. Bark texture can denote vigor. Smooth or shiny bark on the trunk and branches of a young tree usually signifies good vigor, conversely, rough and dull bark could indicate poor vigor.

4. Trunk taper: the trunks of vigorous trees will generally have an increase in diameter with a decrease in height. Trees with reverse tapers or no taper should be avoided.

5. Root color: young roots of most trees will be light in color.

d. Trees selected for planting must be free of root defects. Two types of root defects generally occur:

1. Kinked roots, in which taproots, major branch roots, or both are bent more than 90 degrees with less than 20 percent of the root system originating above the kink. A tree with such roots will probably bend at the soil line when released from a supporting stake.

2. Circling or girdling roots which circle 80 percent or more of the root system by 360 degrees or more. A tree with such roots would ultimately have less than 20 percent of its system available for support.

4. Planting Minimum Requirement Tables

Table 3.0 - CALIPER TO HEIGHT RATIOS FOR DECIDUOUS TREES

STANDARD SHADE TREES		SLOW GROWING TREES		SMALL UPRIGHT
CALIPER IN INCHES	AVERAGE RANGE	MAXIMUM / MINIMUM		AVERAGE RANGE
	HEIGHT IN FEET	HEIGHT IN FEET		HEIGHT IN FEET
5/16	-	-		2 To 3
7/16	-	-		3 To 4
9/16	-	-		4 To 5
11/16	-	-		5 To 6
7/8	-	-		6 To 8
½ To ¾	5 To 6	8	3.5	-
¾ To 1	6 To 8	10	4	-
1 To ¼	8 To 10	11	5.5	-
1 1/4 To 1 ½	8 To 10	12	6.5	-
1 ½ To 1 ¾	10 To 12	14	6.5	-
1 ¾ To 2	10 To 12	14	6.5	-
2 To 2 ½	12 To 14	16	8	-
2 ½ To 3	12 To 14	16	8	-
3 To 3 ½	14 To 16	18	9.5	-
3 ½ To 4	14 To 16	18	9.5	-
4 To 5	16 To 18	22	10.5	-
5 To 6	18 AND UP	26	12	-

Table 4.0 - HEIGHT TO SPREAD RATIO FOR CONIFEROUS NURSEY TREES

HEIGHT IN INCHES	SPREAD RANGE IN INCHES
12 To 15	8 To 12
15 To 18	9 To 15
18 To 24	12 To 18
24 To 30	15 To 21
30 To 36	18 To 24
36 To 48	21 To 30
48 To 60	30 To 36
60 To 72	36 To 48

Generally the Height: Spread ratio should be no less than 2:1.

Table 5.0 – CONTAINER SIZE TO RATIO HEIGHT

	DECIDUOUS TREES	CONIFEROUS TREES
	HEIGHT SIZES	
CONTAINER SIZE	**IN FEET**	**IN INCHES**
1 GALLON	1 To 1 ½	6 To 9
5 ½" x 6"	1 ½ To 2	9 To 12
	2 To 3	12 To 15
	3 To 4	15 To 18
		18 To 24
2 GALLON	2 To 3	12 To 15
7"x7 ½"	3 To 4	15 To 18
	4 To 5	18 To 24
		24 To 30
5 GALLON	4 To 5	18 To 24
9" x 10"	5 To 6	24 To 30
	6 To 8	30 To 36
	-	36 To 42
	-	42 To 48

Table 6.0 – MINIMUM ROOT SPREAD AND BALL DIAMETER FOR DECIDUOUS TREES

CALIPER	BARE ROOT DIAMETER SPREAD FOR ALL TREES	BALL DIAMETER FOR STANDARD AND SLOW GROWING BALL AND BURLAP TREES		BALL DIAMETERS FOR SMALL UPRIGHTTREES
INCHES	INCHES	INCHES	HEIGHT IN FEET	DIAMETER INCHES
½ To ¾	12	12	2To3	10
¾ To 1	16	14	3 To 4	12
1 To 1 ¼	18	16	4 To 5	14
1 ½ To 1 ¾	20	18	5 To 6	16
1 ¼ To 1 ½	22	20	6 To 7	18
1 ¾ To 2	24	22	7 To 8	20
2 To 2 ½	28	24	8 To 9	22
2 ½To 3	32	28	9 To 10	24
3 To 3 ½	38	32	10 To 12	26
3 ½ To 4	-	38	-	-
4 To 4 ½	-	42	-	-
4 ½ To 5	-	48	-	-
5 To 5 ½	-	54	-	-

Table 7.0 – RECOMMENDED BALL DIMENSIONS FOR LARGE TREES

TREE DIAMETER	BALL DIAMETER	BALL DEPTH	APPROXIMATE WEIGHT OF BALL AND TREE
INCHES	FEET	INCHES	TONS
5	4	30	1.5
6	5	32	2.4
7	6	34	3.7
8	7	36	5.4
9	7'/2	36	6.2
10	8	38	7.4
11	9	40	9.9
12	10	40	12.2

Table 8.0 – RECOMMENDED MINIMUM BALL DIAMETERS FOR BALL AND BURLAP CONIFEROUS TREES

HEIGHT IN FEET	DIAMETER IN INCHES
1'/2 To 2	10
2 To 3	12
3 To 4	14
4 To 5	16
5 To 6	20
6 To 7	22
7 To 8	24
8 To 9	27
9 To 10	30
10 To 12	34
12 To 14	38
14 To 16	42
18 To 20	50

5. Transplanting Guidelines

a. The transplanting of new trees can result in major injury to their root system. If proper transplanting techniques are employed, conditions will be more favorable for tree recovery, and the rate of attrition for newly planted trees will be reduced.

b. Transplanting procedures shall follow guidelines established by the International Society of Arboriculture in the "Trees and Shrub Transplanting Manual". The following is a summary of several of the more important considerations provided in the manual.

- Pre-Planting Considerations

- Only healthy trees with a well developed root system and a well formed top, characteristic of the species, should be planted. Guidelines for selecting

quality stock are provided in Section C. Revegetation.

- Trees selected for planting must be compatible with the specific site conditions. A site specific tree list will be provided by the City Arborist upon request.

- The ability of a species to regenerate a new root system and to become reestablished should be considered. Deciduous and evergreen trees should be planted between November and February. Trees planted outside of this time period will NOT be accepted by City of Johns Creek unless a bond is submitted to guarantee their replanting if they die.

c. Planting procedures

- Planting holes should be no less than 1 foot wider than the root ball or bare roots of the tree being planted. A planting hole 3 times the width of the root ball is recommended.

- Trees should not be planted deeper than they were in their former location or container.

- Spade compacted bottom and sides of the planting hole should be roughed or scarified to allow the penetration of developing roots.

- Good water drainage from the bottom of the planting hole is essential for root regeneration.

- Once the transplanted tree is set, the hole should be backfilled with soil of good texture and structure. Traditionally, backfill material is comprised of a mix of native soil, organic matter such as peat, and inorganic material such as pearlite or vermiculite in a 1:1:1 ratio. A back fill with native soil alone is adequate if the soil is of good quality.

- The addition of fertilizer to backfill soil can cause root injury, and is therefore not recommended. If fertilizer must be added, a low rate should be used. Approximately 1.5 pounds of nitrogen per cubic yard of back fill is recommended for bare root plants, and 2.5 pounds of nitrogen per cubic yard of back fill for balled and burlaped trees.

- The back fill should be gently tamped (but not compacted), and soaked for settling.

- The soil should be slightly mounded to allow for settling; a ridge or dike around the perimeter of the hole can facilitate watering.

d. Post-planting procedures

- Pruning. The amount of pruning necessary for newly planted trees depends upon the trees' response to planting. A decrease in leaf surface area from pruning can result in a reduction of the production of food, thus ultimately inhibiting root development. Pruning for vigor or to train young trees should therefore be delayed until after the first growing season.

- Pruning is recommended during the first growing season if the tree is showing "transplant shock" or drought symptoms (wilting), or for the removal of weak, broken, or diseased branches. For correct pruning of trees, always follow the ANSI A300 standard practice for pruning.

- The use of commercially available anti-transpirants is recommended for deciduous trees transplanted while in foliage, if the trees begin to wilt. Anti-transpirants are chemical foliage sprays that reduce water loss through the leaf surface.

- Staking should be used on newly planted trees only where determined necessary. The extent of staking will depend upon tree strength, form and condition at planting, expected wind conditions, the amount of vehicle or foot traffic, and the level of follow-up maintenance. Staking can cause tree damage. Periodic follow-up inspections are required to prevent serious tree-staking problems. Staking should be removed as soon as the tree is capable of providing its own anchorage and support. Recommended types and uses of staking are as follows:
  1. Protective staking is used to provide a barrier from foot traffic, mowers, vehicles, etc., for trees able to stand without support.

  2. Anchor staking is used to hold a root ball in place during the period of reestablishment for trees with otherwise adequate support.

  3. Support staking is used for trees with weak trunks or oversized crowns and unable to stand without support or in wind.

  4. Guying is recommended where necessary for large transplanted trees (4" D.B.H. or greater) to provide both anchorage and support.

  5. Mulching newly planted trees will reduce competition from weeds and moderate soil moisture and temperature extremes.

  6. Fertilizer application should begin after the tree's first full growing season.

  7. Water availability for the newly planted tree should be monitored and adjusted according to the species water requirements and the site conditions.

D. LANDSCAPE STRIP AND BUFFER GUIDELINES

1. Landscape Strips

a. The width of landscape strips must, as a minimum, conform with the requirements of the conditions of zoning or the requirements of the Zoning Ordinance, which ever is greater. The width is measured from the newly dedicated right-of-way, or from the property lines of contiguous parcels, as applicable.

b. No permanent structures are permitted within landscape strips. This includes, retaining walls, curbing, dumpsters, detention facilities, etc. Monument signs, drainage structures, and sidewalks may be allowed with pre-approval.

c. Curb stops must be used to prevent vehicle overhang into required landscape strips and parking lot landscape islands. One curb stop per parking stall is required.

d. Signs within required landscape strips are subject to the approval of the Department of Community Development or designated agent(s). These signs may only be located in areas of turf or groundcover and must not conflict with the growth potential of trees and shrubs. Signs are not permitted within required undisturbed buffers.

e. The deposition of storm water runoff into drainage swales through landscape strips is generally not permitted. Exceptions will be considered only if this standard will create an undue hardship to the property owner. Under no circumstances may the width of a drainage easement through a landscape strip exceed the width of the strip.

f. Parking lot landscape islands must, at a minimum, conform to the requirements of the Zoning Ordinance. These islands must be planted with at least one 2 inch caliper (minimum) shade tree. Stormwater runoff into parking lot landscape islands may be permitted upon approval by the City Arborist.

g. When fencing is required as a condition of rezoning, the finished surface of the fence must face externally to the project. The exact location for fence placement within the landscape strip will be determined on a case by case basis by the City Arborist or designated agent(s).

h. All species within required landscape strips must be ecologically compatible with the intended growing site. If ornamental trees are used to satisfy landscape strip requirements, they will not count for satisfying tree density requirements. All plant materials are subject to Department of Community Development or designated agent(s) approval.

i. Trees within required landscape strips shall be provided as follows:
   1. Landscape strips 25 feet wide or less; a minimum of one tree for every 30 linear feet of landscape strip.
   2. Landscape strips 25 feet wide or more; a minimum of one tree for every 20 linear feet of landscape strip.
   3. Clumping is permitted.

j. All required landscape strips must be designed with at least 60% coverage in trees and shrubs, with no more than 40% coverage in grass or ground cover. Landscape strip coverage will be calculated as follows:

1. Calculate the total spatial area of the landscape strip.
2. Count the number of trees within the landscape strip and multiply by 100 square feet for trees less than 6" caliper and 200 square feet for trees 6" or greater (This will allow some credit for the spatial coverage of the tree canopy).
3. Calculate the coverage provided by the shrubs planted on center:

ON CENTER	Equals	COVERAGE PER SHRUB
*3 feet	=	9 square feet
*4 feet	=	16 square feet
*5 feet	=	25 square feet

*At maturity, shrubs must attain this width. Shrub species and spacing is subject to Arborist's approval.

4. Grass or ground cover may not exceed 40 % coverage within the strip.

2. Planting Within Rights-of-Way

Approval from the Department of Community Development, Department of Public Works and the Department of Transportation (D.O.T), where applicable, is required, as planting is generally not permitted in the rights-of-way. Where approval is received, the following conditions must be met:

a. Indemnification and maintenance agreements must be recorded with the City of Johns Creek City Clerk (678) 512-3200 prior to permitting irrigation or planting within City rights-of-way.

- These agreements must be recorded in the name of a homeowner's association (along with documentation attesting to that association's existence), for subdivisions.

- These agreements must be recorded in the property owner's name for all other types of projects.

b. Trees planted within rights-of-way cannot be counted toward the tree density requirement for a site.

- Prior to planting trees in rights-of-way, a shoulder cross-section must be provided indicating the placement of the trees in relation to the curb, and underground utilities. Placement and species are subject to the approval of the City Arborist and / or the Director of Public Works.

c. Drawings for irrigation system within rights-of-way must indicate the location of lines, heads, spray radius, shut off valves, timers and a 24 hour emergency contact phone number.

3. Buffers

a. Required undisturbed buffers must remain undisturbed and actively protected in perpetuity under the auspices of the Tree Protection Ordinance and Administrative Guidelines.

b. Buffers must be replanted where sparsely vegetated or where disturbed for approved access and utility crossings. The buffers should be replanted to meet the following guidelines:

- Must provide a visual barrier. To accomplish this screening, the plant materials must be a minimum 5 feet in height at time of planting, moderately growing evergreen and have branching all the way to the ground. Slower growing trees may be used if larger materials are planted. All buffer plant materials are subject to the City Arborist or designated agent(s) approval. Please see Appendix J for the list of acceptable evergreen plant material for undisturbed buffers.
- The number of planting rows for tree replacement in buffers is determined by the buffer width:

Buffer Width	Minimum Planting rows
<20’	2
20’ to 30’	3
31’ to 50’	4
> 50’	4 plus 1 row for each additional 15 feet

- Drainage within or through buffers is subject to the approval of the Department of Community Development or designated agent(s).
- Encroachment into buffers for the construction of retaining walls, footings, or wall supports, is not permitted unless otherwise specified in the conditions of rezoning. Encroachments into buffers shall require zoning modifications or variances as applicable.
- All buffers require a 10 foot improvement setback interior and adjacent to the buffer. No grading is allowed in this improvement setback unless permission is obtained from the Director of the Department of Community Development. (Contact the Arborist office for details.)

State Water Buffers

1. The Soil Erosion and Sedimentation Control Ordinance of 2007 as adopted by the City of Johns Creek Mayor and City Council, requires an undisturbed natural buffer extending 50 feet plus a 25 foot impervious setback from the tops of banks on all State Waters. The City of Johns Creek Community Development Department is the official delineator of State Waters in the City of Johns Creek.

2. Land Disturbance within State Water Buffers is only permitted if a variance is granted. For information about how to apply for a variance, contact the Department of Community Development at (678) 512-3200.

- As part of the land disturbance permit application, the applicant must demonstrate the extent of proposed disturbance, including the general type and extent of vegetation to be removed and replaced.
- The applicant must clearly demonstrate the need for the proposed disturbance.
- Additional information may be required on a case by case basis.
- Tributary Buffer replanting guidelines will be provided upon request. Disturbed areas within the buffer must be replanted to City guidelines using indigenous riparian vegetation.

SECTION III. ADMINISTRATIVE GUIDELINES FOR SINGLE FAMILY RESIDENTIAL DISTRICTS

This set of guidelines shall apply to land uses within The City of Johns Creek Single Family Residential District. The Single Family Residential District is intended to encompass lands devoted to residential uses and closely related land uses. (Please see City of Johns Creek Zoning Ordinance if you need more detail regarding land uses within this Land Use District).

A. PROCEDURES

1. Land Disturbance Permits

a. **Step 1.** Application Forms
Filing application forms and obtaining Ordinance and Administrative Guidelines information.

b. **Step 2.** Tree Protection Plan
A tree protection plan, (TPP) shall be submitted with other permit drawings as part of the land disturbance permit process. This plan may either be a separate drawing or part of the landscape plan and shall include the following information:

1. Tree Protection Details, detail drawings of tree protection measures and landscape strips (whichever is applicable or both).

- Protective tree fencing.
- Erosion control fencing.
- Tree protection signs.
- Transplanting specifications.
- Tree wells.
- Staking specifications.
- Other applicable drawings.
- Landscape installation plans, planting details, plant list

2. Spatial Limits

- Definition of spatial limits.
- Limits of land disturbance, clearing, grading and trenching.
- Tree protection zones.
- Specimen trees or stands of trees.
- Areas of revegetation and tree density calculations.
- State waters buffers and/or tributary buffers.

3. Implementation Schedule

- Procedures and schedules for the implementation, installation and maintenance of tree protection measures.

c. **Step 3.** Review Process
These plans shall be reviewed by the City Arborist or designated agent(s) for conformance with:

- Overlay District Regulations
- City of Johns Creek Zoning Ordinance

- Applicable Zoning, Use Permit and/or Variance Conditions
- Tree Preservation Ordinance & Administrative Guidelines
- Any and all Ordinances and Administrative Guidelines dealing with natural resources

1. Plans will be either approved or returned for revisions.
2. Reasons for denial shall be stated in writing on the tree protection plan.

d. **Step 4.** Tree Protection Measures
All tree protection measures shall be installed by the contractor and then inspected by the City Arborist or designated agent(s) prior to land disturbance.

e. **Step 5.** Land Disturbance Permit
Issuance of the land disturbance permit is contingent upon approval of the Tree Protection Plan.

f. **Step 6.** Follow-up
The City Arborist will conduct follow-up site inspections for enforcement of the Tree Preservation Ordinance and its Administrative Guidelines.

2. Rezoning and Special Use Permits

a. **Step 1.** Application Forms
Filing application forms and obtaining Ordinance and Administrative Guideline information.

b. **Step 2.** Case Review
The City Arborist may conduct a preliminary review of all rezoning cases and special use permit applications.

c. **Step 3.** Field Review
A field review of cases may occur under the following conditions:
1. For community unit plans and major development cases.
2. For cases within the Chattahoochee River Corridor.
3. Other cases as determined necessary by the preliminary review.
4. For cases within overlay districts.

d. **Step 4.** Conditions
Conditions to rezoning may be required as found necessary by the preliminary review. These conditions may either be general or specific in nature and will reflect the guidelines or provisions of the Tree Preservation Ordinance and Administrative Guideline and/or the Zoning Ordinance.

e. **Step 5.** Verification
Compliance with these conditions will be verified by review of a revised site plan prior to the issuance of a land disturbance permit.

3. Timber Harvesting Permit Requirements
For Non Agriculture Land Uses

A timber harvest permit is required when more than 2 acres of land is thinned. If 2 acres or less of land is thinned a timber harvest permit will not be required, but site density still has to be met. Only thinning shall be allowed on property zoned other than AG-1 and shall be conducted only after a timber harvest permit has been approved. This permit does not allow any thinning or disturbance of state water, tributary, or wetland buffers. Any portion of land thinned under this provision is still required to meet the minimum site density of 20 units per acre, which may require replanting some trees.

a. Step 1. Application Form and Site Plan
A filled-out timber harvest application form must be accompanied with a site plan.

b. Step 2. Application and Site Plan Review
The City Arborist will conduct review of all timber harvesting applications and site plans. The review of applications and site plans will be based on meeting minimum guidelines listed below.

Site Plan Minimum Guidelines

1. Note stating that no stump removal or grading is allowed under this permit;
2. All areas of existing trees shall be shown;
3. All areas of trees to be thinned shall be shown;
4. All areas of trees to be saved shall be shown;
5. All streams, creeks, lakes, wetlands, applicable buffer areas and tree save areas shall be shown;
6. Investigation must be conducted by a forester registered in the state of Georgia. Plan must be designed by a forester registered in the state of Georgia. The plan must be affixed with the forester's registered seal.

Other Minimum Guidelines

Timber Harvesting under this provision shall be in compliance with the following guidelines:

1. State Waters / Tributary Buffers prescribed by the Chattahoochee River Corridor Tributary Protection Area Ordinance and the Soil Erosion and Sedimentation Control Ordinance of 2007.

2. Erosion control prescribed by the City of Johns Creek Soil Erosion and Sedimentation Control Ordinance of 2007.

3. Stream crossing prescribed by the City of Johns Creek Soil Erosion and Sedimentation Control Ordinance of 2007.

4. A 25 foot undisturbed buffer shall be provided and maintained along the entire perimeter of the property, including road frontages, during the timber harvesting activity, except for authorized access crossings.

5. The property shall be required to meet a tree density standard of 20 units per acre, not including the 25 foot buffer, upon completion of the authorized timber harvesting activities.

6. The owner/developer shall utilize the recommended Best Management Practices as established by the Georgia Forestry Commission. *IMPORTANT NOTE: Concerning the best management practice of SMZ'S, or stream side management zones, no timber harvesting can occur within the 25 foot State Waters Buffer, the 50 foot blueline tributary buffer, or the 75 foot state waters buffer. All buffers are measured from the top of the bank on both sides of a stream or creek that has been delineated by City of Johns Creek as State Waters.

7. As part of the process of obtaining a timber harvest permit on property zoned Single Family Residential in the City of Johns Creek, it shall be the responsibility of the property owner to notify the Department of Community Development in writing of the following information:

- Location of the property by road name, land lot, district, and address, if any;
- The name, address and phone number of the property owner;
- A letter written by the property owner authorizing timbering or logging operations to be conducted on their property;
- The name, address, and phone number of the logging firm or logger harvesting the timber; and
- The estimated starting and completion dates.

**IMPORTANT NOTE: Large pine Trees 24" d.b.h. or greater shall be excluded from the specimen tree protection requirements in timber harvesting operations on residentially owned land. Specimen hardwood trees, however, will <u>not</u> be excluded and are to be protected with tree fence 3' beyond the edge of their root protection zone.

4. Residential Erosion & Sedimentation Control and Tree Protection Agreement Form

Step 1. Application Form: Obtain a Residential Erosion & Sedimentation Control and Tree Protection Agreement Form, fill out and submit along with application for a building permit.

Step 2. Requirements: Must protect enough trees somewhere on the lot to meet the City of Johns Creek minimum of 20 tree units per acre. See Appendix I. to review a copy of the Residential Erosion & Sedimentation Control & Tree Protection Agreement Form.

B. TREE PROTECTION

1. Guidelines For Specimen And Heritage Trees And Stands of Trees

Specimen and Heritage Tree: Any tree in fair or better condition which equals or exceeds the following diameter sizes.

Tree Type	Tree Diameter Size	Examples
Large hardwoods	27"d.b.h.	Oak, hickory, yellow poplar, sweetgum, etc.
Large hardwoods	24"d.b.h.	Beech
Large softwoods	24"d.b.h.	Pine, deodar cedar
Small native flowering	10"d.b.h.	Dogwood, redbud, sourwood

A tree in fair or better condition must meet the following minimum guidelines:

a. A life expectancy of greater than 10 years.
b. A relatively sound and solid trunk with no extensive decay or hollow, and less than 20 percent radial trunk dieback.
c. No more than one major and several minor dead limbs (hardwoods only).
d. No major insect or pathological problem.
e. A lesser sized tree can be considered a specimen if it is a rare or unusual species, of exceptional quality, or of historical significance.
f. A lesser size tree can be considered a specimen if it is specifically used by a builder, developer, or design professional as a focal point in a project or landscape.

Specimen Tree Stands: A contiguous grouping of trees which has been determined to be of value by the Director of Community Development or Authorized designee(s). Determination is based upon any one or more of the following criteria:

a. A mature even-aged stand.
b. A stand with purity of species composition or of a rare or unusual nature.
c. A stand of historical significance.
d. A stand with exceptional aesthetic quality.

2. Methods of Tree Protection

a. Planning consideration

Root space is the most critical factor in tree protection throughout the development process. The root system of trees easily goes beyond the dripline of the tree canopy. Disturbance within the root zone can directly affect a tree's chances for survival. To protect the root zone the following guidelines shall apply:

1. The use of tree save areas is encouraged, this will facilitate overall site organization as related to tree protection.

2. The root protection zone of specimen trees, heritage trees, undisturbed buffers, stands of trees or otherwise designated tree save areas shall include no less than the area of a circle with a radius that extends one foot out for every inch of trunk diameter, or the area of a circle with a radius extending from a tree's trunk to a point no less than the end of a tree's longest branch, **whichever is greater**. In some instances, the City Arborist or authorized agent(s) may require an additional area of no disturbance up to 10 feet outside the root protection zone. (See Appendix A. Typical Root Protection Zone)

3. Layout of the project site utility and grading plans must accommodate the required tree protection zones. Utilities must be placed along corridors between protection zones.

4. Construction site activities such as parking, material storage, bury pits, concrete washout, burnhole placement, etc., shall not be allowed within tree protection zones.

5. No disturbance shall occur within the protection zone of specimen and heritage trees or stands of trees.

b. Protective Barriers

1. Protective tree fencing shall be installed a minimum of 3 feet beyond the outer edge of the root protection zone for all specimen trees, heritage trees, stands of trees, or otherwise designated tree protection zones, **prior to any land disturbance**.

2. Acceptable Tree Fencing Procedures

- A minimum of 4 feet high, constructed in a post and rail configuration. A 2 inch x 4 inch post and a double 1 inch x 4 inch rail is recommended.
- Four foot orange polyethylene laminar safety fencing.
- Any deviation from the two acceptable tree fencing methods listed above must be authorized by the City Arborist or designated agent(s).
- All tree protection fences must be accompanied by "Stay Out" and "Tree Save" signage. Tree protection signs are available at the City of Johns Creek City hall in the Department of Community Development for $3.00 each.

3. A stop work order or notice of violation will be issued if project is found to be out of compliance with the Tree Protection/ Landscape Plan.

4. All specimen trees, heritage trees, stands of trees or otherwise designated tree protection zones must be protected from silt.

- Silt fencing reinforced with wire mesh fencing must be placed along the outer uphill edge of tree protection zones at the land disturbance interface.
- Silt fencing should be backed by 12 gauge, 2 inch x 4 inch wire mesh fencing in areas of steep slope. (Steep slopes are defined as greater than 3H:1 V).
- All erosion control measures must comply with City of Johns Creek Erosion Control Guidelines.

5. All tree fencing and erosion control barriers must be installed prior to and maintained throughout the land disturbance process and building construction and may not be removed until the certificate of occupancy is approved and issued by the Director of the Department of Community Development or a designated agent(s).

C. REVEGETATION

1. Tree Replacement

a. The replacement of trees to satisfy the conditions of zoning, requirements of the City of Johns Creek Zoning Ordinance or the Tree Preservation Ordinance and Administrative Guidelines, may occur under the following situations:

- To establish the minimum tree density requirements for the site, where grading occurs outside the buildable area of the lot.

- If the lot's buildable area leaves no protected zone.
- If no trees are present within an existing protected zone.
- Where specimen trees or stands of trees and trees within otherwise designated tree protective zones have been irreparably damaged or removed through land disturbance or construction activities.
  NOTE: Unless enough exisitng trees are saved on site to satisfy density requirements, proposed replacement trees will have to be bonded off prior to issuance of the Land Disturbance Permit.

b. The quantity of replacement trees into a site must be sufficient so as to produce a total site-tree density factor of no less than 20 units per acre. If it has been determined by the City Arborist or designated agent(s) during the initial site visit that the property in question is completely barren of trees and has been for a long time (ie, pasture land), then the units for replacement trees will be doubled. (For example, a 4 inch replacement tree is currently equivalent to 0.7 units, at a site where it is determined to be barren of trees, the replacement units will be equivalent to 1.4 instead of 0.7 units.) The site will still be required to meet the 20 unit per acre site tree density requirement.

   (Note: the terms unit and tree are NOT interchangeable). Procedures for determining the site density requirements and the subsequent tree replacement requirements are provided in Table 1.0 and Table 2.0 in the next section. No more than 30% of replacement trees can be pines. At least 70% of replacement trees must be hardwoods of at least 4 different species.

c. The spacing of replacement trees must be compatible with spatial limitations and with responsible consideration towards potential species size.

d. Where the City Arborist or designated agent(s) has determined that site spatial constraints result in the inability to provide for all the required trees, as many trees as possible must be planted on site. The remaining balance of required trees must be planted on public properties using the **Tree Bank** alternative or the installed cost of the remaining balance of required trees must be contributed to the **Tree Replacement Fund** in the form of a certified check. A **Conservation Easement** on a greenspace can also be deeded to the City as compensation for specimen trees removed or to meet site tree density. (Contact Arborist for details on conservation easement.)

2. Specimen Tree Recompense

a. Any and all healthy specimen trees that the City of Johns Creek Arborist allows a developer/builder/homeowner to remove must be compensated for. Specimen hardwood trees have to be compensated for with either 2" or 4" caliper hardwood trees. Specimen evergreen trees have to be compensated for with either 2" or 4" caliper Southern Magnolias, Deodar Cedars, Canadian Hemlocks, or Cryptomerias. Specimen native flowering trees have to be compensated for with either 2" or 4" caliper hardwood trees. Four (4) different species (minimum) of recompense trees must be used if the number of recompense trees required is forty (40) or greater. For purposes of recompense trees **only**, the unit value of a 2" caliper *recompense* tree will

be **.35** units, not its usual **.5** unit value. Any and all specimen trees that are slated for removal must have their recompense trees bonded off prior to issuance of the land disturbance permit.

If a specimen tree or trees are removed without permission or the City Arborist determines that the damage to the root protection zone of a specimen tree results in a specimen tree having less than a 50% chance of surviving for two (2) years, the unit value of the specimen tree is doubled and that becomes the unit value that must be compensated for. For example: A 30" DBH tree is normally worth 14.7 units. If it is removed or its root protection zone disturbed without permission its unit value will double to 29.4 units. Thus 29.4 units of 2" or 4" caliper trees will have to be replaced at the project site. Recompense trees **cannot** be used to satisfy any other landscape requirement such as parking lot shade trees, landscape strip, undisturbed buffer or detention pond buffer trees. They can, however, count toward the required tree density for the site. 2" caliper recompense trees that are counted for density will be worth .35 units per tree.

If the root protection zone of a specimen tree is disturbed without permission, and the City Arborist has determined that the tree has a greater than 50% chance of surviving for two years, and the violator has submitted an acceptable prescription for continued maintenance of the endangered tree, then 50% of the unit value of the specimen tree is the unit value that must be compensated for. The recompense generated shall be divided equally with 50% of the recompense amount deposited into the Tree Replacement Fund and 50% of the recompense amount deposited into an escrow account. The half deposited into the Tree Replacement Fund is forfeited as restitution for the encroachment of the root protection zone; the half deposited into the escrow account shall be returned to the violator after a period of two (2) years with the submittal and acceptance by the City Arborist of an affidavit by the certified arborist certifying that the tree has not declined beyond the natural aging process or that no other decline has occurred which could have been prevented by the property owner. The violator will have one (1) year following the end of the aforementioned two (2) year period to make application to the City for fund deposited into the escrow account. In the event no application is made within the one (1) year period, the amount placed in escrow will be forfeited to the Tree Replacement Fund.

TREE BANK

Arrangements will be made through the City Arborist. If the tree bank is an alternative for your development, then the following criteria must be observed:

- The tree bank site location must be in the same planning area of the city (defined in the Comprehensive Plan) as the project site.
- Four different species needed if total quantity of trees to be banked is 40 or greater.
- Each tree bank tree must be 2 inch caliper size at a minimum; 2 inch or 4 inch caliper required for recompense trees.
- All tree bank trees must be grade "A" quality trees with straight trunks and dense foliage and free from injury, pests, disease or nutritional disorders.
- All tree bank trees are to be guaranteed for 1 full year after planting by the developer. Any trees that die within this time period must be replaced by the developer.

- The following notes must be shown on the approved tree protection plan:

WHEN THE OWNER/DEVELOPER/CONTRACTOR CALLS THE ARBORIST'S OFFICE (678) 512-3290 FOR A FINAL INSPECTION, THE OWNER/DEVELOPER/ CONTRACTOR SHALL INFORM THE ARBORIST THAT THE SITE VISIT INCLUDES A SITE VISIT TO A PUBLIC PROPERTY TO INSPECT TREES THAT HAVE BEEN TREE BANKED.

ANY CHANGES IN TREE VARIETY MUST BE APPROVED IN WRITING BY THE CITY OF JOHNS CREEK ARBORIST'S OFFICE AT (678) 512-3290.

PLANTING MUST BE COMPLETED BY THE OWNER/DEVELOPER AND THE PLANTING MUST BE INSPECTED AND APPROVED BY THE CITY OF JOHNS CREEK ARBORIST PRIOR TO THE ARBORIST'S SIGN-OFF ON THE CERTIFICATE OF OCCUPANCY OR FINAL PLAT RECORDING FOR THE PROJECT.

TREE REPLACEMENT FUND
Arrangements will be made through the City Arborist. If the tree banking alternative is not desirable, then the tree replacement fund is another alternative to help your development meet its tree density or recompense tree requirements. If the Tree Replacement Fund is an alternative for your development, then the following criteria must be observed:

- Tree replacement cost estimates obtained from three landscape contractors must be provided to the City of Johns Creek Arborist for approval and the trees replacement cost will be based on an average of the three estimates.
- The required replacement fee will be 100 percent (%) of the total cost to plant the balance of trees that were unable to be planted to satisfy the site density requirement or recompense tree requirements.
- Species selected for replacement must be grade "A" quality, healthy trees and must be ecologically compatible with the specifically intended growing site. Guidelines for transplanting and selecting quality replacement stock are provided in Transplanting Guidelines Section. A site specific tree list will be provided by the City Arborist upon request.

2. Procedure for Calculating the Required Tree Replacement Density Factor <u>The Tree Density Factor Requirement for property located within Single Family Residential Districts is 20 units per acre.</u>

Step 1
Calculate the <u>density factor for the site</u> (DFS) by multiplying the number of site acres by <u>20</u>.
EXAMPLE: A 2.2 acre site has a DFS of 2.2 x 20= 44.

Step 2
Calculate the <u>existing density factor</u> (EDF) of trees which will remain on site to be protected during construction. EDF is determined by converting the D.B.H. of individual existing trees to density factor units, using Table 1.0. These units are then totaled to determine the EDF for the site.

EXAMPLE: A total of 8 trees will remain on the 2.2 acre site in Step 1. When converted to density factor units using Table 1.0, we arrive at the following values:

These trees include:

quantity	size	tree type
2	12"	pine
2	14"	pine
2	18[11]	oak
1	20"	hickory
1	30"	Oak

D.B.H.	UNITS		#TREES		
12"	3.2	X	2	=	6.4
14"	3.6	X	2	=	7.2
18"	4.0	X	2	=	8.0
20"	4.0	X	1	=	4.0
30"	14.7	X	1	=	14.7
				EDF total	40.3

The sum total of units, 40.3, is the EFD, existing density factor.

Step 3

Calculate the required replacement density factor (RDF) by subtracting the EDF (Step 2) from the DFS (Step 1).

Example:

RDF	=	DFS	-	EDF
RDF	=	44	-	40.3
RDF	=	3.70		

Step 4

The RDF can be converted back to caliper inches using Table 2.0. Any number or combination of transplantable size trees can be used so long as their total density factor units will equal or exceed the RDF.

Example: On the 2.2 acre site the following number and size of trees will be planted:

No.	Size	Species	Density Factor Units	DF x Number =	Total
3	4"	PINE	0.7	3x0.7=	2.10
2	2"	RED MAPLE	0.5	2 x 0.5 =	1.00
1	6"	OAK	1.00	1 x 1.00 =	1.00
				Replacement density factor < or	4.10

4.10 is the sum of the trasplantable trees for the site. Because the sum of the transplantable trees for the site is greater than the (RDF), which is 3.70, the project's site density has been satisfied.

Conversion Tables

TABLE 1.0 – EXISTING TREES TO REMAIN

Conversion from D.B.H. to density factor units for trees remaining on the site.

D.B.H.	Units	D.B.H.	Units	D.B.H.	Units
1-4	0.4	36	21.3	59	56.9
5-7	1.2	37	22.5	60	58.9
8-9	2.0	38	23.7	61	60.8
10	2.4	39	24.9	62	62.8
11	2.8	40	26.1	63	64.9
12	3.2	41	27.6	64	67.0
13-15	3.6	42	28.8	65	69.1
16-20	4.0	43	30.3	66	71.2
21	4.8	44	31.8	67	73.4
22	5.2	45	33.0	68	75.6
23	8.7	46	34.5	69	77.9
24	9.3	47	36.0	70	80.1
25	10.2	48	37.8	71	82.4
26	11.1	49	39.3	72	84.8
27	12.0	50	40.8	73	87.1
28	12.9	51	42.7	74	89.6
29	13.8	52	44.2	75	92.0
30	14.7	53	45.9	76	94.5
31	15.6	54	47.7	77	97.0
32	16.8	55	49.4	78	99.5
33	17.7	56	51.3	79	102.1
34	18.9	57	53.1	80	104.7
35	20.1	58	55.0		

TABLE 2.0 – REPLACEMENT TREES

Conversion from caliper to density factor units for replacement trees.

CALIPER	UNITS	CALIPER	UNITS
1	0.40	8	1.30
2	0.50	9	1.50
3	0.60	10	1.70
4	0.70	11	1.90
5	0.90	12	2.10
6	1.00	13	2.30
7	1.20	14	2.50

Container grown pine trees are given replacement credit as follows:

SIZE	UNITS
7 Gallon	0.4
3 Gallon*	0.2

The use of 3 gallon pines is permitted only with prior approval

Tree relocation: Replacement units may be granted to trees relocated on site. Tree relocation is subject to the Arborist or designated agent(s) approval.

3. Guidelines for Selecting Quality Replacement Stock

a. Trees selected for planting must meet the minimum requirements as provided in Tables 3.0 through 8.0 provided at the end of this section.

b. Trees selected for planting must be free from injury, pests, disease, or nutritional disorders.

c. Trees selected for planting must be of good vigor. The determination of vigor is a subjective evaluation and dependent upon species variability. The following criteria are generally used for the determination of vigor:

1. Foliage should have a green or dark green color. Vigorous trees will have large leaves and dense foliage when compared to trees with poor vigor.

2. Shoot growth for most vigorous trees will be at least 1 foot per year. At least ½ of the branches should arise from points on the lower 2/3 of a trunk.

3. Bark texture can denote vigor. Smooth or shiny bark on the trunk and branches of a young tree usually signifies good vigor, conversely, rough and dull bark could indicate poor vigor.

4. Trunk taper: the trunks of vigorous trees will generally have an increase in diameter with a decrease in height. Trees with reverse tapers or no taper should be avoided.

5. Root color: young roots of most trees will be light in color.

d. Trees selected for planting must be free of root defects. Two types of root defects generally occur:

1. Kinked roots, in which taproots, major branch roots, or both are bent more than 90 degrees with less than 20 percent of the root system originating above the kink. A tree with such roots will probably bend at the soil line when released from a supporting stake.

2. Circling or girdling roots which circle 80 percent or more of the root system by 360 degrees or more. A tree with such roots would ultimately have less than 20 percent of its system available for support.

4. Planting Minimum Requirement Tables

Table 3.0 - CALIPER TO HEIGHT RATIOS FOR DECIDUOUS TREES

STANDARD SHADE TREES		SLOW GROWING TREES	SMALL UPRIGHT
CALIPER IN INCHES	AVERAGE RANGE	MAXIMUM / MINIMUM	AVERAGE RANGE
	HEIGHT IN FEET	HEIGHT IN FEET	HEIGHT IN FEET
5/16	-	-	2 To 3
7/16	-	-	3 To 4
9/16	-	-	4 To 5
11/16	-	-	5 To 6
7/8	-	-	6 To 8

½ To ¾	5 To 6	8	3.5	-
¾ To 1	6 To 8	10	4	-
1 To ¼	8 To 10	11	5.5	-
1 1/4 To 1 ½	8 To 10	12	6.5	-
1 ½ To 1 ¾	10 To 12	14	6.5	-
1 ¾ To 2	10 To 12	14	6.5	-
2 To 2 ½	12 To 14	16	8	-
2 ½ To 3	12 To 14	16	8	-
3 To 3 ½	14 To 16	18	9.5	-
3 ½ To 4	14 To 16	18	9.5	-
4 To 5	16 To 18	22	10.5	-
5 To 6	18 AND UP	26	12	-

Table 4.0 - HEIGHT TO SPREAD RATIO FOR CONIFEROUS NURSEY TREES

HEIGHT IN INCHES	SPREAD RANGE IN INCHES
12 To 15	8 To 12
15 To 18	9 To 15
18 To 24	12 To 18
24 To 30	15 To 21
30 To 36	18 To 24
36 To 48	21 To 30
48 To 60	30 To 36
60 To 72	36 To 48

Generally the Height: Spread ratio should be no less than 2:1.

Table 5.0 – CONTAINER SIZE TO RATIO HEIGHT

	DECIDUOUS TREES	CONIFEROUS TREES
	HEIGHT SIZES	
CONTAINER SIZE	**IN FEET**	**IN INCHES**
1 GALLON	1 To 1 ½	6 To 9
5 ½" x 6"	1 ½ To 2	9 To 12
	2 To 3	12 To 15
	3 To 4	15 To 18
		18 To 24
2 GALLON	2 To 3	12 To 15
7"x7 ½"	3 To 4	15 To 18
	4 To 5	18 To 24
		24 To 30
5 GALLON	4 To 5	18 To 24
9" x 10"	5 To 6	24 To 30

	6 To 8	30 To 36
	-	36 To 42
	-	42 To 48

Table 6.0 – MINIMUM ROOT SPREAD AND BALL DIAMETER FOR DECIDUOUS TREES

CALIPER	BARE ROOT DIAMETER SPREAD FOR ALL TREES	BALL DIAMETER FOR STANDARD AND SLOW GROWING BALL AND BURLAP TREES		BALL DIAMETERS FOR SMALL UPRIGHTTREES
INCHES	INCHES	INCHES	HEIGHT IN FEET	DIAMETER INCHES
½ To ¾	12	12	2To3	10
¾ To 1	16	14	3 To 4	12
1 To 1 ¼	18	16	4 To 5	14
1 ½ To 1 ¾	20	18	5 To 6	16
1 ¼ To 1 ½	22	20	6 To 7	18
1 ¾ To 2	24	22	7 To 8	20
2 To 2 ½	28	24	8 To 9	22
2 ½To 3	32	28	9 To 10	24
3 To 3 ½	38	32	10 To 12	26
3 ½ To 4	-	38	-	-
4 To 4 ½	-	42	-	-
4 ½ To 5	-	48	-	-
5 To 5 ½	-	54	-	-

Table 7.0 – RECOMMENDED BALL DIMENSIONS FOR LARGE TREES

TREE DIAMETER	BALL DIAMETER	BALL DEPTH	APPROXIMATE WEIGHT OF BALL AND TREE
INCHES	FEET	INCHES	TONS
5	4	30	1.5
6	5	32	2.4
7	6	34	3.7
8	7	36	5.4
9	7'/2	36	6.2
10	8	38	7.4
11	9	40	9.9
12	10	40	12.2

Table 8.0 – RECOMMENDED MINIMUM BALL DIAMETERS FOR BALL AND BURLAP CONIFEROUS TREES

HEIGHT IN FEET	DIAMETER IN INCHES
1'/2 To 2	10
2 To 3	12
3 To 4	14
4 To 5	16
5 To 6	20
6 To 7	22
7 To 8	24
8 To 9	27
9 To 10	30
10 To 12	34
12 To 14	38
14 To 16	42
18 To 20	50

5. Transplanting Guidelines

a. The transplanting of new trees can result in major injury to their root system. If proper transplanting techniques are employed, conditions will be more favorable for tree recovery, and the rate of attrition for newly planted trees will be reduced.

b. Transplanting procedures shall follow guidelines established by the International Society of Arboriculture in the "Trees and Shrub Transplanting Manual". The following is a summary of several of the more important considerations provided in the manual.

- Pre-Planting Considerations

- Only healthy trees with a well developed root system and a well formed top, characteristic of the species, should be planted. Guidelines for selecting

quality stock are provided in Section C. Revegetation.

- Trees selected for planting must be compatible with the specific site conditions. A site specific tree list will be provided by the City Arborist upon request.

- The ability of a species to regenerate a new root system and to become reestablished should be considered. Deciduous and evergreen trees should be planted between the end of November and February. Trees planted outside of this time period will NOT be accepted by the City of Johns Creek unless a bond is submitted to guarantee their replanting if they die.

c. Planting procedures

- Planting holes should be no less than 1 foot wider than the root ball or bare roots of the tree being planted. A planting hole 3 times the width of the root ball is recommended.

- Trees should not be planted deeper than they were in their former location or container.

- Spade compacted bottom and sides of the planting hole should be roughed or scarified to allow the penetration of developing roots.

- Good water drainage from the bottom of the planting hole is essential for root regeneration.

- Once the transplanted tree is set, the hole should be backfilled with soil of good texture and structure. Traditionally, backfill material is comprised of a mix of native soil, organic matter such as peat, and inorganic material such as pearlite or vermiculite in a 1:1:1 ratio. A back fill with native soil alone is adequate if the soil is of good quality.

- The addition of fertilizer to backfill soil can cause root injury, and is therefore not recommended. If fertilizer must be added, a low rate should be used. Approximately 1.5 pounds of nitrogen per cubic yard of back fill is recommended for bare root plants, and 2.5 pounds of nitrogen per cubic yard of back fill for balled and burlaped trees.

- The back fill should be gently tamped (but not compacted), and soaked for settling.

- The soil should be slightly mounded to allow for settling; a ridge or dike around the perimeter of the hole can facilitate watering.

d. Post-planting procedures

- Pruning. The amount of pruning necessary for newly planted trees depends upon the trees' response to planting. A decrease in leaf surface area from pruning can result in a reduction of the production of food, thus ultimately inhibiting root development. Pruning for vigor or to train young trees should therefore be delayed until after the first growing season.

- Pruning is recommended during the first growing season if the tree is showing "transplant shock" or drought symptoms (wilting), or for the removal of weak, broken, or diseased branches. For correct pruning of trees, always follow the ANSI A300 standard practice for pruning.

- The use of commercially available anti-transpirants is recommended for deciduous trees transplanted while in foliage, if the trees begin to wilt. Anti-transpirants are chemical foliage sprays that reduce water loss through the leaf surface.

- Staking should be used on newly planted trees only where determined necessary. The extent of staking will depend upon tree strength, form and condition at planting, expected wind conditions, the amount of vehicle or foot traffic, and the level of follow-up maintenance. Staking can cause tree damage. Periodic follow-up inspections are required to prevent serious tree-staking problems. Staking should be removed as soon as the tree is capable of providing its own anchorage and support. Recommended types and uses of staking are as follows:
  1. Protective staking is used to provide a barrier from foot traffic, mowers, vehicles, etc., for trees able to stand without support.

  2. Anchor staking is used to hold a root ball in place during the period of reestablishment for trees with otherwise adequate support.

  3. Support staking is used for trees with weak trunks or oversized crowns and unable to stand without support or in wind.

  4. Guying is recommended where necessary for large transplanted trees (4" D.B.H. or greater) to provide both anchorage and support.

  5. Mulching newly planted trees will reduce competition from weeds and moderate soil moisture and temperature extremes.

  6. Fertilizer application should begin after the tree's first full growing season.

  7. Water availability for the newly planted tree should be monitored and adjusted according to the species water requirements and the site conditions.

D. LANDSCAPE STRIP AND BUFFER GUIDELINES

1. Landscape Strips

a. The width of landscape strips must, as a minimum, conform with the requirements of the conditions of zoning or the requirements of the Zoning Ordinance, which ever is greater. The width is measured from the newly dedicated right-of-way, or from the property lines of contiguous parcels, as applicable.

b. No permanent structures are permitted within landscape strips. This includes retaining walls, curbing, dumpsters, detention facilities, etc. Monument signs, drainage structures, and sidewalks may be allowed with pre-approval.

c. Curb stops must be used to prevent vehicle overhang into required landscape strips and parking lot landscape islands. One curb stop per parking stall is required.

d. Signs within required landscape strips are subject to the approval of the Department of Community Development or designated agent(s). These signs may only be located in areas of turf or groundcover and must not conflict with the growth potential of trees and shrubs. Signs are not permitted within required undisturbed buffers.

e. The deposition of storm water runoff into drainage swales through landscape strips is generally not permitted. Exceptions will be considered only if this standard will create an undue hardship to the property owner. Under no circumstances may the width of a drainage easement through a landscape strip exceed the width of the strip.

f. Parking lot landscape islands must, at a minimum, conform to the requirements of the Zoning Ordinance. These islands must be planted with at least one 2 inch caliper (minimum) shade tree. Stormwater runoff into parking lot landscape islands may be permitted upon approval by the City Arborist.

g. When fencing is required as a condition of rezoning, the finished surface of the fence must face externally to the project. The exact location for fence placement within the landscape strip will be determined on a case by case basis by the City Arborist or designated agent(s).

h. All species within required landscape strips must be ecologically compatible with the intended growing site. If ornamental trees are used to satisfy landscape strip requirements, they will not count for satisfying tree density requirements. All plant materials are subject to the Department of Community Development or designated agent(s) approval.

i. Trees within required landscape strips shall be provided as follows:
   1. Landscape strips 25 feet wide or less; a minimum of one tree for every 30 linear feet of landscape strip.
   2. Landscape strips 25 feet wide or more; a minimum of one tree for every 20 linear feet of landscape strip.
   3. Clumping is permitted.

j. All required landscape strips must be designed with at least 60% coverage in trees and shrubs, with no more than 40% coverage in grass or ground cover. Landscape strip coverage will be calculated as follows:

   1. Calculate the total spatial area of the landscape strip.

2. Count the number of trees within the landscape strip and multiply by 100 square feet for trees less than 6" caliper and 200 square feet for trees 6" or greater (This will allow some credit for the spatial coverage of the tree canopy).
3. Calculate the coverage provided by the shrubs planted on center:

ON CENTER	Equals	COVERAGE PER SHRUB
*3 feet	=	9 square feet
*4 feet	=	16 square feet
*5 feet	=	25 square feet

*At maturity, shrubs must attain this width. Shrub species and spacing is subject to Arborist's approval.

4. Grass or ground cover may not exceed 40 % coverage within the strip.

2. Planting Within Rights-of-Way

Approval from the Department of community development, Department of Public Works and the Department of Transportation (D.O.T), where applicable, is required, as planting is generally not permitted in the rights-of-way. Where approval is received, the following conditions must be met:

a. Indemnification and maintenance agreements must be recorded with the City of Johns Creek City Clerk (678) 512-3200 prior to permitting irrigation or planting within City rights-of-way.

- These agreements must be recorded in the name of a homeowner's association (along with documentation attesting to that association's existence), for subdivisions.

- These agreements must be recorded in the property owner's name for all other types of projects.

b. Trees planted within rights-of-way cannot be counted toward the tree density requirement for a site.

- Prior to planting trees in rights-of-way, a shoulder cross-section must be provided indicating the placement of the trees in relation to the curb, and underground utilities. Placement and species are subject to the approval of the City Arborist and the Director of Public Works.

c. Drawings for irrigation system within rights-of-way must indicate the location of lines, heads, spray radius, shut off valves, timers and a 24 hour emergency contact phone number.

3. Buffers

a. Required undisturbed buffers must remain undisturbed and actively protected in perpetuity under the auspices of the Tree Protection Ordinance and Administrative Guidelines.

b. Buffers must be replanted where sparsely vegetated or where disturbed for approved access and utility crossings. The buffers should be replanted to meet the following guidelines:

- Must provide a visual barrier. To accomplish this screening, the plant materials must be a minimum 5 feet in height at time of planting, moderately growing evergreen and have branching all the way to the ground. Slower growing trees may be used if larger materials are planted. All buffer plant materials are subject to the City Arborist or designated agent(s) approval. Please see Appendix J for the list of acceptable evergreen plant material for undisturbed buffers.
- The number of planting rows for tree replacement in buffers is determined by the buffer width:

Buffer Width	Minimum Planting rows
< 20’	2
20’ to 30’	3
31’ to 50’	4
> 50’	4 plus 1 row for each additional 15 feet

- Drainage within or through buffers is subject to the approval of the Department of Community Development or designated agent(s).
- Encroachment into buffers for the construction of retaining walls, footings, or wall supports, is not permitted unless otherwise specified in the conditions of rezoning. Encroachments into buffers shall require zoning modifications or variances as applicable.
- All buffers require a 10 foot improvement setback interior and adjacent to the buffer. No grading is allowed in this improvement setback unless permission is obtained from the Director of the Department of Community Development. (Contact Arborist office for details.)

State Water Buffers

1. The Soil Erosion and Sedimentation Control Ordinance of 2007 as adopted by the City of Johns Creek Mayor and City Council, requires an undisturbed natural buffer extending 50 feet plus a 25 foot impervious setback from the tops of banks on all State Waters. The City of Johns Creek Community Development Department is the official delineator of the State Waters in the City of Johns Creek.

2. Land Disturbance within State Water Buffers is only permitted if a variance is granted. For information about how to apply for a variance, contact the Department of Community Development at (678) 512-3200.

- As part of the land disturbance permit application, the applicant must demonstrate the extent of proposed disturbance, including the general type and extent of vegetation to be removed and replaced.
- The applicant must clearly demonstrate the need for the proposed disturbance.
- Additional information may be required on a case by case basis.
- Tributary Buffer replanting guidelines will be provided upon request. Disturbed areas within the buffer must be replanted to City guidelines using indigenous riparian vegetation.

SECTION IV. ADMINISTRATIVE GUIDELINES FOR COMMERCIAL AND ALL OTHER NON-SINGLE FAMILY RESIDENTIAL DISTRICTS

This set of guidelines shall apply to land uses within The City of Johns Creek Commercial Districts, Multiple Use Districts, Industrial Park Districts, Two Family and Multiple Family Districts, and all other districts other than Agricultural and Single-Family Districts.

A. PROCEDURES

1. Land Disturbance Permits

a. **Step 1.** Application Forms
Filing application forms and obtaining Ordinance and Administrative Guideline information.

b. **Step 2.** Tree Protection Plan
A tree protection plan, (TPP) shall be submitted with other permit drawings as part of the land disturbance permit process. This plan may either be a separate drawing or part of the landscape plan and shall include the following information:

1. Tree Protection Details, detail drawings of tree protection measures and landscape strips (whichever is applicable or both).

- Protective tree fencing.
- Erosion control fencing.
- Tree protection signs.
- Transplanting specifications.
- Tree wells.
- Staking specifications.
- Other applicable drawings.
- Landscape installation plans, planting details, plant list.

2. Spatial Limits

- Definition of spatial limits.
- Limits of land disturbance, clearing, grading and trenching.
- Tree protection zones.
- Specimen trees or stands of trees.
- Areas of revegetation and tree density calculations.
- State waters buffers and/or tributary buffers.

3. Implementation Schedule

- Procedures and schedules for the implementation, installation and maintenance of tree protection measures.

c. **Step 3.** Review Process
These plans shall be reviewed by the City Arborist or his designated agent(s) for conformance with:

- Overlay District Regulations
- City of Johns Creek Zoning Ordinance
- Applicable Zoning, Use Permit and/or Variance Conditions
- Tree Preservation Ordinance & Administrative Guidelines
- Any and all Ordinances and Administrative Guidelines dealing with natural resources

1. Plans will be either approved or returned for revisions.
2. Reasons for denial shall be stated in writing on the tree protection plan.

d. **Step 4.** Tree Protection Measures
All tree protection measures shall be installed by the contractor and then inspected by the City Arborist or designated agent(s) prior to land disturbance.

e. **Step 5.** Land Disturbance Permit
Issuance of the land disturbance permit is contingent upon approval of the Tree Protection Plan.

f. **Step 6.** Follow-up
The City Arborist will conduct follow-up site inspections for enforcement of the Tree Preservation Ordinance and its Administrative Guidelines.

2. Rezoning and Special Use Permits

a. **Step 1.** Application Forms
Filing application forms and obtaining Ordinance and Administrative Guideline information.

b. **Step 2.** Case Review
The City Arborist may conduct a preliminary review of all rezoning cases and special use permit applications.

c. **Step 3.** Field Review
A field review of cases may occur under the following conditions:

1. For community units plans and major development cases.
2. For cases within the Chattahoochee River Corridor.
3. Other cases as determined necessary by the preliminary review.
4. For cases within overlay districts.

d. **Step 4.** Conditions
Conditions to rezoning may be required as found necessary by the preliminary review. These conditions may either be general or specific in nature and will reflect the guidelines or provisions of the Tree Preservation Ordinance and Administrative Guidelines and the Zoning Ordinance.

e. **Step 5.** Verification
Compliance with these conditions will be verified by review of a revised site plan prior to the issuance of a land disturbance permit.

3. Timber Harvesting Permit Requirements For Non Agriculture Land Uses

A timber harvest permit is required when more than 2 acres of land is thinned. If 2 acres or less of land is thinned a timber harvest permit will not be required, but site density still has to be met. Only thinning shall be allowed on property zoned other than AG-1 and shall be conducted only after a timber harvest permit has been approved. This permit does not allow any thinning or disturbance of state water, tributary, or wetland buffers. Any portion of land thinned under this provision is still required to meet the minimum site density of 30 units per acre, which may require replanting some trees.

a. **Step 1.** Application Form and Site Plan
A filled-out timber harvest application form must be accompanied with a site plan.

b. **Step 2.** Application and Site Plan Review
The City Arborist will conduct review of all timber harvesting applications and site plans. The review of applications and site plans will be based on meeting minimum guidelines listed below.

Site Plan Minimum Guidelines

1. Note stating that no stump removal or grading is allowed under this permit;
2. All areas of existing trees shall be shown;
3. All areas of trees to be thinned shall be shown;
4. All areas of tree to be saved shall be shown;
5. All streams, creeks, lakes, wetlands, applicable buffer areas and tree save areas shall be shown;
6. Investigation must be conducted by a forester registered in the state of Georgia. Plan must be designed by a forester registered in the state of Georgia. The plan must be affixed with the forester's registered seal.

Other Minimum Guidelines

Timber Harvesting under this provision shall be in compliance with the following guidelines:

1. State Waters / Tributary Buffers prescribed by the Chattahoochee River Corridor Tributary Protection Area Ordinance and the Soil Erosion and Sedimentation Control Ordinance of 2007.

2. Erosion control prescribed by the Soil Erosion and Sedimentation Control Ordinance of 2007.

3. Stream crossing prescribed by the Soil Erosion and Sedimentation Control Ordinance of 2007.

4. A 25 foot undisturbed buffer shall be provided and maintained along the entire perimeter of the property, including road frontages, during the timber harvesting activity, except for authorized access crossings.

5. The property shall be required to meet a tree density standard of 30 units per acre, not including the 25' buffer, upon completion of the authorized timber harvesting activities.

6. The owner/developer shall utilize the recommended Best Management Practices as established by the Georgia Forestry Commission.
*IMPORTANT NOTE: Concerning the best management practice of SMZ'S, or stream side management zones, no timber harvesting can occur within the 25 foot State Waters Buffer, the 50 foot blueline tributary buffer, or the 75 foot state waters buffer. All buffers are measured from the top of the bank on both sides of a stream or creek that has been delineated by City of Johns Creek as State Waters.

7. As part of the process of obtaining a timber harvest permit on property zoned commercial, industrial, multiple use, or non-single family residential in the City of Johns Creek, it shall be the responsibility of the property owner to notify the Department of Community Development in writing of the following information:

- Location of the property by road name, land lot, district, and address, if any;
- The name, address and phone number of the property owner;
- A letter written by the property owner authorizing timbering or logging operations to be conducted on their property;
- The name, address, and phone number of the logging firm or logger harvesting the timber; and
- The estimated starting and completion dates.

**IMPORTANT NOTE: Large Pine Trees 24" d.b.h. or greater shall be excluded from specimen tree protection requirements in timber harvesting operations on commercial, industrial, multiple use, or non-single family residential zoned land. Specimen hardwood trees, however, will <u>not</u> be excluded and are to be protected with tree fence out to a distance of 3' beyond the edge of their root protection zone.

B. TREE PROTECTION

1. Guidelines For Specimen And Heritage Trees And Stands of Trees

Specimen and Heritage Tree: Any tree in fair or better condition which equals or exceeds the following diameter sizes.

Tree Type	Tree Diameter Size	Examples
Large hardwoods	27”dbh	Oak, hickory, yellow poplar, sweetgum, etc.
Large hardwood	24”dbh	Beech
Large softwoods	24”dbh	Pine, deodar cedar
Small native flowering	10”dbh	Dogwood, redbud, sourwood

A tree in fair or better condition must meet the following minimum guidelines:

a. A life expectancy of greater than 10 years.
b. A relatively sound and solid trunk with no extensive decay or hollow, and less than 20 percent radial trunk dieback.
c. No more than one major and several minor dead limbs (hardwoods only).
d. No major insect or pathological problem.
e. A lesser sized tree can be considered a specimen if it is a rare or unusual species, of exceptional quality, or of historical significance.
f. A lesser size tree can be considered a specimen if it is specifically used by a builder, developer, or design professional as a focal point in a project or landscape.

Specimen Tree Stands: A contiguous grouping of trees which has been determined to be of value by the Director of Community Development or Authorized designee(s). Determination is based upon any one or more of the following criteria:

a. A relatively mature even-aged stand.
b. A stand with purity of species composition or of a rare or unusual nature.
c. A stand of historical significance.
d. A stand with exceptional aesthetic quality.

2. Methods of Tree Protection

a. Planning consideration

Root space is the most critical factor in tree protection throughout the development process. The root system of trees easily goes beyond the dripline of the tree canopy. Disturbance within this root zone can directly affect a tree’s chances for survival. To protect the root zone the following guidelines shall apply:

1. The use of tree save areas is encouraged. This will facilitate overall site organization as related to tree protection.

2. The root protection zone of specimen trees, heritage trees, undisturbed buffers, stands of trees or otherwise designated tree save areas shall include no less than the area of a circle with a radius that extends one foot out for every inch of trunk diameter, or the area of a circle with a radius extending from a tree’s trunk to a point no less than the end of a tree’s longest branch, **whichever is greater**. In some instances, the City Arborist or authorized agent(s) may require an additional area of no disturbance up to 10 feet outside the root protection zone. (See Appendix A. Typical Root Protection Zone)

3. Layout of the project site utility and grading plans must accommodate the required tree protection zones. Utilities must be placed along corridors between protection zones.

4. Construction site activities such as parking, material storage, bury pits, concrete washout, burnhole placement, etc., shall not be allowed within tree protection zones.

5. No disturbance shall occur within the protection zone of specimen and heritage trees or stands of trees.

b. Protective Barriers

1. Protective tree fencing shall be installed a minimum of 3 feet beyond the outer edge of the root protection zone for all specimen trees, heritage trees, stands of trees, or otherwise designated tree protection zones, **prior to any land disturbance**.

2. Acceptable Tree Fencing Procedures
   - A minimum of 4 feet high, constructed in a post and rail configuration. A 2 inch x 4 inch post and a double 1 inch x 4 inch rail is recommended.
   - Four foot orange polyethylene laminar safety fencing.
   - Any deviation from the two acceptable tree fencing methods listed above must be authorized by the City Arborist or designated agent(s).
   - All tree protection fences must be accompanied by "Stay Out" and "Tree Save" signage. Tree protection signs are available at the City of Johns Creek City hall in the Department of Community Development for $3.00 each.

3. A stop work order or notice of violation will be issued if project is found to be out of compliance with the Tree Protection Plan.

4. All specimen trees, heritage trees, stands of trees or otherwise designated tree protection zones must be protected from silt.
   - Silt fencing reinforced with wire mesh fencing must be placed along the outer uphill edge of tree protection zones at the land disturbance interface.
   - Silt fencing should be backed by 12 gauge, 2 inch x 4 inch wire mesh fencing in areas of steep slope. (Steep slopes are defined as greater than 3H:1 V).
   - All erosion control measures must comply with City of Johns Creek Erosion Control Guidelines.

5. All tree fencing and erosion control barriers must be installed prior to and maintained throughout the land disturbance process and building construction and may not be removed until the certificate of occupancy is approved and issued by the Director of the Department of Community Development or a designated agent(s).

C. REVEGETATION

1. Tree Replacement

a. The replacement of trees to satisfy the conditions of zoning, requirements of the City of Johns Creek Zoning Ordinance or the Tree Preservation Ordinance and Administrative Guidelines, may occur under the following situations:

- To establish the minimum tree density requirements for the site, where grading occurs outside the buildable area of the lot.
- If the lot's buildable area leaves no protected zone.
- If no trees are present within an existing protected zone.
- Where specimen trees or stands of trees and trees within otherwise designated tree protective zones have been irreparably damaged or removed through land disturbance or construction activities.

NOTE: Unless enough existing trees are saved on site to satisfy density requirements, proposed replacement trees will have to be bonded off prior to issuance the land disturbance permit

b. The quantity of replacement trees into a site must be sufficient so as to produce a total site-tree density factor of no less than 30 units per acre. If it has been determined by the City Arborist or designated agent(s) during the initial site visit that the property in question is completely barren of trees and has been for a long time (ie, pasture land), then the units for replacement trees will be doubled.

(For example, a 4 inch replacement tree is currently equivalent to 0.7 units, at a site where it is determined to be barren of trees, the replacement units will be equivalent to 1.4 instead of 0.7 units.) The site will still be required to meet the 30 unit per acre site tree density requirement.

(Note: the terms unit and tree are NOT interchangeable). Procedures for determining the site density requirements and the subsequent tree replacement requirements are provided in Table 1.0 and Table 2.0 in the next section. No more than 30% of replacement trees can be pines. At least 70% of replacement trees must be hardwoods of at least 4 different species.

c. The spacing of replacement trees must be compatible with spatial limitations and with responsible consideration towards potential species size.

d. Where the City Arborist or designated agent(s) has determined that site spatial constraints result in the inability to provide for all the required trees, as many trees as possible must be planted on site. The remaining balance of required trees must be planted on public properties using the **Tree Bank** alternative or the installed cost of the remaining balance of required trees must be contributed to the **Tree Replacement Fund** in the form of a certified check. A **Conservation Easement** on a greenspace can also be deeded to the City as compensation for specimen trees removed or to meet site tree density. (Contact senior arborist for details on conservation easement.)

2. Specimen Tree Recompense

a. Any and all healthy specimen trees that the City of Johns Creek Arborist allows a developer/builder/homeowner to remove must be compensated for. Specimen hardwood trees have to be compensated for with either 2" or 4" caliper hardwood trees. Specimen evergreen trees have to be compensated for with either 2" or 4" caliper Southern Magnolias, Deodar Cedars, Canadian Hemlocks, or Cryptomerias. Specimen native flowering trees have to be compensated for with either 2" or 4" caliper hardwood trees. Four (4) different species (minimum) of recompense trees must be used if the number of recompense trees required is forty (40) or greater. For purposes of recompense trees **only**, the unit value of a 2" caliper *recompense* tree will be **.35** units, not its usual **.5** unit value. Any and all specimen trees that are slated for removal must have their recompense trees bonded off prior to issuance of the land disturbance permit.

If a specimen tree or trees are removed without permission or the City Arborist determines that the damage to the root protection zone of a specimen tree results in a specimen tree having less than a 50% chance of surviving for two (2) years, the unit value of the specimen tree is doubled and that becomes the unit value that must be compensated for. For example: A 30" DBH tree is normally worth 14.7 units. If it is removed or its root protection zone disturbed without permission its unit value will double to 29.4 units. Thus 29.4 units of 2" or 4" caliper trees will have to be replaced at the project site. Recompense trees **cannot** be used to satisfy any other landscape requirement such as parking lot shade trees, landscape strip, undisturbed buffer or detention pond buffer trees. They can, however, count toward the required tree density for the site. 2" caliper recompense trees that are counted for density will be worth .35 units per tree.

If the root protection zone of a specimen tree is disturbed without permission, and the City Arborist has determined that the tree has a greater than 50% chance of surviving for two years, and the violator has submitted an acceptable prescription for continued maintenance of the endangered tree, then 50% of the unit value of the specimen tree is the unit value that must be compensated for. The recompense generated shall be divided equally with 50% of the recompense amount deposited into the Tree Replacement Fund and 50% of the recompense amount deposited into an escrow account. The half deposited into the Tree Replacement Fund is forfeited as restitution for the encroachment of the root protection zone; the half deposited into the escrow account shall be returned to the violator after a period of two (2) years with the submittal and acceptance by the City Arborist of an affidavit by the certified arborist certifying that the tree has not declined beyond the natural aging process or that no other decline has occurred which could have been prevented by the property owner. The violator will have one (1) year following the end of the aforementioned two (2) year period to make application to the City for fund deposited into the escrow account. In the event no application is made within the one (1) year period, the amount placed in escrow will be forfeited to the Tree Replacement Fund.

TREE BANK

Arrangements will be made through the City Arborist. If the tree bank is an alternative for your development, then the following criteria must be observed:

- The tree bank site location must be in the same planning area of the city (defined in the Comprehensive Plan) as the project site.
- Four different species needed if total quantity of trees to be banked is 40 or greater.
- Each tree bank tree must be 2 inch caliper size at a minimum; 2 inch or 4 inch caliper required for recompense trees.
- All tree bank trees must be grade "A" quality trees with straight trunks and dense foliage and free from injury, pests, disease or nutritional disorders.
- All tree bank trees are to be guaranteed for 1 full year after planting by the developer. Any trees that die within this time period must be replaced by the developer.
- The following notes must be shown on the approved tree protection plan:

WHEN THE OWNER/DEVELOPER/CONTRACTOR CALLS THE ARBORIST'S OFFICE (678) 512-3290 FOR A FINAL INSPECTION, THE OWNER/DEVELOPER/ CONTRACTOR SHALL INFORM THE ARBORIST THAT THE SITE VISIT INCLUDES A SITE VISIT TO A PUBLIC PROPERTY TO INSPECT TREES THAT HAVE BEEN TREE BANKED.

ANY CHANGES IN TREE VARIETY MUST BE APPROVED IN WRITING BY THE CITY OF JOHNS CREEK ARBORIST OFFICE AT (678) 512-3290.

PLANTING MUST BE COMPLETED BY THE OWNER/DEVELOPER AND THE PLANTING MUST BE INSPECTED AND APPROVED BY THE CITY OF JOHNS CREEK ARBORIST PRIOR TO THE ARBORIST'S SIGN-OFF ON THE CERTIFICATE OF OCCUPANCY OR FINAL PLAT RECORDING FOR THE PROJECT.

TREE REPLACEMENT FUND

Arrangements will be made through the City Arborist. If the tree banking alternative is not desirable, then the tree replacement fund is another alternative to help your development meet its tree density or recompense tree requirements. If the Tree Replacement Fund is an alternative for your development, then the following criteria must be observed:

- Tree replacement cost estimates obtained from three landscape contractors must be provided to City of Johns Creek Arborist for approval and the trees replacement cost will be based on an average of the three estimates.
- The required replacement fee will be 100 percent (%) of the total cost to plant the balance of trees that were unable to be planted to satisfy the site density requirement or recompense tree requirements.
- Species selected for replacement must be grade "A" quality, healthy trees and must be ecologically compatible with the specifically intended growing site. Guidelines for transplanting and selecting quality replacement stock are provided in Transplanting Guidelines Section. A site specific tree list will be provided by the City Arborist upon request.

2. Procedures for Calculating the Required Tree Replacement Density Factors
The Tree Density Factor Requirement for property located within Commercial Business Districts is 30 units per acre.

Step 1
Calculate the density factor for the site (DFS) by multiplying the number of site acres by 30.
EXAMPLE: A 2.2 acre site has a DFS of 2.2 x 30= 66.

Step 2
Calculate the existing density factor (EDF) of trees which will remain on site to be protected during construction. EDF is determined by converting the D.B.H. of individual existing trees to density factor units, using Table 1.0. These units are then totaled to determine the EDF for the site.

EXAMPLE: A total of 15 trees will remain on the 2.2 acre site in Step 1. When converted to density factor units using Table 1.0, we arrive at the
These trees include:

quantity	size	tree type
7	12"	pine
3	14"	pine
3	18"	oak
1	20"	hickory
1	30"	Oak

D.B.H.	UNITS		#TREES		
12"	3.2	X	7	=	22.4
14"	3.6	X	13	=	10.8
18"	4.0	X	13	=	12
20"	4.0	X	1	=	4.0
30"	14.7	X	1	=	14.7
				EDF total	63.9

The sum total of units, 63.9, is the EFD, existing density factor.

Step 3
Calculate the required replacement density factor (RDF) by subtracting the EDF (Step 2) from the DFS (Step 1).
Example:

RDF	=	DFS	-	EDF
RDF	=	66	-	63.9
RDF	=	2.10		

Step 4
The RDF can be converted back to caliper inches using Table 2.0. Any number or combination of transplantable size trees can be used so long as their total density factor units will equal or exceed the RDF.

Example: On the 2.2 acre site the following number and size of trees will be planted:

No.	Size	Species	Density Factor Units	DF x Number =	Total
5	2"	RED MAPLE	0.50	5 x 0.50 =	2.50
				Replacement density factor < or	2.50

2.50 is greater than the RDF of 2.10, thus the minimum requirements have been met.

Conversion Tables

TABLE 1.0 – EXISTING TREES TO REMAIN

Conversion from D.B.H. to density factor units for trees remaining on the site.

D.B.H.	Units	D.B.H.	Units	D.B.H.	Units
1-4	0.4	36	21.3	59	56.9
5-7	1.2	37	22.5	60	58.9
8-9	2.0	38	23.7	61	60.8
10	2.4	39	24.9	62	62.8
11	2.8	40	26.1	63	64.9
12	3.2	41	27.6	64	67.0
13-15	3.6	42	28.8	65	69.1
16-20	4.0	43	30.3	66	71.2
21	4.8	44	31.8	67	73.4
22	5.2	45	33.0	68	75.6
23	8.7	46	34.5	69	77.9
24	9.3	47	36.0	70	80.1
25	10.2	48	37.8	71	82.4
26	11.1	49	39.3	72	84.8
27	12.0	50	40.8	73	87.1
28	12.9	51	42.7	74	89.6
29	13.8	52	44.2	75	92.0
30	14.7	53	45.9	76	94.5
31	15.6	54	47.7	77	97.0
32	16.8	55	49.4	78	99.5
33	17.7	56	51.3	79	102.1
34	18.9	57	53.1	80	104.7
35	20.1	58	55.0		

TABLE 2.0 – REPLACEMENT TREES

Conversion from caliper to density factor units for replacement trees.

CALIPER	UNITS	CALIPER	UNITS
1	0.40	8	1.30
2	0.50	9	1.50
3	0.60	10	1.70
4	0.70	11	1.90
5	0.90	12	2.10
6	1.00	13	2.30
7	1.20	14	2.50

Container grown pine trees are given replacement credit as follows:

SIZE	UNITS
7 Gallon	0.4
3 Gallon*	0.2

The use of 3 gallon pines is permitted only with prior approval

Tree relocation: Replacement units may be granted to trees relocated on site. Tree relocation is subject to the Senior Arborist's or designated agent(s) approval.

3. Guidelines for Selecting Quality Replacement Stock

a. Trees selected for planting must meet the minimum requirements as provided in, Tables 3.0 through 8.0 provided at the end of this section.

b. Trees selected for planting must be free from injury, pests, disease, or nutritional disorders.

c. Trees selected for planting must be of good vigor. The determination of vigor is a subjective evaluation and dependent upon species variability. The following criteria are generally used for the determination of vigor:

1. Foliage should have a green or dark green color. Vigorous trees will have large leaves and dense foliage when compared to trees with poor vigor.

2. Shoot growth for most vigorous trees will be at least 1 foot per year. At least ½ of the branches should arise from points on the lower 2/3 of a trunk.

3. Bark texture can denote vigor. Smooth or shiny bark on the trunk and branches of a young tree usually signifies good vigor, conversely, rough and dull bark could indicate poor vigor.

4. Trunk taper: the trunks of vigorous trees will generally have an increase in diameter with a decrease in height. Trees with reverse tapers or no taper should be avoided.

5. Root color: young roots of most trees will be light in color.

d. Trees selected for planting must be free of root defects. Two types of root defects generally occur:

1. Kinked roots, in which taproots, major branch roots, or both are bent more than 90 degrees with less than 20 percent of the root system originating above the kink. A tree with such roots will probably bend at the soil line when released from a supporting stake.

2. Circling or girdling roots which circle 80 percent or more of the root system by 360 degrees or more. A tree with such roots would ultimately have less than 20 percent of its system available for support.

4. Planting Minimum Requirement Tables

Table 3.0 - CALIPER TO HEIGHT RATIOS FOR DECIDUOUS TREES

STANDARD SHADE TREES		SLOW GROWING TREES		SMALL UPRIGHT
CALIPER IN INCHES	AVERAGE RANGE	MAXIMUM / MINIMUM		AVERAGE RANGE
	HEIGHT IN FEET	HEIGHT IN FEET		HEIGHT IN FEET
5/16	-	-		2 To 3
7/16	-	-		3 To 4
9/16	-	-		4 To 5
11/16	-	-		5 To 6
7/8	-	-		6 To 8
½ To ¾	5 To 6	8	3.5	-
¾ To 1	6 To 8	10	4	-
1 To ¼	8 To 10	11	5.5	-
1 1/4 To 1 ½	8 To 10	12	6.5	-
1 ½ To 1 ¾	10 To 12	14	6.5	-
1 ¾ To 2	10 To 12	14	6.5	-
2 To 2 ½	12 To 14	16	8	-
2 ½ To 3	12 To 14	16	8	-
3 To 3 ½	14 To 16	18	9.5	-
3 ½ To 4	14 To 16	18	9.5	-
4 To 5	16 To 18	22	10.5	-
5 To 6	18 AND UP	26	12	-

Table 4.0 - HEIGHT TO SPREAD RATIO FOR CONIFEROUS NURSEY TREES

HEIGHT IN INCHES	SPREAD RANGE IN INCHES
12 To 15	8 To 12
15 To 18	9 To 15
18 To 24	12 To 18
24 To 30	15 To 21
30 To 36	18 To 24
36 To 48	21 To 30
48 To 60	30 To 36
60 To 72	36 To 48

Generally the Height: Spread ratio should be no less than 2:1.

Table 5.0 – CONTAINER SIZE TO RATIO HEIGHT

	DECIDUOUS TREES	CONIFEROUS TREES
	HEIGHT SIZES	
CONTAINER SIZE	**IN FEET**	**IN INCHES**
1 GALLON	1 To 1 ½	6 To 9
5 ½" x 6"	1 ½ To 2	9 To 12
	2 To 3	12 To 15
	3 To 4	15 To 18
		18 To 24
2 GALLON	2 To 3	12 To 15
7"x7 ½"	3 To 4	15 To 18
	4 To 5	18 To 24
		24 To 30
5 GALLON	4 To 5	18 To 24
9" x 10"	5 To 6	24 To 30
	6 To 8	30 To 36
	-	36 To 42
	-	42 To 48

Table 6.0 – MINIMUM ROOT SPREAD AND BALL DIAMETER FOR DECIDUOUS TREES

CALIPER	BARE ROOT DIAMETER SPREAD FOR ALL TREES	BALL DIAMETER FOR STANDARD AND SLOW GROWING BALL AND BURLAP TREES		BALL DIAMETERS FOR SMALL UPRIGHTTREES
INCHES	INCHES	INCHES	HEIGHT IN FEET	DIAMETER INCHES
½ To ¾	12	12	2To3	10
¾ To 1	16	14	3 To 4	12
1 To 1 ¼	18	16	4 To 5	14
1 ½ To 1 ¾	20	18	5 To 6	16
1 ¼ To 1 ½	22	20	6 To 7	18
1 ¾ To 2	24	22	7 To 8	20
2 To 2 ½	28	24	8 To 9	22
2 ½To 3	32	28	9 To 10	24
3 To 3 ½	38	32	10 To 12	26
3 ½ To 4	-	38	-	-
4 To 4 ½	-	42	-	-
4 ½ To 5	-	48	-	-
5 To 5 ½	-	54	-	-

Table 7.0 – RECOMMENDED BALL DIMENSIONS FOR LARGE TREES

TREE DIAMETER	BALL DIAMETER	BALL DEPTH	APPROXIMATE WEIGHT OF BALL AND TREE
INCHES	FEET	INCHES	TONS
5	4	30	1.5
6	5	32	2.4
7	6	34	3.7
8	7	36	5.4
9	7'/2	36	6.2
10	8	38	7.4
11	9	40	9.9
12	10	40	12.2

Table 8.0 – RECOMMENDED MINIMUM BALL DIAMETERS FOR BALL AND BURLAP CONIFEROUS TREES

HEIGHT IN FEET	DIAMETER IN INCHES
1'/2 To 2	10
2 To 3	12
3 To 4	14
4 To 5	16
5 To 6	20
6 To 7	22
7 To 8	24
8 To 9	27
9 To 10	30
10 To 12	34
12 To 14	38
14 To 16	42
18 To 20	50

5. Transplanting Guidelines

a. The transplanting of new trees can result in major injury to their root system. If proper transplanting techniques are employed, conditions will be more favorable for tree recovery, and the rate of attrition for newly planted trees will be reduced.

b. Transplanting procedures shall follow guidelines established by the International Society of Arboriculture in the "Trees and Shrub Transplanting Manual". The following is a summary of several of the more important considerations provided in the manual.

- Pre-Planting Considerations

- Only healthy trees with a well developed root system and a well formed top, characteristic of the species, should be planted. Guidelines for selecting quality stock are provided in Section C. Revegetation.

- Trees selected for planting must be compatible with the specific site conditions. A site specific tree list will be provided by the City Arborist upon request.

- The ability of a species to regenerate a new root system and to become reestablished should be considered. Deciduous and evergreen trees should be planted between the end of November and February. Trees planted outside of this time period will NOT be accepted by City of Johns Creek unless a bond is submitted to guarantee their replanting if they die.

c. Planting procedures

- Planting holes should be no less than 1 foot wider than the root ball or bare roots of the tree being planted. A planting hole 3 times the width of the root ball is recommended.

- Trees should not be planted deeper than they were in their former location or container.

- Spade compacted bottom and sides of the planting hole should be roughed or scarified to allow the penetration of developing roots.

- Good water drainage from the bottom of the planting hole is essential for root regeneration.

- Once the transplanted tree is set, the hole should be backfilled with soil of good texture and structure. Traditionally, backfill material is comprised of a mix of native soil, organic matter such as peat, and inorganic material such as pearlite or vermiculite in a 1:1:1 ratio. A back fill with native soil alone is adequate if the soil is of good quality.

- The addition of fertilizer to backfill soil can cause root injury, and is therefore not recommended. If fertilizer must be added, a low rate should be used. Approximately 1.5 pounds of nitrogen per cubic yard of back fill is recommended for bare root plants, and 2.5 pounds of nitrogen per cubic yard of back fill for balled and burlaped trees.

- The back fill should be gently tamped (but not compacted), and soaked for settling.

- The soil should be slightly mounded to allow for settling; a ridge or dike around the perimeter of the hole can facilitate watering.

d. Post-planting procedures

- Pruning. The amount of pruning necessary for newly planted trees depends upon the trees' response to planting. A decrease in leaf surface area from pruning can result in a reduction of the production of food, thus ultimately inhibiting root development. Pruning for vigor or to train young trees should therefore be delayed until after the first growing season.

- Pruning is recommended during the first growing season if the tree is showing "transplant shock" or drought symptoms (wilting), or for the removal of weak, broken, or diseased branches. For correct pruning of trees, always follow the ANSI A300 standard practice for pruning.

- The use of commercially available anti-transpirants is recommended for deciduous trees transplanted while in foliage, if the trees begin to wilt. Anti-transpirants are chemical foliage sprays that reduce water loss through the leaf surface.

- Staking should be used on newly planted trees only where determined necessary. The extent of staking will depend upon tree strength, form and condition at planting, expected wind conditions, the amount of vehicle or foot traffic, and the level of follow-up maintenance. Staking can cause tree damage. Periodic follow-up inspections are required to prevent serious tree-staking problems. Staking should be removed as soon as the tree is capable of providing its own anchorage and support. Recommended types and uses of staking are as follows:
  1. Protective staking is used to provide a barrier from foot traffic, mowers, vehicles, etc., for trees able to stand without support.

  2. Anchor staking is used to hold a root ball in place during the period of reestablishment for trees with otherwise adequate support.

  3. Support staking is used for trees with weak trunks or oversized crowns and unable to stand without support or in wind.

  4. Guying is recommended where necessary for large transplanted trees (4" D.B.H. or greater) to provide both anchorage and support.

  5. Mulching newly planted trees will reduce competition from weeds and moderate soil moisture and temperature extremes.

  6. Fertilizer application should begin after the tree's first full growing season.

  7. Water availability for the newly planted tree should be monitored and adjusted according to the species water requirements and the site conditions.

D. LANDSCAPE STRIP AND BUFFER GUIDELINES

1. Landscape Strips

a. The width of landscape strips must, as a minimum, conform with the requirements of the conditions of zoning or the requirements of the Zoning Ordinance, which ever is greater. The width is measured from the newly dedicated right-of-way, or from the property lines of contiguous parcels, as applicable.

b. No permanent structures are permitted within landscape strips. This includes, retaining walls, curbing, dumpsters, detention facilities, etc. Monument signs, drainage structures, and sidewalks may be allowed with pre-approval.

c. Curb stops must be used to prevent vehicle overhang into required landscape strips and parking lot landscape islands. One curb stop per parking stall is required.

d. Signs within required landscape strips are subject to the approval of the Department of Community Development or designated agent(s). These signs may only be located in areas of turf or groundcover and must not conflict with the growth potential of trees and shrubs. Signs are not permitted within required undisturbed buffers.

e. The deposition of storm water runoff into drainage swales through landscape strips is generally not permitted. Exceptions will be considered only if this standard will create an undue hardship to the property owner. Under no circumstances may the width of a drainage easement through a landscape strip exceed the width of the strip.

f. Parking lot landscape islands must, at a minimum, conform to the requirements of the Zoning Ordinance. These islands must be planted with at least one 2 inch caliper (minimum) shade tree. Stormwater runoff into parking lot landscape islands may be permitted upon approval by the City Arborist.

g. When fencing is required as a condition of rezoning, the finished surface of the fence must face externally to the project. The exact location for fence placement within the landscape strip will be determined on a case by case basis by the City Arborist or designated agent(s).

h. All species within required landscape strips must be ecologically compatible with the intended growing site. If ornamental trees are used to satisfy landscape strip requirements, they will not count for satisfying tree density requirements. All plant materials are subject to Department of Community Development or designated agent(s) approval.

i. Trees within required landscape strips shall be provided as follows:
   1. Landscape strips 25 feet wide or less; a minimum of one tree for every 30 linear feet of landscape strip.
   2. Landscape strips 25 feet wide or more; a minimum of one tree for every 20 linear feet of landscape strip.
   3. Clumping is permitted.

j. All required landscape strips must be designed with at least 60% coverage in trees and shrubs, with no more than 40% coverage in grass or ground cover. Landscape strip coverage will be calculated as follows:

1. Calculate the total spatial area of the landscape strip.
2. Count the number of trees within the landscape strip and multiply by 100 square feet for trees less than 6" caliper and 200 square feet for trees 6" and greater (This will allow some credit for the spatial coverage of the tree canopy).
3. Calculate the coverage provided by the shrubs planted on center:

ON CENTER	Equals	COVERAGE PER SHRUB
*3 feet	=	9 square feet
*4 feet	=	16 square feet
*5 feet	=	25 square feet

*At maturity, shrubs must attain this width. Shrub species and spacing is subject to Arborist's approval.

4. Grass or ground cover may not exceed 40 % coverage within the strip.

2. Planting Within Rights-of-Way

Approval from the Department of community development, Department of Public Works and the Department of Transportation (D.O.T), where applicable, is required, as planting is generally not permitted in the rights-of-way. Where approval is received, the following conditions must be met:

a. Indemnification and maintenance agreements must be recorded with the City of Johns Creek City Clerk (678) 512-3200 prior to permitting irrigation or planting within City rights-of-way.

- These agreements must be recorded in the name of a homeowner's association (along with documentation attesting to that association's existence), for subdivisions.

- These agreements must be recorded in the property owner's name for all other types of projects.

b. Trees planted within rights-of-way cannot be counted toward the tree density requirement for a site.

- Prior to planting trees in rights-of-way, a shoulder cross-section must be provided indicating the placement of the trees in relation to the curb, and underground utilities. Placement and species are subject to the approval of the City Arborist and / or the Director of Public Works.

c. Drawings for irrigation system within rights-of-way must indicate the location of lines, heads, spray radius, shut off valves, timers and a 24 hour emergency contact phone number.

3. Buffers

a. Required undisturbed buffers must remain undisturbed and actively protected in perpetuity under the auspices of the Tree Protection Ordinance and Administrative Guidelines.

b. Buffers must be replanted where sparsely vegetated or where disturbed for approved access and utility crossings. The buffers should be replanted to meet the following guidelines:

- Must provide a visual barrier. To accomplish this screening, the plant materials must be a minimum 5 feet in height at time of planting, moderately growing evergreen and have branching all the way to the ground. Slower growing trees may be used if larger materials are planted. All buffer plant materials are subject to the City Arborist or designated agent(s) approval. Please see Appendix J for the list of acceptable evergreen plant material for undisturbed buffers.
- The number of planting rows for tree replacement in buffers is determined by the buffer width:

Buffer Width	Minimum Planting rows
<20’	2
20’ to 30’	3
31’ to 50’	4
> 50’	4 plus 1 row for each additional 15 feet

- Drainage within or through buffers is subject to the approval of the Department of Community Development or designated agent(s).
- Encroachment into buffers for the construction of retaining walls, footings, or wall supports, is not permitted unless otherwise specified in the conditions of rezoning. Encroachments into buffers shall require zoning modifications or variances as applicable.
- All buffers require a 10 foot improvement setback interior and adjacent to the buffer. No grading is allowed in this improvement setback unless permission is obtained from the Director of the Department of Community Development. (Contact Arborist office for details.)

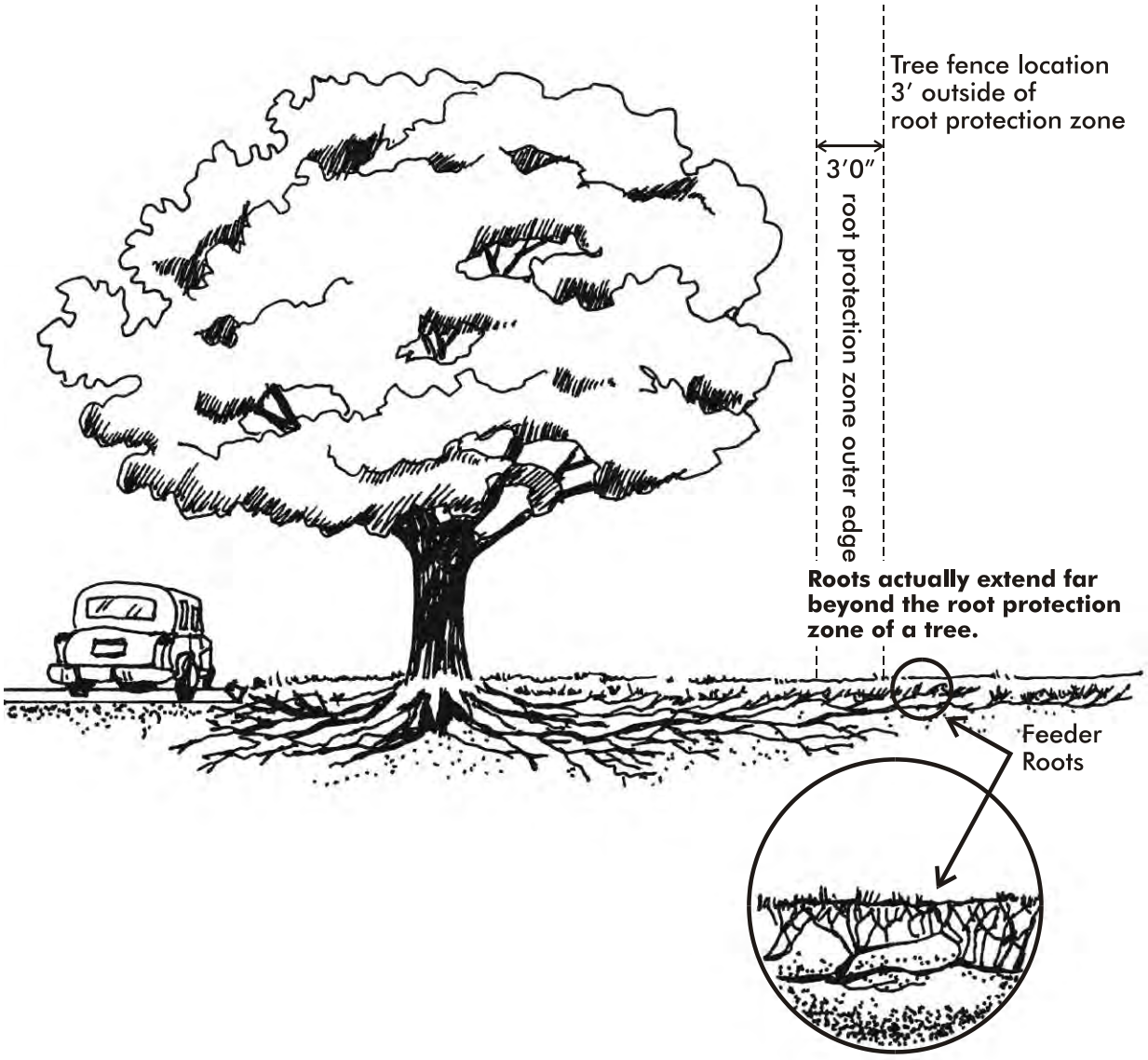
State Water Buffers

1. The Soil Erosion and Sedimentation Control Ordinance of 2007 as adopted by the City of Johns Creek Mayor and City Council, requires an undisturbed natural buffer extending 50 feet plus a 25 foot impervious setback from the tops of banks on all State Waters. The City of Johns Creek Community Development Department is the official delineator of State Waters in the City of Johns Creek.

2. Land Disturbance within State Water Buffers is only permitted if a variance is granted. For information about how to apply for a variance, contact the Department of Community Development at (678) 512-3200.

- As part of the land disturbance permit application, the applicant must demonstrate the extent of proposed disturbance, including the general type and extent of vegetation to be removed and replaced.
- The applicant must clearly demonstrate the need for the proposed disturbance.
- Additional information may be required on a case by case basis.
- Tributary Buffer replanting guidelines will be provided upon request. Disturbed areas within the buffer must be replanted to City guidelines using indigenous riparian vegetation.

APPENDIX A. Typical Root Protection Zone

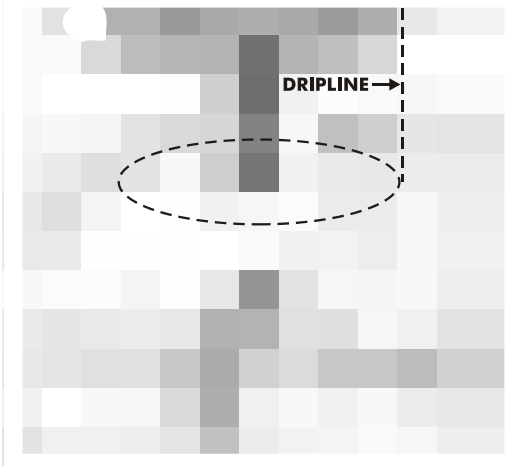


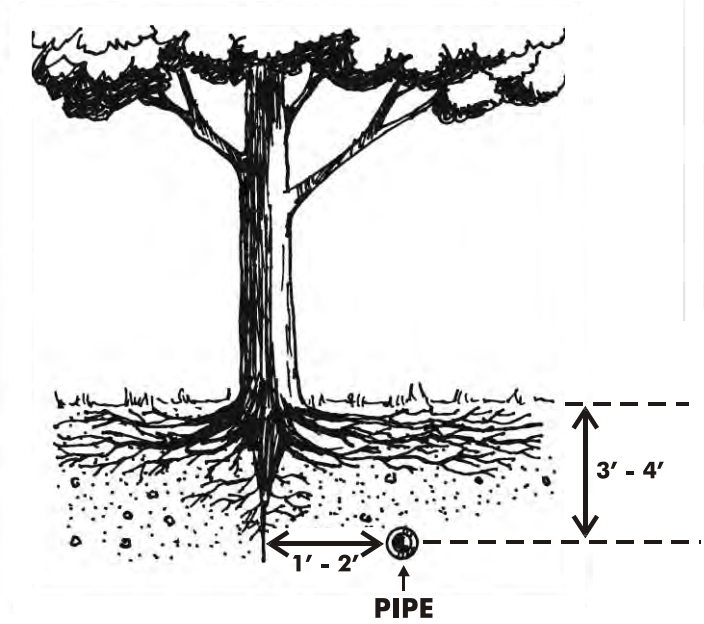
This is a cross section of a typical root zone for a deciduous tree. 85% of roots are within the top 18″ of the soil. Roots spread amazingly far from the trunk. They typically spread up to 2 times the height of the tree and sometimes farther! However, the essential mass of roots is usually found within the ***ROOT PROTECTION ZONE***.

The root protection zone is a zone defined as (1) a circle with a radius that extends one foot out for every inch of trunk diameter, or (2) a circle with a radius extending from a tree's trunk to a point no less than the end of a tree's longest branch, ***whichever is greater***.

APPENDIX B. Tunneling (How to Save Existing Trees When Tunneling)

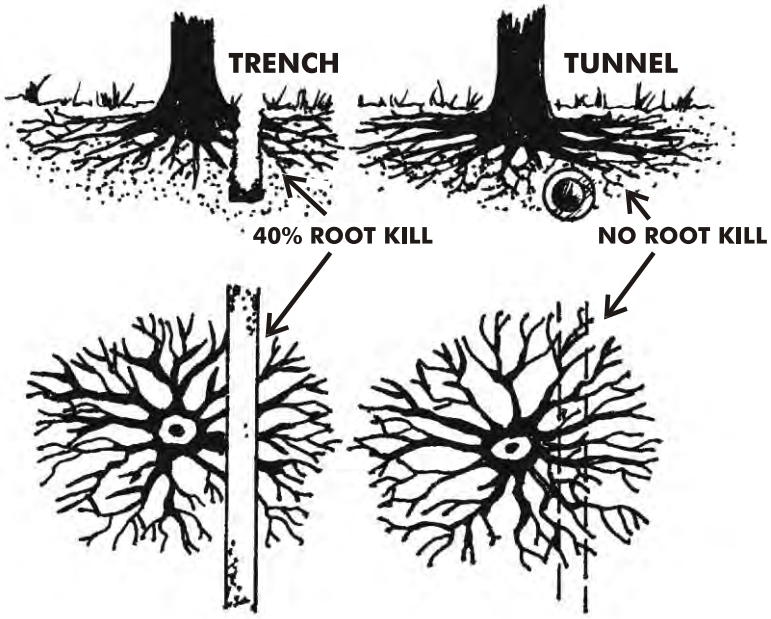
Use tunneling for underground utilities such as cable, electric, and natural gas instead of cutting an open trench. This method will help preserve existing trees or smaller tree save areas.





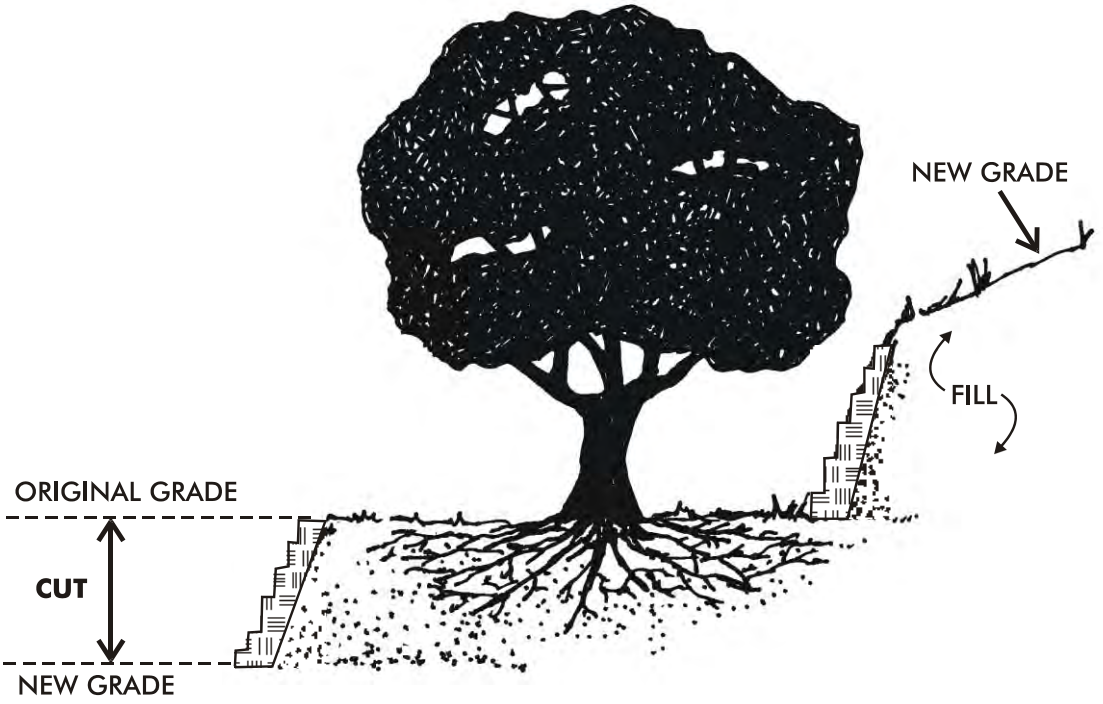
Why Tunneling Saves Trees

Trenching near a tree can kill as much as 40 to 50 percent of the tree's roots. This will almost certainly lead to stress, poor health, lack of firmness against wind, or outright death. A tunnel in the same place will do virtually no damage to the tree.

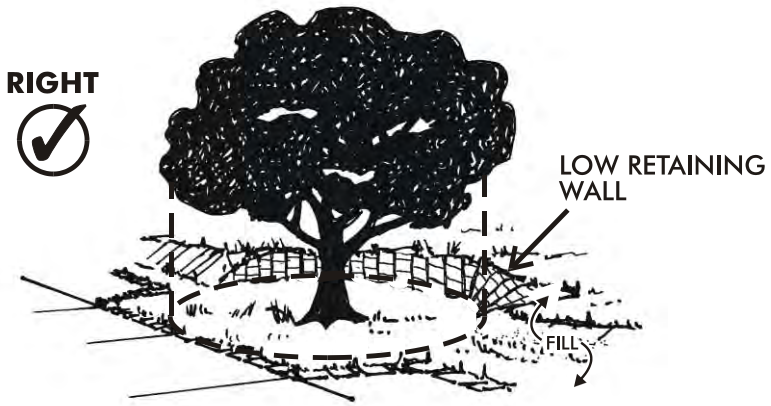


APPENDIX C. Grade Changes

How to preserve existing trees with the use of retaining walls when grade changes are necessary



Grade Change Examples - Methods of preventing root suffocation from fill dirt when changing grade



APPENDIX D. Check List For Landscape Drawings & Tree Protection Plans

Landscape Drawings (generally used for commercial zoned projects) shall have a separate sheet submitted with the landscape plan, to include:

- All required undisturbed buffers, landscape strips, parking islands, and state water (streams, lakes, river, etc ...) and tributary buffers with the required dimensions.
- Planting schedules with proposed plant material names (common and botanical), quantity, size, and any special planting notes.
- Planting and staking details.
- Location of proposed irrigation systems, if applicable.
- Drawings for irrigation systems within the rights-of-ways must show the locations of lines, heads, spray radius, timers, and an emergency 24 hour contact number.
- All required landscape strips must be planted at a density so as to provide at least 60% spatial coverage of trees and shrubs.
- Parking islands must be planted with shade trees. (Minimum 2 inch caliper) Permanent structures cannot be permitted in landscape strips, landscape islands, or buffers; including, but not limited to, headwalls, drop inlets, catch basins, rip-rap, light fixtures, phone booths, etc.
- Curb stops must be used to prevent vehicle overhang into required landscape strips and parking islands. One curb stop per parking stall is required.
- The following notes shall be indicated on all landscape plans in large letters:

    1) ALL LANDSCAPING SHALL BE IN PLACE PRIOR TO THE CONNECTION OF PERMANENT POWER OR RECORDING OF A FINAL PLAT.

    2) CONTACT THE DEPARTMENT OF COMMUNITY DEVELOPMENT AT (678) 512-3200 FOR A SITE INSPECTION UPON COMPLETION OF LANDSCAPE INSTALLATION.

    3) IF THE LANDSCAPE DESIGN OR PLANT MATERIAL ARE CHANGED IN ANY WAY FROM THE CITY OF JOHNS CREEK PERMITTED PLAN, YOU SHALL SUBMIT TWO SETS OF REVISED PLANS TO THE CITY OF JOHNS CREEK ARBORIST'S OFFICE FOR APPROVAL PRIOR TO ANY LANDSCAPE INSTALLATION.

Tree Protection Plans (generally used for residential zoned projects)

1. Provisions for tree protection on the site shall be, at a minimum, in conformance with the requirements of the City of Johns Creek Tree Preservation Ordinance and the Department of Community Development Administrative Guidelines pertaining to tree protection.

2. A tree protection plan shall be submitted either as part of the landscape plan or as a separate drawing to include the following:

   - All tree protection zones and areas of revegetation.
   - Ground-run survey location of all specimen trees and State Waters, including spring heads.
   - Indicate those specimen trees to be removed. Removal of specimen trees or disturbance of root protection zone is subject to the approval of the Department of community development or designated agent(s).
   - Limits of clearing and land disturbance such as grading, trenching, etc. where these disturbances may affect tree protection zones.
   - Proposed location of underground utilities.
   - Methods of tree protection shall be indicated for all tree protection zones, including tree fencing, erosion control, retaining walls, tunneling for utilities, transplanting, staking, signage, etc.
   - This plan should indicate staging areas for parking, material storage, concrete washout, and debris burn and burial holes where these areas might affect tree protection.
   - The required site tree density factor must be satisfied. Compliance shall be demonstrated on the Tree Protection Plan. Existing trees or stands of trees used in the density calculation must be indicated on the drawing.
   - Flowering ornamental replacement trees may not be used in density calculation.
   - Replacement trees used in density calculations must be ecologically compatible with the intended growing site.
   - An irrigation plan may be required and it must include a watering schedule for existing and replacement trees on the site.
   - The following notes shall be indicated on both tree protection plans and grading plans in large letters:

1) CONTACT THE DEPARTMENT OF COMMUNITY DEVELOPMENT AT (678) 512-3200 TO ARRANGE A PRE-CONSTRUCTION CONFERENCE WITH THE CITY ARBORIST OR DESIGNATED AGENT(S) PRIOR TO ANY LAND DISTURBANCE.

2) ALL AND EROSION CONTROL MEASURES MUST BE INSTALLED PRIOR TO GRADING. ALL REQUIRED TREE PROTECTION FENCING (ALONG WITH TREE SAVE SIGNAGE) MUST BE INSTALLED PER THE APPROVED TREE PROTECTION PLAN PRIOR TO THE PRE-CONSTRUCTION MEETING.

3) UNDISTURBED BUFFERS SHALL BE REPLANTED TO BUFFER GUIDELINES WHERE SPARSELY VEGETATED OR WHERE DISTURBED AT APPROVED UTILITY CROSSINGS. REPLANTINGS ARE SUBJECT TO CITY ARBORIST OR DESIGNATED AGENT(S) APPROVAL.

Addendum to Appendix E., trees that have higher unit values

- Trees worth 1.0 unit each for density and/or recompense (4"caliper size)
  - Ceridiphyllum Japonicum----------Katsura Tree
  - Fagus Grandifolia----------American Beech
  - Magnolia Grandiflora----------Southern Magnolia
  - Nyssa Sylvatica----------Black Gum
  - Pistacia Chinensis----------Chinese Pistache
  - Quercus Nuttallii----------Nuttall Oak
  - Ulmus Americana----------American Elm

  (2" caliper sizes of these trees will count as .8 units for density and .5 for recompense)

- Trees worth .9 units each for density and/or recompense (4" caliper size)
  - Cladrastis Lutea----------American Yellowwood
  - Crytomeria Japonica----------Cryptomeria
  - Ginkgo Biloba----------Ginkgo
  - Juniperus Virginiana----------Eastern Red Cedar
  - Metasequoia Glytostroboides----------Dawn Redwood
  - Quercus Acutissima----------Sawtooth Oak
  - Quercus Lyrata----------Overcup Oak

  (2" caliper sizes of these trees will count as .7 units for density and .45 for recompense)

- Trees worth .8 units each for density and/or recompense (4" caliper size)
  - Carpinus Caroliniana----------American Hornbeam
  - Koelreuteria Paniculata----------Goldenraintree
  - Liriodendron Tulipifera----------Tulip Poplar
  - Quercus Prinus----------Chesnut Oak
  - Quercus Sumardii----------Shumard Oak
  - Taxodium Distichum----------Baldcypress
  - Ulmus Parvifolia----------Chinese Elm

  (2" caliper sizes of these trees will count as .6 units for density and .40 for recompense)

APPENDIX E. Tree Species Selection List

Trees generally acceptabe for credit in Density Calculations

	BOTANICAL NAME	COMMON NAME		BOTANICAL NAME	COMMON NAME
1	Acer Barbatum	Southern Sugar Maple	23	Juniperus Virginiana	Eastern Red Cedar
2	Acer Rubrum	Red Maple	24	Liquidambar Styraciflua	Sweet Gum
3	Acer Saccharum	Sugar Maple	25	liriodendron Tulipifera	Poplar
4	Betula Nigra	River Birch	26	Magnolia Grandiflora	Southern Magnolia
5	Carpinus Caroliniana	American Hornbeam	27	Metasequoia Glyptostroboides	Dawn Redwood
6	Carya Species	Hickories	28	Nyssa Sylvatica	Black Gum
7	Carya Illinoinesis	Pecan	29	Ostrya Virginiana	American Hophombean
8	Castanea Mollissma	Chinese Chesnut	30	Paulownia Tomentosa	Royal Paulownia
9	Catalpa Speciosa	Hardy Catalpa	31	Pinus Echinata	Shortleaf Pine
10	Cedrus Atlantica	Atlas Cedar	32	Pinus Taeda	Loblolly Pine
11	Cedrus Deodara	Deodar Cedar	33	Pistacia Chinensis	Chinese Pistache
12	Cedrus Libani	Cedar of Lebanon	34	Platanus Occidentalis	Sycamore
13	Celtis Laevigata	Sugar Hackberry	35	Quercus Species	Oaks, except Live Oaks
14	Cercidiphyllum Japonicum	Katsura Tree	36	Salix Babylonica	Weeping Willow
15	Cladrastis Lutea	American Yellowwood	37	Sophora Japonica	Japanese Pagodatree
16	Crytomeria Japonica	Cryptomeria	38	Taxodium Distichum	Common Baldcypress
17	Fagus Grandifolia	American Beech	39	Tilia Americana	Linden / Basswood
18	Fraxinus Americana	White Ash	40	Tsuga Canadensis	Canadian Hemlock
19	Fraxinus Pennsylvanica	Green Ash	41	Ulmus Americana	American Elm
20	Ginkgo Biloba	Ginkgo	42	Ulmus Parvifolia	Chinese Elm
21	Gymnocladus Dioicus	Kentucky Coffee Tree	43	Zelkova Serrata	Zelkova
22	Juglans Nigra	Black Walnut			

Other trees may be approved on a case by case basis. The general criteria for replacement trees to be used in Tree Density Calculations are large growing (35’ – 40’ tall or taller at maturity) and long-lived. All planting plans are subject to the City Arborist or the Department Community Development designated agent(s) approval.

APPENDIX F.Sample Tree Density Calculaiton

Example:
The required DFS (density factor for the site), is calculated as follows, 5 acres x 30 units = 150 units required.

EDF (Existing Density Factor

Size	Units	Number	Total Units
24”	9.3	2	18.6
18”	4.0	15	60
10”	2.4	8	19.2
		Total EDF	**97.8**

RDF (Replacement Density Factor)

Size	Units	Number	Total Units
3”	.60	15	9
6”	1.00	45	45
		Total RDF	**54**

EDF+RDF=	Site TotalTree Density	>	or	=	DFS	
97.8+54=	151.8	>			150	Density Satisfied

THE SUM OF THE <u>EDF</u> AND <u>RDF</u> MUST BE <u>GREATER</u> THAN OR <u>EQUAL</u> TO THE <u>DFS</u>.

APPENDIX G: MULTI-TRUNKED TREE CALCULATIONS TO DETERMINE SPECIMEN TREE STATUS

DIAMETER	RADIUS	AREA IN SQUARE INCHES	NOTES
1	.5	.79	
2	1	3.14	
3	1.5	7	
4	2	13	
5	2.5	20	
6	3	28	
7	3.5	38	
8	4	50	
9	4.5	64	
10	**5**	**79**	**79 square inches is the area for which a native flowering tree is considered a specimen.**
11	5.5	95	
12	6	113	
13	6.5	133	
14	7	154	
15	7.5	177	
16	8	201	
17	8.5	227	
18	9	254	
19	9.5	283	
20	10	314	
21	10.5	346	
22	11	380	
23	11.5	415	
24	**12**	**452**	**452 square inches is the area for which pines and beech trees are considered specimen size.**
25	12.5	491	
26	13	531	
27	**13.5**	**572**	**572 square inches is the area for which most hardwood trees are considered specimen size.**
28	14	615	
29	14.5	660	
30	15	707	
31	15.5	754	
32	16	804	
33	16.5	855	
34	17	907	
35	17.5	962	
36	18	1017	
37	18.5	1075	
38	19	1134	
39	19.5	1194	
40	20	1256	
41	20.5	1320	
42	21	1385	
43	21.5	1451	

PROCEDURE:

1. Measure trunks at 4.5 feet above grade to determine the diameter (DBH) in inches of each trunk.
2. Use charts to determine area in square inches.
3. Add square inches of each trunk and come up with a total.

4. Determine if total area is equal to or greater than the minimum specimen size for the type of tree identif

APPENDIX H. Tree and Site Related Disturbances

Tree protection zones, specimen trees or stands of trees designated to be saved must be protected from the following damages which may occur during all phases of land disturbance and construction processes. Methods of tree protection and disturbance prevention are provided in Section II, Part B.

- Direct physical root damage.
- Indirect root damage.
- Trunk and crown disturbances.

A. Direct physical root damage most frequently occurs during site clearing and grading operations, where transport or feeder roots are cut, torn or removed.

1. Transport and feeder roots tend to tangle and fuse among the roots of adjacent trees. The removal of trees with heavy machinery along the outer periphery of a tree save area can result in considerable damage within the tree save area.

2. The most substantial form of root damage for all root types occurs in the form of cut roots. Roots are cut in grade reduction or from trenching for underground utilities, sanitary sewer, or storm sewer lines.

3. A more subtle form of root damage is the loss of feeder roots. Feeder roots normally occur within the organic layer and the surface four inches of top soil, subsequently, these roots can be easily damaged by the track action from a single bulldozer pass. The stripping of top soil within a tree's root protection zone can totally eliminate it's feeder root system.

B. Indirect root damage through site modification can result from positive grade changes, temporary storage of fill material, sedimentation of erosion materials, soil compaction, and soil chemical changes.

- Positive grade changes from fill and sedimentation causes a decrease in soil oxygen levels. An increase in soil carbon dioxide and other toxic gases can also occur, leading to large areas of anaerobic soil conditions and causing a decrease in the root respiration process which is essential for the uptake and transport of minerals and nutrients.

- Anaerobic soil conditions are also produced by soil compaction, the increase in soil bulk density with a decrease in soil pore space. Compacted soil is also impervious to root penetration, and thus inhibits root development. Soil compaction is generally caused by the weight and vibrations of heavy machinery, vehicle parking, and the storage of fill and/or construction material within the root protection zone of trees.

- Changes in soil chemistry will adversely affect tree survival. The most frequent occurrence is the change (decrease) in soil acidity by concrete washout. Most trees native to the City of Johns Creek area prefer slightly acid soils; concrete residues are highly basic. The leakage or spillage of toxic material such as fuels or paints can be fatal for trees.

C. Trunk and crown disturbance are generally mechanical in nature and are either caused directly by clearing and grading machinery, or indirectly by debris being cleared and falling into trees marked for protection.

- Common forms of damage include stripped bark and cambium, split trunks, and broken limbs.

- Damage also occurs from the posting of signs such as building permits or survey markers on trees.

- Indirect damage can be caused by the placement of burn holes or debris fires too close to trees. The possible range of damage include scorched trunks with some cambial dieback, the loss of foliage due to evaporative heat stress (leaf desiccation), and completely burned trunk and crowns.

APPENDIX I. Residential Erosion & Sedimentation Control and Tree Protection Agreement
Building Permit No.

THIS PERMIT AUTHORIZES _____
TO BEGIN RESIDENTIAL GRADING/LAND DISTURBANCE ON LOT _____
IN _____ SUBDIVISION OR AT THE
FOLLOWING ADDRESS _____ .

THE AUTHORIZED PERSON ACKNOWLEDGES THAT HE/SHE IS RESPONSIBLE FOR TAKING ADEQUATE STEPS TO:

EROSION CONTROL

1. Control soil erosion on said property.
2. Control the movement of sediment off the site by means of properly constructed and maintained silt straps, (silt fence, haybales, ets.) in those areas where water exits the property.
3. Keep mud off the streets fronting this property by construction and maintenance of a driveway pad and removal of mud from the street when necessary.
4. Otherwise comply with all applicable erosion and sedimentation requirements, including those of the City of Johns Creek Soil Erosion and Sedimentation Control Ordinance.

These provisions and others are outlined in the City of Johns Creek Soil Erosion and Sedimentation Ordinance, 2007. (Please initial the appropriate statement below.)

_____ I, THE UNDERSIGNED AUTHORIZED PERSON, have obtained a copy of this Ordinance at this time and understand the provision of the Law.

_____ I, THE UNDERSIGNED AUTHORIZED PERSON, decline a copy of the Ordinance at this time. However, I do hereby attest that I do understand the provisions of the Law.

TREE PROTECTION

1. Protect areas of existing trees/tree save areas on this lot, so that a minimum of 20 tree units per acre is left after construction is completed. If a specimen or heritage tree* exists on the lot and is in the way of proposed construction please contact the City of Johns Creek Arborist at 678-512-3290 to schedule an on-site meeting to try and find alternate areas for the disturbance.
2. Tree fence with tree save signage is required on a lot when clearing and grading for home construction commences. All tree fences shall remain and be maintained until the home construction is 100% completed.
3. Otherwise comply with all applicable Tree Preservation requirements, including those of the Tree Preservation Ordinance and Administrative Guidelines.

*Specimen or Heritage Trees – Any tree in fair or better condition which equals or exceeds the following diameter sizes:

A. Large hardwoods like Oaks, Maples, Yellow Poplars, and Hickories. 27 inch diameter at 4½ feet above the ground.

B. Large hardwoods, Beeches, 24 inch diameter at 4½ feet above the ground.

C. Large softwoods like Pines and Cedars. 24 inch diameter at 4½ feet above the ground.

D. Small flowering trees like Dogwoods, Redbuds, and Sourwoods, 10 inch diameter at 4½ feet above the ground.

FAILURE TO COMPLY WITH THESE REQUIREMENTS WILL RESULT IN THE ISSUNACE OF A STOP WORK ORDER OR OTHER CITATIONS.

EFFEFCTIVE THIS _____ DAY OF _____ , 20 _____.
APPLICANT_____ CITY OFFICIAL _____

DISPLAY THIS PERMIT AT THE MAIN POINT OF ACCESS AND VISIBLE FROM THE STREET.

APPENDIX J. Acceptable Evergreen Plant Material for Undisturbed Buffers

Cherry Laurel
Ligustrum
Hedge Bamboo
Eastern Red Cedar
Cleyera
Canadian Hemlock
Cryptomeria
Deodar Cedar
American Holly
Chinese Holly
English Holly
Longstalk Holly
Lusterleaf Holly
Perny Holly
Nellie R. Stevens Holly, (cross between Chinese & English Hollies)
Tree-form Yaupon Holly
Hetzi Juniper
Pfitzer Juniper
Southern Magnolia
Wax Myrtle
Virginia Pine
Japanese Viburnum
Japanese Camellia

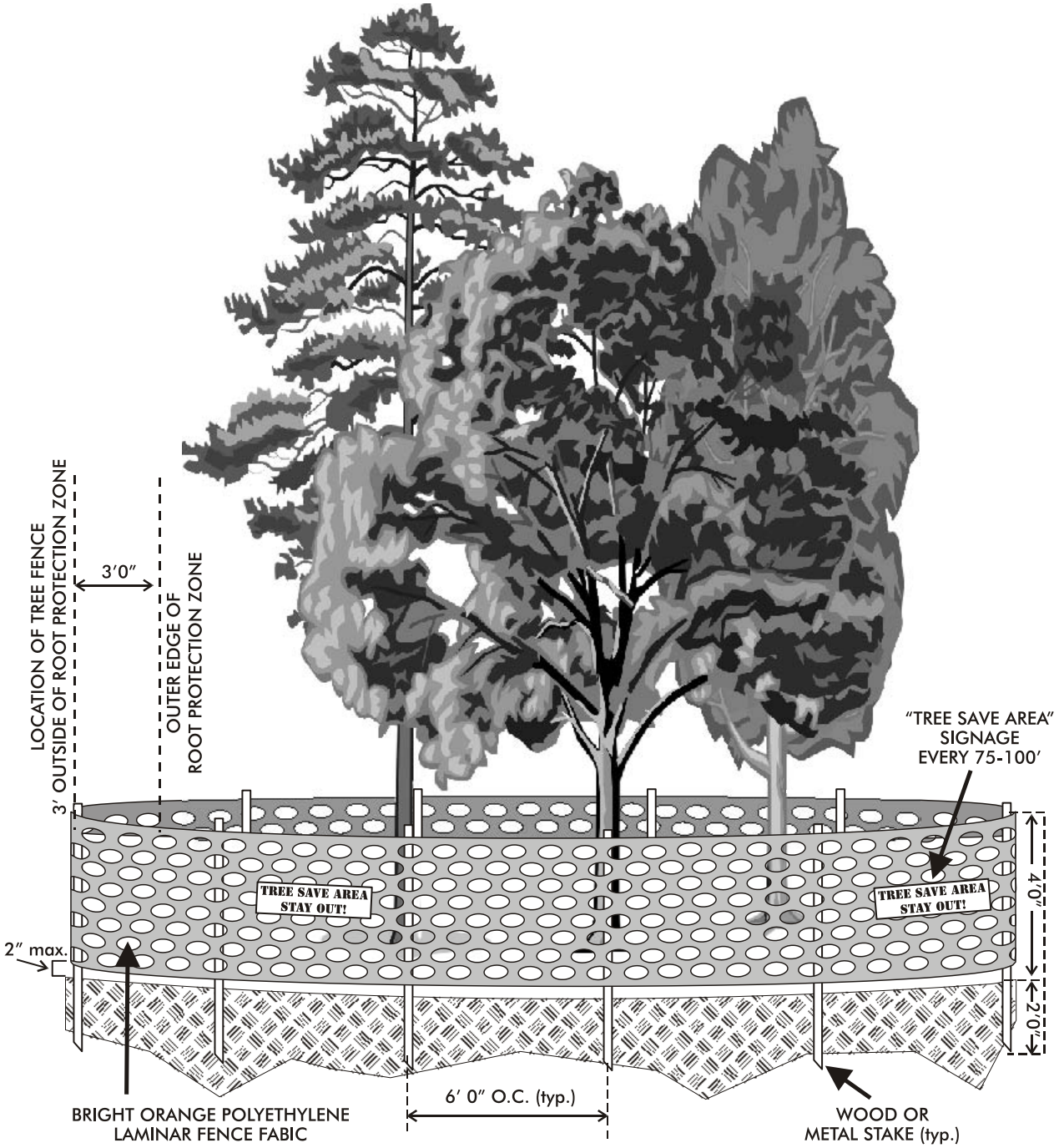
Note: All buffer material must be a minimum of 5 feet tall once it is installed and have branching all the way to the ground.

APPENDIX K. Recommended Shade Trees for Parking Lots

Acer rubrum	Red Maple
Acer saccharum "Legacy"	"Legacy" Sugar Maple
Betula nigra	River Birch
Celtis laevigata	Sugar Hackberry
Cercidiphyllum japonicum	Katsuratree
Fraxinus pennsylvanica	Green Ash
Gingko biloba	Gingko
Ostrya viginiana	Hophombean
Pinus taeda	Loblolly Pine
Pistacia chinensis	Chinese Pistache
Platanus occidentalis	Sycamore
Quercus acutissima	Sawtooth Oak
Quercus coccinea	Scarlet Oak
Quercus laurifolia	Laurel Oak
Quercus lyrata	Overcup Oak
Quercus palustris	Pin Oak
Quercus phellos	Willow Oak
Quercus prinus	Chesnut Oak
Quercus rubra	Northern Red Oak
Quercus shumardii	Shumard Oak
Quercus stellata	Post Oak
Quercus velutina	Black Oak
Taxodium distichum	Bald Cypress
Ulmus parvifolia	Chinese Elm
Zelkova serrata	Japanese Zelkova

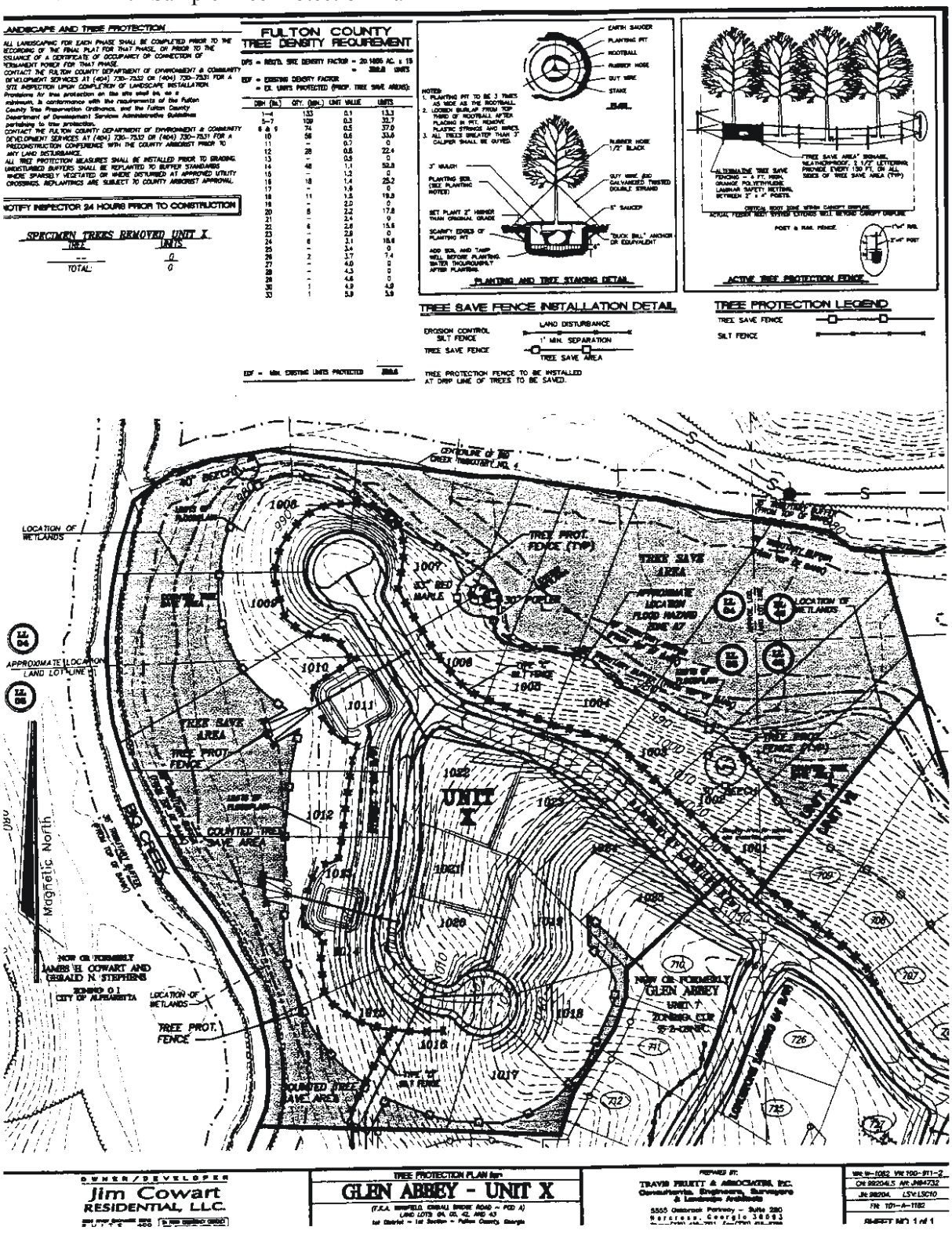
This is a recommended list only. Other species may be acceptable as long as they produce dense, full canopies at maturity and can develop sufficient root systems in confined spaces. Under no circumstances will upright, columnar or fastigiate trees be acceptable as parking lot shade trees.

APPENDIX L. Protective Tree Fencing



"Tree Save" signs may be purchased at the cashiers booth in Suite 2085 of the Environment & Community Development Department in the Fulton County Government Center.

APPENDIX M. Sample Tree Protection Plan



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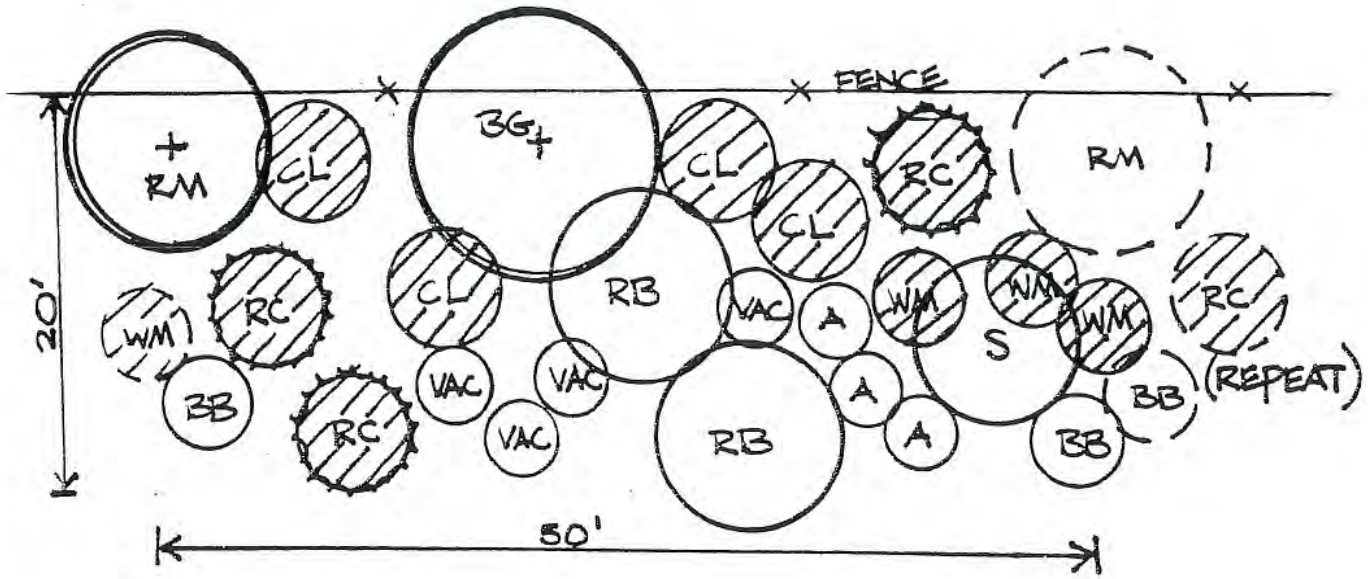
LANDSCAPE DETAIL D-1
DETENTION POND LANDSCAPE BUFFER PLANTING



PLANTS PER 50 LINEAR FEET

OVERSTORY TREES

1 BG– BLACK TUPELO/BLACK GUM	NYSSA SYLVATICA
1 RM – RED MAPLE	ACER RUBRUM

EVERGREEN TREES

4 CL – CHERRY LAUREL	PRUNUS CAROLINIANA
3 RC – VIRGINIA RED CEDAR	JUNIPERUS VIRGINIANA

FLOWERING TREES

2 RB – REDBUD	CERCIS CANADENSIS
1 S – SERVICE BERRY	AMELANCHIER ARBOREA

EVERGREEN SHRUBS

3 WM – WAX MYRTLE	MYRICA CERIFERA

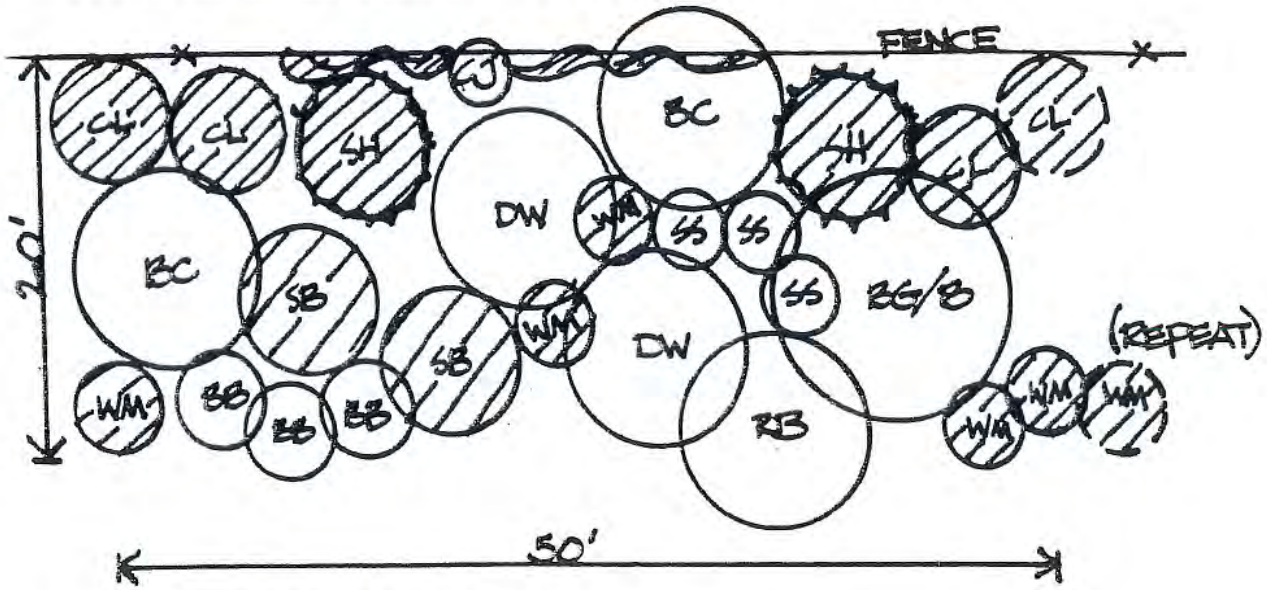
DECIDUOUS SHRUBS

3 A – NATIVE AZALEA (ARBORESCENS, CANESCENS, ETC.)	RHODODENDRON SP.
3 BB – AMERICAN BEAUTYBERRY	CALLICARPA AMERICANA
4 VAC – RABBITEYE BLUEBERRY	VACCINIUM ASHEII

VINES ON FENCE – CAROLINA JESSAMINE, WINTER CREEPER, TRUMPET HONEYSUCKLE, CROSSVINE, SMILAX

TREES : MINIMUM 2" CAL./6' HT. SHRUBS : MINIMUM 3 GAL. FULL

LANDSCAPE DETAIL D-2
DETENTION POND LANDSCAPE BUFFER PLANTING



PLANTS PER 50 LINEAR FEET

OVERSTORY TREES

2 BC – BALD CYPRESS	TAXODIUM DISTICHUM
1 BG – BLACK TUPELO/BLACK GUM	NYSSA SYLVATICA
/ B – OR RIVER BIRCH	BETULA NIGRA

EVERGREEN TREES

3 CL – CHERRY LAUREL	PRUNUS CAROLINIANA
2 SB – SWEETBAY MAGNOLIA	MAGNOLIA VIRGINIANA
2 SH – SAVANNAH HOLLY	ILEX x SAVANNAH

FLOWERING TREES

1 RB – REDBUD	CERCIS CANADENSIS
2 DW – DOGWOOD	CORNUS FLORIDA

EVERGREEN SHRUBS

5 WM – WAX MYRTLE	MYRICA CERIFERA

DECIDUOUS SHRUBS

3 BB – AMERICAN BEAUTYBERRY	CALLICARPA AMERICANA
3 SS – SWEETSHRUB	CALYCANTHUS FLORIDUS

VINE ON FENCE

1 CJ – CAROLINA JESSAMINE	GELSEMIUM SEMPERVIRONS

TREES : MINIMUM 2" CAL./6' HT. SHRUBS : MINIMUM 3 GAL. FULL