A. General Requirements.

1. Intent. The standards outlined in this Section aim to:
   a. Preserve and protect the City's natural character while allowing development to occur.
   b. To protect and manage the City's natural areas through the restoration of pre-settlement hydrology and sustainable land management, which will maximize ecosystem health and biodiversity.
   c. Visibly incorporate these natural areas into new developments.
   d. Prioritize Streamside Buffers and Very High and High Priority Areas, while still maintaining open space requirements of this ordinance.
   e. Provide continuity between all conservation areas and open spaces, to allow migration of plants and Animals.
   f. Preserve some level of Medium Priority areas.

2. Applicability. The following standards apply to all Properties included within an application for a land development process outlined in I.4.
   a. When multiple Parcels are being utilized to create a new Plat, the standards shall be applied to the Property as a whole and not to individual Parcels.

3. Streamside Buffers. Required Streamside Buffers per the City's Streamside Management Buffer Ordinance are calculated separately and do not count toward any conservation area requirement.

4. Conservation Types. The following three levels of conservation are defined, each with specific requirements, in this section and referred to as "Conservation Types" or "Conservation Areas."
   a. Conservation Area A.
   b. Conservation Area B.
   c. Conservation Area C.

5. Required Amount of Conserved Area. For each Priority Area, percentages required to be set aside for Conservation Areas are defined within the Specific Requirements for each Priority Area and Conservation Area Type (See Table 2.A-1), with the following exception:
   a. Refer to II.1.D for exceptions to Properties with more than 50% of the Property required to be Conservation Area and/or Open Space.

6. Dedication of Conservation Areas to the City. The Applicant may Dedicate any or all of their Conservation Area to the City with the following requirements.
   a. The Dedication must be reviewed by the Natural Resources Board and approved by the MPC and must meet the following:
      (1) The total area must be a minimum of twenty (20) acres and must be contiguous, with the exception of permitted street crossings.
      (2) The area must include any Conservation Area A on the Parcel.
   b. The Applicant must pay a fee in lieu of restoration and management to be determined by the City. The fee shall include development of the Restoration and Management Plan and funding for implementation of the restoration and management plan for ten (10) years.

B. Qualifying Features Delineation.

The following process shall be utilized by the Applicant to determine the location of Priority Areas and Conservation Areas on a Parcel.

1. Conservation Priority Map. The Conservation Priority Map, available at City Hall, determines approximate locations of Priority Areas (Very High, High, and Medium Priority) on each Parcel. These locations are defined for Owner information purposes only and must be verified through a Qualifying Features Delineation prior to application for Preliminary Plat (see I.4.C).

2. Qualifying Features Delineation (QFD). A survey and assessment is required to delineate areas of qualifying features and determine the accurate boundaries of Priority Areas on the Parcel.

3. Qualified Professional. Unless otherwise noted, the QFD must be conducted by a forester, arborist, botanist, or other similarly qualified professional approved by the City and maintained on the City's List of Professionals Qualified to Conduct the QFD, available at City Hall. Approval includes, at a minimum, certification from a national organization or four (4) year degree in **botany, natural resources, or a related field**, and a minimum of ten (10) years professional experience in the related field.

4. Release Letter. For any portion of the QFD process, the Applicant may submit a letter to the City from the qualified professional stating that no qualifying features exist on the Property or a specified portion of the Property. Based on this letter, the City may release the Applicant from performing that step of the QFD on the applicable portions of the Property.

5. Qualifying Features Delineation Process. The following process shall be used to qualify Priority Areas on the Property.
   a. Forest Stand Groups. Delineate the boundaries of Forest Stand Groups, as defined by the City's Natural Resource Assessment, utilizing the required tree survey (refer to III.4.B(3)).
   b. Vegetation Survey. The following process shall determine the relative frequency of Heritage Plants within the Property.
      (1) Document the following Vegetation Survey on a boundary and topographic survey of the Property, at a Scale no greater than 1"=100'-0".
      (2) Initial Priority Area Delineation. Delineate the boundaries of initial Priority Areas (Very High, High, Medium) on the survey of the Property utilizing the City's Natural Resource Inventory and Assessment and the Conservation Priority Map as well as review of recent aerial photography, site topography, soil surveys, National Wetland Inventory maps, and Natural Resource Conservation Service farmed wetland maps.
      (3) On Site Survey. Utilizing the initial Priority Area boundaries, perform an on site survey during the growing season (April to October) to qualify the Priority Areas.
         (a) Sampling Intensity. A twenty five (25) foot by twenty five (25) foot grid shall be established across the Property and recorded on the survey. Areas previously developed or Used agriculturely at any time during the period of 1978 to present may be removed from the process.
         (b) Sampling. One vegetation sampling shall be conducted within each grid cell using a minimum of one quarter (1/4) square meter quadrat.
         (c) Photograph and record a complete list of all species present in each quadrat.
      (4) Heritage Species. For each sample, determine the proportion of native species versus weedy, non-native or aggressive species utilizing the City of Lakeland's Heritage Plant List, available at City Hall.
      (5) Qualify Each Area. The qualification of each grid cell as Very High, High, or Medium Priority is based on the number of heritage species present. Refer to Qualifying Features of each Conservation Area, III.F.2, III.G.2, III.H.2. All grid cells that do not meet any qualifications are considered Low Priority and do not constitute a Conservation Area designation.
      (6) Submittals. The following items shall be submitted to the City as part of the Qualifying Features Survey. Refer to I.4.C(4)(c).
         (a) Location of each Priority Area and each sampling shall be surveyed and overlayed on the initial boundary.
         (b) General Plant Inventory. A general plant inventory shall be submitted for each sampling.
      (7) City Verification. Provide sufficient field delineation (flagging or other markings) of all Very High and High Priority Areas for on-site review by the City.
         (a) The City may request additional samplings to validate the size and shape of any designated area.
   c. Slope Measurements. Percentage of slope shall be measured across the Property in increments no less than ten (10) percent.
   d. Soils. Delineate the location of Soil Types, identified by the City's Natural Resource Assessment.
   e. Open Water. Delineate the boundaries of all open water bodies.
   f. Wetlands. As needed, perform a Field Survey of wetland locations per the current US Army Corps of Engineer's wetlands manual.
   g. Archaeological Features. A qualified archaeologist shall perform an archaeological survey of the Parcel to determine locations of significant archaeological features, such as Native American sites or cemeteries.

6. Parcel Priority Map. Refer to the Specific Requirements of each Priority Area for the Qualifying Features and map the Very High, High, and Medium Priority Areas on the Property.

7. Conservation Area Map. Develop a map of Conservation Areas on the Property per the requirements of this Section for submittal to the City.

C. Restoration and Management Plan.

1. Restoration and Management Plan Establishment. The Applicant shall establish a ten (10) year restoration and perpetual management plan for all Conservation Areas established by this Section to be kept on file at City Hall.

2. Purpose. The purpose of the plan is to establish the processes and responsible parties to assure the initial

restoration and ongoing health and vitality of the Conservation Areas.

3. Plan Implementation. Implementation of the Restoration and Management Plan is the responsibility of the Applicant for a minimum period of five (5) years, unless a transfer of the Applicant's obligations is approved by the BOC.
   a. Implementation of the Plan after five (5) years shall be provided in the Covenants and Restrictions for the development (refer to V Appendix for details).

4. Restoration and Management Plan Requirements. The plan shall, at a minimum, include the following items:
   a. Statement of Purpose. A narrative description of the goals of the restoration and management of the property.
   b. Description and Location of the Conservation Areas.
   c. Qualifying Features Delineation Survey. The plan shall include the survey(s) developed to determine the Conservation Areas (refer to III.2.B).
   d. Management Goals and Objectives. At a minimum, the following shall be included.
      (1) A description of the general goals and objectives for establishing, restoring, and maintaining the natural landscape of each Conservation Area, per the requirements of this Section.
      (2) Rare Species. Specific objectives for protection of any rare species or species of concern.
      (3) Exotic Species. Requirement for removal or retention of exotic species that may occur on the site.
      (4) Harvesting. Requirements for harvesting, if any, that may occur on the site.
      (5) Diversity. Specific goals for desired plant and/or animal diversity.
   e. Action Plan. At a minimum, the Action Plan shall include:
      (1) Timeline. A timeline for a minimum ten (10) year restoration process and definition of any change in responsible party throughout that time period.
      (2) Responsible Party. Each action item shall include the responsible party.
      (3) Management Practices. Specific management practices shall be defined to meet the goals and objectives. Actions shall include, at a minimum:
         (a) Maintenance practices, including but not limited to, mowing heights and mowing frequencies.
         (b) Methods for control of exotic species.
         (c) Processes for cutting or removal of weedy or prolific unwanted species.
         (d) Process for insect and disease control.
         (e) Regulation of use of herbicides and pesticides.
         (f) Method of replanting, including species, timing, and process.
         (g) Method of prescribed burning.
         (h) Requirements for erosion control.
   f. Monitoring Plan. Description of an annual monitoring process to measure the effectiveness of management techniques and the health of natural communities and natural processes. At a minimum, the monitoring plan shall include:
      (1) Specific monitoring methods and protocols.
      (2) How the monitoring results will affect changes in the action plan, if the management practices defined in the action plan do meet the specified objectives.
   g. Monitoring Report. The plan shall require submittal of a monitoring report to the City, submitted on a biannual basis. The report shall include:
      (1) Discussion of management practices completed during the prior growing season.
      (2) Annual monitoring results, including the results from any previous years.
      (3) Recommended revisions to the Restoration and Management Plan.
   h. Annual Inspection. Annually, a Qualified Professional (see III.2.B(3)), shall visit the site to determine the status of the restoration and recommend any necessary modifications to the Restoration and Management Plan to achieve the goals and objectives.
   i. Funding Plan. The process for funding the Management Plan shall be provided for the next five (5) years, and shall be updated annually for terms of five (5) years. Funds for five years of restoration and/or maintenance shall be continuously available to the City should the responsible party fail to implement the Restoration and Management Plan.

5. Plan Approval and Revisions. The Restoration and Management Plan shall be submitted and approved with application processes as defined in I.4.
   a. Subdivision. The Restoration and Management Plan shall be reviewed by the NRB and approved by the MPC during the Preliminary Plat process.
   b. Site Plan. For Site Plan only submittals, the Restoration and Management Plan shall be reviewed by the NRB and approved with the Site Plan by MPC.

b. File. The Restoration and Management Plan shall be kept on file at City Hall, updated as approved.
c. Modifications. Any modifications to the Restoration and Management Plan shall be submitted to the City for review and approval. The Code Administrator shall provide written comments and status within sixty (60) days of submittal.
d. Emergencies. Modifications to the plan, implemented due to an emergency situation, such as fire, insect infestation, or disease, must be submitted to the City within thirty (30) days of implementation, to begin the review process discussed in III.2.C(4)(a).

D. Plat Requirements.

All required Conservation Areas must be included on the Final Plat (refer to I.4.E) and zoned as OS5 District: Conservation Open Space.

E. General Design Requirements.

The following requirements apply to all Conservation Areas. Refer to Figure 2.E-1 and 2.E-2 for an illustration of these concepts.

1. Intent. General design requirements provide the standards to achieve the following:
   a. Establish a high quality, diverse system of natural areas, with a maximum amount of continuity to permit the migration of wildlife and flora.
   b. Maintain the natural character of the City and ensure high visibility of the natural areas.
   c. Allow pedestrians, bicyclists, and equestrians access to a comprehensive, continuous system of open space and natural areas.
   d. Encourage interconnected communities through required street connections.

2. Continuity. The following standards establish continuity between Conservation Areas.
   a. Continuity of Conservation Areas on Property. Conservation Areas within a quarter (1/4) mile of other Conservation Areas on the Property must be contiguous via a minimum three hundred (300) foot wide area, which shall be maintained as Conservation Area C.
      (1) Scenic Corridor Easements. Scenic Corridor Street Type Easements (refer to II.8.P) that provide this same connection may fulfill this requirement.
      (2) Stream Buffers. Streamside Buffers, required per the Streamside Management Buffer ordinance, that provide this same connection may fulfill this requirement.
      (3) Street crossings utilizing the Conservation Overlay do not interrupt contiguousness.
   b. Continuity of Conservation Areas on Adjacent Property. Conservation Areas within a quarter (1/4) mile of Conservation Areas located on another Parcel adjacent to the Applicant's Parcel must be connected via a minimum fifty (50) foot wide, preferred one hundred (100) foot wide, area which shall be maintained as Conservation Area C where Very High and High Priority Areas do not exist. Applicants must provide this connection up to their Property Lines.
   c. Exception. Refer to II.1.D for relief from these provisions based on the size of the Property and the amount of Conservation Area and Open Space required.

Priority Areas Existing on Site			Required Percentages of Priority Areas to Include in Protection/ Conservation Areas		
Very High (A)	High (B)	Medium	Protection Area A	Conservation Area B	Conservation Area C
✓			100%		
	✓			50%	
		✓			40%
✓	✓	✓	100%	30%*	0%
✓	✓		100%	30%*	
✓		✓	100%		25%*
	✓	✓		50%	25%*

*0% for sites less than 10 acres

Table 2.A-1. Table of Required Conservation Areas as Percentages of Priority Areas.

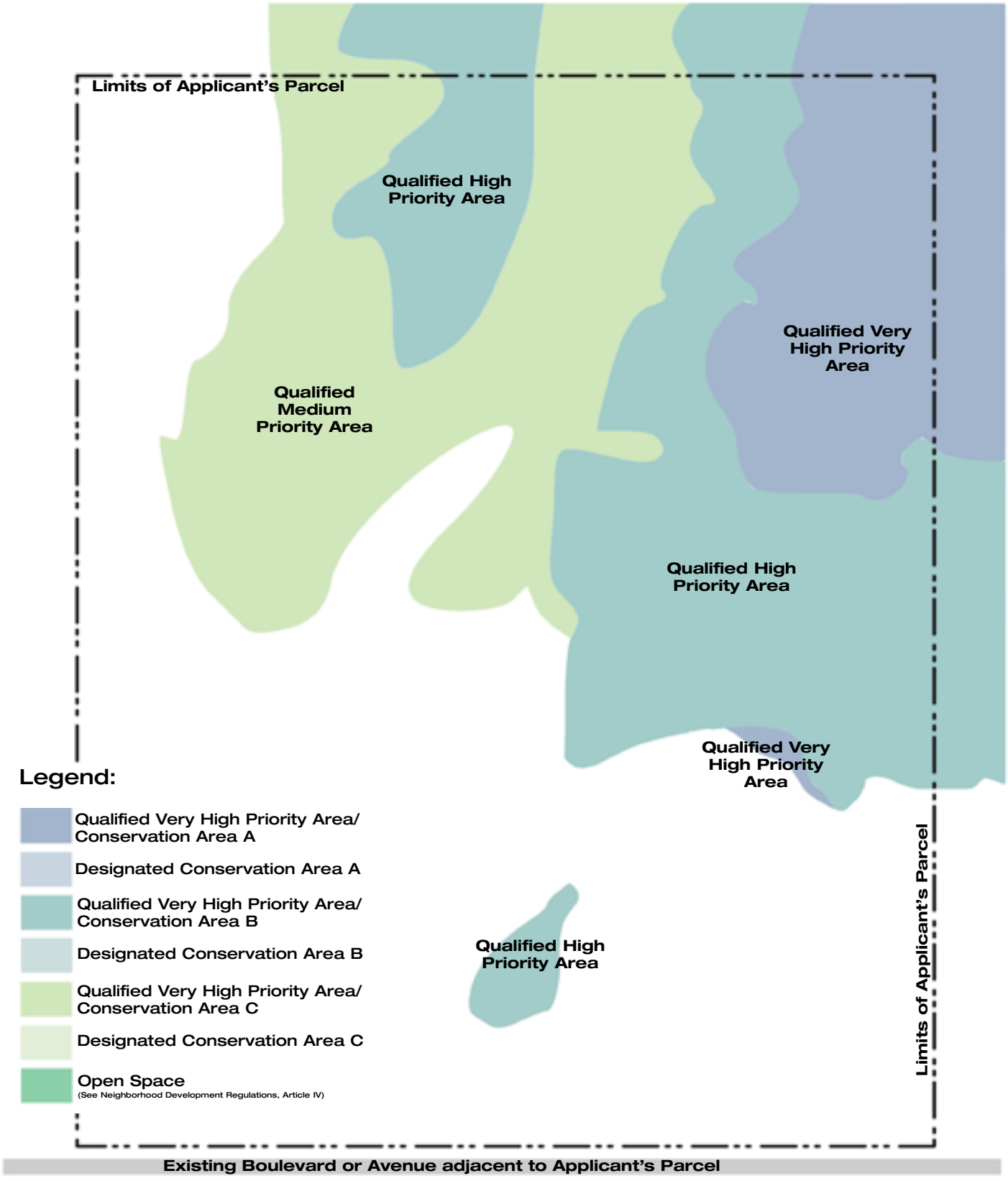

Figure 2.E-1. Priority Areas Delineated on a Parcel.

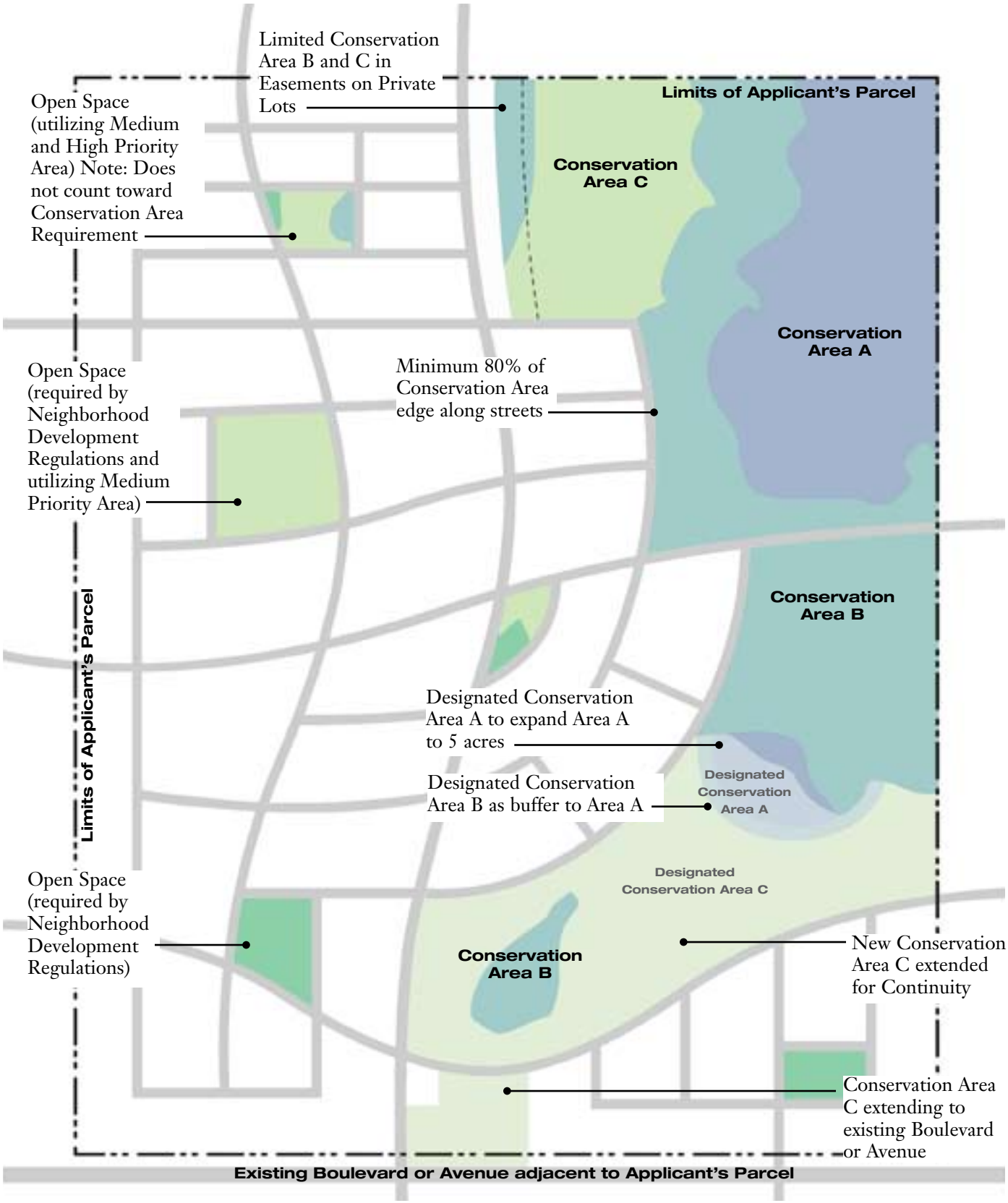

Figure 2.E-2. Illustration of Neighborhood design on Parcel, designating Conservation Areas.

3. Pedestrian, Bicycle, and Equestrian Access.
   a. Pedestrian Crossings. Pedestrian crossings through Conservation Areas B and C shall occur at a minimum of every quarter (1/4) mile, in conjunction with street crossings where possible.
   b. Pedestrian, Bike, & Equestrian Trails. Refer to the City's Comprehensive Plan, available at City Hall, for the locations of pedestrian/bicycle and equestrian trails.
      (1) These trails are permitted through Conservation Areas B and C.
      (2) Trails for the purpose of continuity may be permitted through Conservation Area A with the approval of the Code Administrator.

4. Street Connections. The following standards establish street connections through the Conservation Areas.
   a. Existing Streets. Where possible, street connections through Conservation Areas shall connect to existing streets.
   b. Conservation Areas B and C. Street connections through Conservation Areas B and C shall occur a minimum of once every half (1/2) mile with the following exceptions:
      (1) At the Parcel boundaries, when the adjacent Parcel is within another municipality and no connection exists.
      (2) At Waterways as defined, unless a street crossing is shown on the Property on the City's Comprehensive Plan.
      (3) At locations with slopes steeper than fifteen (15 percent over one (1) continuous acre.
      (4) At highways or railroads with limited access and no opportunity to connect to the other side.
   c. Conservation Area A. Streets shall not cross Conservation Area A with the following exception:
      (1)When Area A is greater than fourteen (14) acres, streets shall cross at a minimum of once every half (1/2) mile.
   d. In locations where the Conservation Area blocks the minimum number of Access Points for a Neighborhood Type (refer to II.1.E(4)) and no other location is available, the Code Administrator may approve a reduction in the interval of street crossings to meet the Neighborhood Type requirement.
   e. Types. Any Street Type may cross a conservation area; however, the Conservation Street Overlay shall be utilized (refer to II.8.Q).

5. Street frontage. The following standards require Conservation Areas to front on streets.
   a. A minimum eighty (80) percent of the linear edge of all combined conservation areas shall abut street Right-of-Way with the following exceptions.
      (1) Those edges of all combined conservation areas that abut other open space.
      (2) Those edges that abut other developments under separate ownership.
   b. To increase visibility of Conservation Areas, if any Conservation Area is within four hundred (400) feet of an existing Boulevard or Avenue and no other open space Easement exists adjacent to that Boulevard or Avenue, the Conservation Area shall be extended to the edge of the Right-of-Way of that Boulevard or Avenue.

6. Fencing. Conservation Areas may be fenced, provided that the following requirements are met.
   a. Height. Fencing shall be a maximum height of forty-two (42) inches.
   b. Level of Opacity. Fence opacity must be no greater than sixty (60) percent.
   c. Gates or Openings. Gates or openings shall be provided on every street face at a minimum of every two hundred (200) feet.

7. Open Water. A twenty (20) foot buffer of Conservation Area must be provided adjacent to all Open Water.

F. Specific Requirements for Very High Priority Areas and Conservation Area A.

1. Intent. Very High Priority Areas shall be established as Conservation Area A to preserve and restore the city's prime natural areas, including valuable forest stands, wetlands, open water bodies, steep slopes, floodway, and Floodplain.

2. Qualifying Features. Very High Priority Areas are areas greater than two (2) acres that meet any one of the following criteria:
   a. Greater than forty (40) percent Lakeland Heritage Plants, as determined by the Vegetation Survey, refer to III.2.B(5).
   b. All wetlands.
   c. All open water bodies.
   d. Archaeologically historic sites, as determined by the required archaeological survey, refer to III.2.B(5)(g).

3. Amount of Area to be Conserved. One hundred (100) percent of the Very High Priority must be preserved in its entirety (see Table 2.A-1) with the following exception.

a. For Subdivisions ten (10) acres or smaller, no more than fifty (50) percent of the Subdivision is required to be conserved.

4. Specific Design Requirements. The following specific design standards are required for all Conservation Area A locations.
   a. Minimum Size of Conservation Area. Conservation Area A must consist of at least five (5) acres of contiguous area.
      (1) If the qualifying area consists of less than five (5) contiguous acres, the area must be expanded to fulfill this requirement.
      (2) For Subdivisions ten (10) acres or smaller, fifty (50) percent of the Subdivision, including the Very High Priority Area, must be preserved as Conservation Area A.
   b. Minimum Width of Conservation Area. The minimum width of the area in any location must be at least one hundred (100) feet.
   c. Required Buffers. Fifty (50) foot buffers shall be established between the area and any adjacent Zoning District other than Open Space Districts.
      (1) Buffer Designation. These buffers must meet all the requirements of Conservation Area B areas, and will count towards the requirement quotas of that Area (see III.2.G).
   d. Street Connections and Crossings. There shall be no street connections or crossings through Conservation Area A, except as permitted in Section III.2.E(4)(b).
   e. Impervious Coverage. No increase in impervious surfaces is permitted.
   f. Uses and Structures. No Use other than Conservation (refer to IV.2.J(5)) is permitted.
      (1) No structures are permitted in Conservation Area A.
      (2) Sports fields and playgrounds are not permitted.

5. Restoration and Management Requirement. Restoration and Management of Conservation Area A shall be defined in the Restoration and Management Plan (refer to III.2.C) with the following minimum requirements.
   a. Avoid or minimize soil damage, compaction, or other impacts to soil health.
   b. Establish a stable vegetative condition for the entirety of the Parcel. Remove invasive or noxious trees, shrubs, and herbaceous plants.
   c. In wooded areas, thin all trees to allow a light level on the ground plane that can sustain suitable grasses and flowering perennials, approximately thirty (30) to eighty (80) shade trees per acre.
   d. Seed or plant bare (prepared) soil with suitable prairie, woodland, or meadow grasses.
      (1) Provide adequate water, weed control, and other measures to allow healthy establishment of the vegetation.
      (2) For warm season grasses, maintain with annual controlled prescription burning, or seasonal mowing, when burning is not feasible.
      (3) For cool season grasses or meadows, maintain with seasonal mowing.
   e. Improve and enhance biodiversity to the degree possible.
   f. Restoration is required for one hundred (100) percent of the area of Conservation Area A.

6. Dedication. Conservation Area A may be dedicated in whole to the City or another organization approved by the City that will restore and manage the Conservation Area, refer to III.2.A(6).

G. Specific Requirements for High Priority Areas and Conservation Area B.

1. Intent. Conservation Area B is established to set aside appropriate portions of High Priority Areas, to maintain natural area through management, and to foster continuity between the natural areas.

2. Qualifying Features. High Priority Areas include areas greater than two (2) acres with twenty (20) to thirty-nine (39) percent Lakeland Heritage Plants, as determined by the Vegetation Survey, refer to III.2.B(5).

3. Amount of Area to be Conserved. Reference Table 2.A-1 for percentages of High Priority Areas to be designated as Conservation Area B with the following exception.
   a. For Parcels less than ten (10) acres and containing any amount of Conservation Area A, no conservation area is required for the High Priority Areas.

4. Specific Design Requirements. The following specific design standards are required for all Conservation Area B locations.
   a. Minimum Size of Conservation Area. Conservation Area B must consist of at least two (2) acres of contiguous area. If the qualifying area consists of less than two (2) contiguous acres, the area must be expanded to fulfill this requirement and all shall serve as Conservation Area B.
   b. Contiguous. Streets crossing the Conservation Area developed with the Conservation Street

Overlay do not interrupt the contiguousness of the area, but the street Right-of-Way may not be included in the area quantity.

c. Minimum Width of Conservation Area. The minimum width of the area in any location must be at least fifty (50) feet.

d. Relationship with Other Conservation Areas. The area shall be contiguous with other Conservation Area A, Conservation Area B, and Conservation Area C areas, both on the Parcel and adjacent Parcels. Refer to III.2.E(2).

e. Impervious Coverage. A maximum of 5% of the Property's Conservation Area B may be covered in Impervious surfaces. An additional area of 5% may be Semi-Pervious.

f. Uses and Structures. All Uses, Accessory Uses, and Accessory Structures permitted in the OS5 district are permitted in Conservation Area B. Refer to IV.2.

(1) Sports fields and playgrounds are not permitted.

(2) A Library/Museum (refer to IV.2.D.5) is permitted with following development standards.

(a) The Conservation Area B Lot must be a minimum of five (5) acres.

(b) The content of the facility must be oriented to the natural environment.

(c) The Civic Building Type (refer to IV.3.M) must be used for the Library/Museum.

(3) Accessory Structures are permitted only on Lots five (5) acres or larger.

5. Management Requirement. Management of Conservation Area B shall be defined in the Restoration and Management Plan with the following minimum requirements.

a. Soil Health. Avoid or minimize soil damage, compaction, or other impacts to soil health.

b. Establish a stable vegetative condition for the entirety of the Parcel. Remove invasive or noxious trees, shrubs, and herbaceous plants.

c. In wooded areas, thin all trees to allow a light level on the ground plane that can sustain suitable grasses and flowering perennials, approximately thirty (30) to eighty (80) shade trees per acre.

d. Seed or plant bare (prepared) soil with suitable prairie, woodland, or meadow grasses.

(1) Provide adequate water, weed control, and other measures to allow healthy establishment of the vegetation.

(2) For warm season grasses, maintain with annual controlled prescription burning, or seasonal mowing, when burning is not feasible..

(3) For cool season grasses or meadows, maintain with seasonal mowing.

e. Improve and enhance biodiversity to the degree possible.

H. Specific Requirements for Medium Priority Areas and Conservation Area C.

1. Intent. Conservation Area C is established to set aside appropriate portions of Medium Priority Areas, to maintain natural areas through management, to foster continuity between the natural areas, and to preserve the existing rural character of the City.

2. Qualifying Features. Medium Priority Areas include all areas greater than one (1) acre, not included in Very High or High Priority, that have not been previously developed or used agriculturally since 1978.

3. Amount of Area to be Conserved. Reference Table 2.A-1 for percentages of Medium Priority Areas to be designated as Conservation Area C with the following exceptions.

a. If the total of Conservation Areas A and B of a Subdivision constitutes more than fifty (50) percent of the entire Subdivision area, no Medium Priority Areas must be designated as Conservation Area.

b. For Parcels less than ten (10) acres and containing any amount of Conservation Area A, no conservation area is required for Medium Priority Areas.

4. Specific Design Requirements. The following specific design standards are required for all Conservation Area C locations.

a. Minimum Size of Conservation Area. There is no minimum contiguous area required.

b. Minimum Width of Conservation Area. The minimum width of the area in any location is thirty (30) feet.

c. Relationship with Other Conservation Areas. The area shall be contiguous with other Conservation Area A, Conservation Area B, and Conservation Area C areas, both on the Parcel and adjacent Parcels.

d. Impervious Coverage. A maximum of 5% of the Property's Conservation Area C may be covered in Impervious surfaces. An additional area of 5% may be Semi-Pervious.

e. Uses and Structures. All Uses, Accessory Uses, and Accessory Structures permitted in the OS5 district

are permitted in Conservation Area C. Refer to IV.2.
(1) Sports fields and playgrounds are not permitted.
(2) A Library/Museum (refer to IV.2.D.5) is permitted with following development standards.
(a) The Conservation Area C Lot must be a minimum of five (5) acres.
(b) The content of the facility must be oriented to the natural environment.
(c) The Civic Building Type (refer to IV.3.M) must be used for the Library/Museum.
(3) Accessory Structures are permitted only on Lots five (5) acres or larger.

5. Management Requirement. Management of Conservation Area C shall be defined in the Restoration and Management Plan (refer to III.2.C) with the following minimum requirements.
a. Avoid or minimize soil damage, compaction, or other impacts to soil health.
b. Establish a stable vegetative condition for the entirety of the Parcel. Remove invasive or noxious trees, shrubs, and herbaceous plants.
c. In wooded areas, thin all trees to allow a light level on the ground plane that can sustain suitable grasses and flowering perennials, approximately thirty (30) to eigthy (80) shade trees per acre.
d. Seed or plant bare (prepared) soil with suitable prairie, woodland, or meadow grasses.
(1) Provide adequate water, weed control, and other measures to allow healthy establishment of the vegetation.
(2) For warm season grasses, maintain with annual controlled prescription burning, or seasonal mowing, when burning is not feasible..
(3) For cool season grasses or meadows, maintain with seasonal mowing.
e. Improve and enhance biodiversity to the degree possible.

III. Resource Protection Regulations
Section 3 - Site Disturbance & Grading: General Requirements

A. General Requirements.

1. Intent. The following provisions are established to accomplish the following:
   a. Preserve existing topography, drainage patterns, perviousness, and soil characteristics to the extent possible.
   b. Site development shall be fitted to the topography and soil so as to create the least potential for tree and natural vegetation loss.

2. Applicability. The following standards apply to all Property.

B. Site Disturbance and Grading.

1. Site Disturbance. Limit site disturbance and any construction activities to the following maximum dimensions:
   a. Forty (40) feet beyond all building perimeters.
   b. Ten (10) feet beyond all surface walkways, patios, surface parking and utilities less than twelve (12) inches in diameter;
   c. Fifteen (15) feet beyond street curbs and utilities larger than twelve (12) inches.
   d. Twenty five (25) feet beyond constructed areas with permeable surfaces (permeable paving areas, stormwater detention facilities, playing fields) that require additional staging areas in order to limit compaction in the construction areas.

2. Conservation Areas. Conservation Areas as designated may not be disturbed. See III.2.

3. Confine construction, staging, and disturbance zones to only those necessary for the current stage of work, and to areas previously disturbed if possible.

4. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.

C. Grading and Slope Preservation.

1. Maximum Cut and Fill. The following maximums apply to all sites with the exception of street right-of-ways.
   a. Cuts may not exceed X feet of depth except for construction of a building foundation, basement or swimming pool excavation.
   b. Fill may not exceed X feet of depth.
   c. All cuts and fill must be restored and stabilized.

2. Steep slopes. Slopes greater then 15% across more than two (2) acres shall be protected and incorporated into Open Space or Landscape Areas.

D. Existing Vegetation and Soil Protection.

1. Intent. Protect existing soils and vegetation from disturbance during construction processes.
   a. To preserve existing Tree Canopy, natural vegetation, and s to the extent possible, until such time as an area is to be disturbed for development,
   b. To help hold soils in place, to enhance absorption, retention, and infiltration of precipitation and minimize runoff.
   c. To maintain infiltration and subsurface drainage of existing soils.

2. Site Vegetation and Soil Protection Plan. Develop a site vegetation and soil protection plan and designate areas outside the limits of disturbance as Protection Zones, including the following areas:
   a. All areas to be landscaped
   b. All areas to provide water infiltration per Stormwater Management Plan.
   c. All areas of existing landscape to be retained.
   d. All areas outside the limits of site disturbance. See III.3.B.1.

3. Install fencing along edges of Protection Zones before materials or equipment are brought on the site and construction operations begin.
   b. The following practices are prohibited within protection zones during construction:
      (1) Storage of construction materials, debris, waste, or excavated material.
      (2) Parking vehicles or equipment.
      (3) Foot traffic.
      (4) Erection of sheds or structures.
      (5) Impoundment of water.
      (6) Excavation or other digging unless otherwise indicated.
      (7) Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
      (8) Disposal of any waste material or substance.

4. Existing Vegetation to be retained. Tree and natural vegetation removal shall be limited to that amount necessary for the development of the site.

5. Construction Zone Soils. In unprotected locations receiving construction activities:

a. Maintain the infiltration and subsurface drainage capacity of existing soils to the extent possible by avoiding rutting and compaction wherever possible.
b. Regularly apply thick layers of mulch to minimize soil compaction in areas of high traffic.
c. Avoid working on wet soils with heavy equipment.

III. Resource Protection Regulations
Section 4 - Tree Management: General Requirements

A. General Requirements.

1. Intent. The disturbance of trees under any circumstances shall be regulated according to the provisions of this section with the following goals.
   a. To preserve, protect, and enhance valuable natural resources and to protect the health, safety, and welfare of residents.
   b. To establish standards limiting the removal of and insuring the replacement of trees sufficient to safeguard the ecological and aesthetic environment of a community.
   c. To prevent the unnecessary clearing and disturbing of land so as to preserve the natural and existing growth of vegetation and to replace removed trees with the same, comparable, or improved species.
   d. To guide the conservation, protection, maintenance, and establishment of trees in order to maximize Tree Canopy Coverage across the City.
   e. To increase the City's Tree Canopy cover wherever and whenever possible to preserve trees and community forest health.
   f. To establish provisions consistent with forestry policy and practice for urban areas promulgated by the State Division of Forestry in recognition that trees are a part of our heritage and our future, and that they are an essential part of the quality of life within the City.
   g. To maximize the benefits of trees and vegetation, including a reduction in the urban heat island effect, more sustainable management of stormwater, and filtration of particulate matter from the air, restoring oxygen to the atmosphere and reducing air pollution.

2. Applicability. The provisions in this section apply to any site disturbance activity on any Lot, such as Grade changes; construction, enlargement, or relocation of a Principal or Accessory Structure(s); development of such facilities as parking lots; and removal of trees not associated with construction or Subdivision activity, with the following exemptions.
   a. Tree farms with valid American Tree Farm System Certification are exempt from the tree removal requirements.
   b. Removal of trees from Lots zoned Agriculture, except as noted in the development standards detailed in IV.2.M(19).
   c. Removal of trees and vegetation according to IV.5.D Hazardous and Noxious Vegetation .ERIC PLS REVIEW VS. MUNICIPAL CODE

3. General Requirements. The following general requirements apply.
   a. Tree Size. Tree size shall be measured at four and a half (4 1/2) feet above the mean grade of the tree's trunk, noted as diameter breast height (DBH) throughout this Ordinance.
   b. Installation Standards. Refer to IV.5.B for tree installation requirements.

B. Plans and Surveys.

1. Intent. The plans and surveys detailed here aim to achieve the following goals.
   a. To ensure that development plans consider the existing tree cover in their design.
   b. To ensure that preserved trees are properly protected during site disturbance.
   c. To ensure that appropriate removal and replacement standards are followed.

2. Applicability. The survey and plans associated with this section are required as a part of various development activities and processes, as are detailed in I.4 Process Criteria and Applications.

3. General Requirements. All plans and surveys shall have a title block, including north arrow, graphic and written scale, street address, legal description, date of preparation, and the name, address, and telephone number of person preparing plan.

4. Tree Survey. A Tree Survey indicates the type, size, and health of trees on a Parcel and shall be utilized to inform the planning and design of said Parcel's development.
   a. Timing. Tree Surveys are completed as a preliminary step in a Parcel's development, to ensure that its results appropriately inform the development's design (refer to I.4 for information on which development processes require its completion).
   b. City Approval. The Tree Survey will be reviewed and the proposed protection and removal of trees will be approved or disapproved with the development approval application (refer to I.4)
   c. Qualified Surveyor. Survey shall be completed under the supervision of a ISA Certified Arborist, or other City approved professional arborist or forester.
   d. Survey Requirements. On a topographic survey, the following shall be indicated for all trees equal to and greater than six (6) inches in size and multi trunk trees within a three (3) square foot area, a collective Tree Canopy of twenty (20) square feet, and a total trunk size of eight (8) inches. ERIC ARE WE KEEPING STANDS

(1) Species (common and scientific names), size, and health.
(2) Location.
(3) Proposed designation as to be preserved or removed.
(4) Existing Tree Canopy.
(a) Delineate Canopy to be removed in gray.
(b) Assume two (2) feet of canopy per one (1) inch of tree at DBH.
(5) Delineate Conservation and Priority Areas, Specimen Trees, and Forest Stand Groups.
(6) Denote the percentage of Tree Canopy Coverage Requirements (refer to IV.5G-K) met through preservation of existing trees.
(7) Existing structures, power lines, easements, and other similar features.

5. Tree Replacement Plan. The Tree Replacement Plan illustrates the location, quantity, and quality of tree(s) to be planted on a site.
a. Timing. Tree Replacement Plans are completed at the beginning of the development process (prior to Preliminary Plat or Site Plan Approval) and additionally when required per II.4.C-E utilizing the results of the Tree Survey (refer to I.4 for information on which development processes require its completion)
b. City Approval. The Tree Replacement Plan will be reviewed and the proposed replacement will be approved or disapproved with the development approval application (refer to I.4).
c. Plan Requirements. Tree Replacement Plan shall detail the following.
(1) Dimensioned Property Lines.
(2) Existing and proposed structures, utilities (water, sewer, stormwater, gas, and electric), Easements, grading, and open space and recreation.
(3) Delineate Conservation and Priority Areas, Specimen Trees, and Forest Stand Groups.
(4) Location of existing trees proposed to be preserved and removed.
(5) Location of trees to be planted.
(6) Summary table of all trees removed and the required replacement trees planted by species and size.
(7) When applicable, denote the percentage of residential Tree Canopy Coverage requirements met through planting new trees.
d. Tree Bank. Proposed contribution shall be noted on the plan, including the number and size of trees for which the contribution is being made and the associated dollar amount. Refer to III.4.F for details and permission requirements.

6. Tree Protection Plan. Tree Protection Plans detail how preserved trees will be protected and cared for during a site disturbance and denote the areas of tree protection.
a. Timing. The tree protection plan shall be submitted with the Construction Plan application (refer to I.4.D) and with all construction and building permit applications.
b. City Approval. The Tree Protection Plan will be reviewed and the proposed protection methods will be approved or disapproved by the City. No site clearing or disturbance activities may commence until the City has approved the Tree Protection Plan.
c. Plan Requirements. Plan shall include the following information.
(1) Dimensioned Property Lines.
(2) Existing and proposed structures, utilities (water, sewer, stormwater, gas, and electric), Easements, grading, and open space and recreation.
(3) Project descriptions, including phasing details.
(4) Construction information, including construction equipment points of access, temporary roads, and location of staging areas for vehicles, material storage, and other related activities.
(5) Tree Survey.
(6) Critical Root Zone of preserved trees.
(7) Proposed method(s) and placement of tree protection.
(8) Special treatment plan, if applicable.

C. Landmark Trees.

1. Intent. To identify and preserve irreplaceable trees within the City.

2. Applicability. The Landmark Tree designation applies to all trees on all Lots in all Zoning Districts that meet the parameters of this subsection.

3. General Requirements. A Landmark Tree is a high value tree or high value Stand of trees, as determined by a registered forester, certified arborist, or other City approved professional arborist or forester using the following criteria.
a. Qualifying Tree Type. Tree shall not be listed on the most recent edition of the Tennessee Invasive Exotic Plant List.

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b. Size Criteria. Tree must equal or exceed one (1) of the following four (4) parameters.
(1) Thirty-six (36) inches for large hardwoods such as oaks, hickories, and sweetgums.
(2) Thirty (30) inches for large softwoods, such as pines and deodar cedars.
(3) Eight (8) inches for small trees such as dogwoods, redbuds, and sourwoods.
(4) A lesser sized tree, if it meets any one (1) of the following criteria
(a) Rare or unusual species, including but not limited to, species federally or state listed as endangered, threatened, or of special concern.
(b) Exceptional or unique quality, including but not limited to, a tree that is the only species of its kind or size within the project area, or a tree that provides habitat for a species that is state or federally listed as endangered, threatened, or of special concern.
(c) Historical significance, including but not limited to, trees listed on the state Champion Tree list.

c. Designation Criteria. A contiguous grouping of trees meeting any of the following criteria.
(1) Relatively mature tree Stand defined by the City's Natural Resource Assessment as a Stand Structure 3.
(2) A stand of rare or unusual nature such as stands composed of trees that are state or federally listed as endangered, threatened, or of special concern; or, stands that constitute habitat for species that are state or federally listed as endangered, threatened, or of special concern.
(3) A stand of historical significance, such as trees listed on the state Champion Tree list.

d. Condition Criteria. All Landmark Trees and Stands must be in fair or better condition and shall meet the following minimum standards.
(1) A life expectancy of greater than fifteen (15) years.
(2) A structurally sound trunk without having extensive decay.
(3) No more than one (1) major and several minor dead limbs.
(4) No major insect or pathological problems.

4. Removal and Replacement Parameters. Site design shall take the existence of Landmark Trees and Stands into consideration. These trees shall only be removed if, through the Tree Removal Permit process (I.4.R), the City finds other site development configurations are not viable and only in accordance with the following.

a. Tree Removal Permit. Requires approval of a Tree Removal Permit (refer to I.4.R).
b. Tree Replacement. Removed Landmark Trees on any Lot must be replaced at the following rate.
(1) Rate and Size,
(a) Trees shall be replaced at a rate of five hundred (500) percent of the DBH inches removed.
(b) Replacement trees shall be a minimum of three (3) DBH inches.
(3) Tree Replacement Plan Required. Proposed replacement trees shall be reviewed and approved through the submittal of a Tree Replacement Plan (refer to III.B.5).
(4) Location. Planting of replacement inches shall be on the same Parcel as the removed trees.
(5) Replacement Parameters. All of the following shall be met, unless otherwise approved with the Tree Replacement Plan (refer to III.B.5).
(a) Up to one (1) tree per two thousand (2000) square feet of Landscape Area may be planted on site.
(b) No more than fifty (50) percent of the required replacement inches may be planted on site.
(c) The replacement inches not physically planted shall be handled through a monetary contributed to the Tree Bank (refer to III.4.F).
(d) Trees installed in Landscape Areas per the requirements in IV.5.G-I may be utilized to satisfy tree replacement requirements.

5. Tree Protection Bond. A bond is required for Landmark Trees designated as preserved on all Lots undergoing a site disturbance (refer to III.4.H).

6. Protection During Construction. Refer to III.4.I for specific protection methods for Landmark Trees.

D. Specimen Trees.

1. Intent. To identify and preserve large trees within the City and to establish parameters for their removal and replacement.

2. Applicability. The Specimen Tree designation applies to all trees on all Lots in all Zoning Districts that meet the parameters of this subsection.

3. General Requirements. A Specimen Tree is a high value tree or high value Stand of trees, as determined by a registered forester, certified arborist, or other

City approved professional arborist or forester using the following criteria.

a. Qualifying Tree Type. Tree shall not be listed on the most recent edition of the Tennessee Invasive Exotic Plant List.
b. Size Criteria. Tree must equal or exceed one (1) of the following parameters.
   (1) Fourteen (14) up to thirty-six (36) inches for large hardwoods such as oaks, hickories, and sweetgums.
   (2) Ten (10) up to thirty (30) inches for large softwoods, such as pines and deodar cedars.
   (3) Six (6) up to eight (8) inches for small trees such as dogwoods, redbuds, and sourwoods.
c. Condition Criteria. All Specimen Trees must be in fair or better condition and shall meet the following minimum standards.
   (1) A life expectancy of greater than fifteen (15) years.
   (2) A structurally sound trunk without having extensive decay.
   (3) No more than one (1) major and several minor dead limbs.
   (4) No major insect or pathological problems.

4. Removal and Replacement Parameters. Site design shall take the existence of Specimen Trees into consideration. Removal of Specimen Trees shall adhere to the following.
   a. Tree Removal Permit. Requires approval of a Tree Removal Permit (refer to I.4.R).
   b. Tree Replacement. Removed Specimen Trees must be replaced according to the following parameters.
      (1) Exception. Replacement of trees removed from a Lot developed with or being developed for single family (refer to Building Types IV.4.N-U) is only required up to the point where that Lot satisfies the Tree Canopy Coverage Requirements (refer to IV.5.G). If a Lot meets the Tree Canopy Coverage Requirement prior to the installation of replacement trees, no replacement is required.
      (2) Rate. Trees shall be replaced at a rate of one hundred (100) percent of the DBH inches removed.
      (3) Tree Replacement Plan Required. Proposed replacement trees shall be reviewed and approved through the submittal of a Tree Replacement Plan (refer to III.B.5).
      (4) Location. Planting of replacement inches shall be on the same Parcel as the removed trees.
         (a) Trees installed in Landscape Areas per the requirements in IV.5.G-I may be utilized to satisfy tree replacement requirements.
         (b) Street trees per II.8 Street Type Standards may be utilized to satisfy tree replacement requirements.
      (5) Replacement Parameters. All of the following shall be met, unless otherwise approved with the Tree Replacement Plan (refer to III.B.5).
         (a) Up to one (1) tree per two thousand (2000) square feet of Landscape Area may be planted on site.
         (b) No more than fifty (50) percent of the required replacement inches may be planted on site.
         (c) The replacement inches not physically planted shall be handled through a monetary contributed to the Tree Bank (refer to III.4.F).
         (d) Trees installed in Landscape Areas per the requirements in IV.5.G-I may be utilized to satisfy tree replacement requirements.

5. Tree Protection Bond. A bond is required for Specimen Trees designated as preserved on all Lots undergoing a site disturbance (refer to III.4.H).

6. Protection During Construction. Refer to III.4.I for specific protection methods for Specimen Trees.

E. Non Landmark, Non Specimen Trees.

1. Intent. To establish parameters for the reasonable removal and replacement of Non Landmark, Non Specimen Trees within the City.

2. Applicability. These standards apply to all trees not designated as Landmark or Specimen Trees on all Lots in all Zoning Districts that meet the parameters of this subsection.

3. General Requirements. These trees meet the following criteria, as determined by a registered forester, certified arborist, or other City approved professional arborist or forester.
   a. Qualifying Tree Type. Tree shall not be listed on the most recent edition of the Tennessee Invasive Exotic Plant List.
   b. Size Criteria. Trees not designated as Landmark or Specimen Trees that are greater or equal to six (6) DBH (hard and softwood).
   c. Condition Criteria. Trees must be in fair or better condition and shall meet the following minimum standards.

(1) A life expectancy of greater than fifteen (15) years.
(2) A structurally sound trunk without having extensive decay.
(3) No more than one (1) major and several minor dead limbs.
(4) No major insect or pathological problems.

4. Removal and Replacement Parameters. Site design shall take the existence of trees into consideration. Removal shall adhere to the following.
   a. Tree Removal Permit. Requires approval of a Tree Removal Permit (refer to I.4.R).
      (1) Exception. A permit is not required if all of the following are met.
         (a) Lot is developed with or will be developed for single family (refer to Building Types IV.4.N-U).
         (b) Lot will be able to meet the Tree Canopy Coverage Requirements (refer to IV.5.G) despite the proposed removal.
         (c) The trees proposed for removal are each under ten (10) DBH inches.
   b. Tree Replacement. Removed trees must be replaced according to the following parameters.
      (1) Exceptions for Single Family Development
         (a) Replacement is not required for Lots meeting the criteria in III.4.E(4)(a)(1) above.
         (b) Replacement is only required up to the point of meeting the Tree Canopy Coverage Requirements (refer to IV.5.G).
      (2) Rate. Trees shall be replaced at a rate of seventy-five (75) percent of the DBH inches removed.
      (3) Tree Replacement Plan Required. Proposed replacement shall be reviewed and approved through the submittal of a Tree Replacement Plan (refer to III.B.5).
      (4) Location. Planting of replacement inches shall be on the same Parcel as the removed trees.
         (a) Trees installed in Landscape Areas per the requirements in IV.5.G-I may be utilized to satisfy tree replacement requirements.
   c. Thinning. Non Landmark, Non Specimen Trees may be removed without replacement requirements if a thinning plan is developed and approved with the following criteria.
      (1) The proposed thinning is to promote the health of the forested area.
      (2) Thinning plan must be developed by a certified forester.
      (3) The plan shall be approved through the Tree Permit Process.

5. Tree Protection Bond. A bond is required for trees designated as preserved on all Lots undergoing a site disturbance (refer to III.4.H).

F. Tree Bank.

1. Intent. To provide an alternative method of compliance with the tree replacement requirements of this Ordinance. It is primarily intended for circumstances where on-site planting of replacement trees is not possible due to the physical condition of a Lot.

2. Applicability. A contribution may be made to the Tree Bank by any Applicant of property owner responsible for replacing removed trees, with City approval.

3. Authority. Utilization of the Tree Bank requires the City's approval.
   a. Proposed use of the Tree Bank shall be detailed by the Applicant in the Tree Replacement Plan (refer to III.B.5).
   b. City shall review the Tree Replacement Plan submitted with the Applicant's development application (such as Tree Removal Permit, Preliminary Plat, and Site Plan Review refer to I.4 Process Criteria and Application for complete details on which processes require the submittal of this Plan).
   c. The Parks Board and the Natural Resource Board (NRB) shall review proposed Tree Bank donations during the administrative review step of the application process (refer to I.4 for an outline of each development process) and provide a recommendation to the Code Administrator.

4. Contributions. Contributions are calculated based upon tree designation.
   a. Landmark Trees. Contribution is determined by multiplying one thousand (1000) dollars by the DBH inches that are not to be planted on-site.
   b. Specimen Trees. Contribution is determined by multiplying four hundred and fifty (450) dollars by the DBH inches that are not to be planted on-site.
   c. Non Landmark or Non Specimen Trees. Contribution is determined by multiplying one hundred and twenty-five (125) dollars by the DBH inches that are not to be planted on-site.

5. Other Donations. Tree protection and establishment bonds (refer to III.4.H) forfeited due to failure to comply with these provisions shall be deposited in the Tree Bank.

G. Violations.

1. Intent. To provide the City with specific recourse, if the provisions of this section are not adhered.

2. Applicability. In addition to the standards outlined in I.1.H Violations and Penalties, the following may be applied to anyone in violation of the provisions of this section.

3. Penalties. The following penalties may be applied to anyone found in violation of this section.
   a. Revoke Permits. The City may revoke all permits until the matter is resolved.
   b. Required Tree Replacement. Illegally removed trees shall be replaced as follows.
      (1) Landmark Trees shall be replaced at a rate twice that of what is required for legal removal.
      (2) Specimen Trees shall be replaced at a rate of one and half (1 1/2) that of what is required for legal removal.
      (3) Non Landmark, Non Specimen Trees shall be replaced at a rate of one and half (1 1/2) that of which is required for legal removal.
      (4) Tree Bank donations (refer to III.4.F) shall be at a rate of one hundred and ten (110) percent of the stated contribution rates.
   c. Location. Trees shall be replaced on the same Lot as the removed tree.
   d. Required Replacement. Imposition of any penalty for a violation of this subsection shall not be construed as a waiver of the right of the City to collect from the defendant the cost of tree work done by the City which the defendant was required but failed to act upon.

H. Security.

1. Intent. To ensure that newly planted trees and those designated as to be protected during site development are appropriately managed.

2. Applicability. Bonds may be required in the following circumstances.
   a. Tree Protection Bond. Bond is required for those receiving Plat, Minor Site Plan, and Site Plan approvals (refer to I.4.C-E and H-I) or other development or building permits that have trees designated as to be protected during site development activities.
   b. Tree Establishment Bond. Bond is required for those planting trees per the requirements of this Ordinance on public or private property.

3. Tree Protection Bond. Bond requires an escrow deposit, bond, or irrevocable letter of credit in an amount equal to the cost of replacing the trees designated as to be protected (using the Council of Tree and Landscape Appraiser's or similar City approved organization's tree appraisal estimates) and associated labor.
   a. When the project involves a development agreement (refer to I.5.A), this requirement shall be included in this agreement; a separate security is not required.
   b. Bond shall be held for three (3) years from the date of receipt of the certificate of occupancy (I.4.Q) or certificate of completion, unless violations of the Tree Protection Plan (refer to III.4.B(6)) or the standards outlined in III.4.I were cited. If violations were found, the bond shall be held for a period of five (5) years.

4. Tree Establishment Bond. Bond requires, upon receiving final Plat approval (refer to I.4.E), certificate of occupancy (refer to I.4.Q), or certificate of completion, an escrow deposit, bond, or irrevocable letter of credit in an amount equal to the cost of replacing the newly planted tree (using the Council of Tree and Landscape Appraiser's or similar City approved organization's tree appraisal estimates) and associated labor.
   a. Bond shall be posted by the Applicant or property owner of any Lot on which plantings are required per the requirements of this Ordinance.
   b. City shall hold the bond for a minimum of two (2) and a maximum of four (4) years.

I. Tree Protection During Construction.

1. Intent. Protection measures shall be undertaken to preserve designated trees during site development and construction.

2. Applicability. On all Lots in all Zoning Districts, trees determined to be preserved, shall be protected utilizing the provisions outlined herein.

3. Tree Protection Plan. An approved Tree Protection Plan, detailing which of the following protection methods will be utilized, is require prior to commencing any site clearing or disturbance activities (refer to III.4.B(6)).

4. Prohibited Activities. Within protection areas, the following activities shall be prohibited:
   a. Vehicle traffic or parking.
   b. Materials or equipment storage.

c. Soil disturbance.
d. Soil excavation.
e. Removal of topsoil.
f. Trenching.
g. Soil fill.
h. Change in soil pH.
i. Change in soil drainage.
j. Equipment washouts or disposal (including concrete).
k. Fires.
l. Chemical or trash disposal.
m. Other activities harmful to the trees as determined by the Code Administrator.

5. Special Treatment. To ensure the health of certain preserved trees, unique care may be required for protected trees during a site disturbance.
   a. Triggers for special treatment.
      (1) All Landmark Trees must be under the care of a certified arborist or forester.
      (2) City may require special treatment for Specimen Trees as a condition of approving the Tree Protection Plan (refer to III.4.B(6).
      (3) During the site disturbance or construction activity, the City may required special treatment if:
         (a) A violation of the tree protection standards is found.
         (b) A preserved tree, regardless of classification, is found to be stressed or in poor health.
   b. Requirements. All treatments must be approved by the City. A certified arborist or forester must perform the following.
      (1) Visually inspect trees and perform any testing required.
      (2) Develop special treatment based upon conditions of the tree.
      (3) Conduct inspections to monitor treatment progress.

6. Protection Methods During Construction. Protective barriers are required to prevent injuries caused by soil compaction, unnecessary cutting of roots, fire, collisions with heavy equipment, carelessness with tools or girding with guy wires and injury caused by solvents, paints, oils, or other chemicals.
   a. Protect the Critical Root Zone. Enclose preserved trees in designated tree protection areas, noting location on the Tree Protection Plan, with standard orange barricade fencing or comparable fencing material approved by the Code Administrator.
      (1) Such fencing shall be four (4) feet in height and supported by metal channel posts spaced a maximum of ten (10) feet on center.
      (2) Fencing shall be placed around all trees to be preserved.
      (3) Barrier shall be easily visible to equipment operators.
      (4) Hand tools only shall be utilized to remove brush or weeds within the barrier.
   b. Sediment and Siltation. In addition to the protection fencing, filter fabric fence, silt fence, or super silt fence may be required along the limits of grading to protect the areas of tree preservation from sediment and siltation.
   c. Bark Protection. Tree trunks within fifteen (15) feet of a building site or access road shall be wrapped with sections of protection fencing or boards wired together.
      (1) No nails or spikes shall be driven into preserved trees.
      (2) No preserved trees shall be used for signs, fencing, roping, or cables.
   d. Watering. Regular watering may be required.
   e. Mulch. Critical Root Zone shall be mulched with a minimum of three (3) and a maximum of eight (8) inches of organic mulch material such as pine, straw, wood chips, tree leaves, or compost.
   f. Construction Dust. Tree Leaves must be kept free of construction dust to prevent dessication.

7. Grade Changes. Grading in and around the Critical Root Zone of a tree shall adhere to the following.
   a. Grading within the Critical Root Zone of Landmark and Specimen Trees are prohibited.
   b. Grading along the perimeter of the Critical Root Zone for Landmark and Specimen Trees may occur providing the following parameters.
      (1) Raising of Grade. Up to a three (3) feet change is permitted along the perimeter of a tree's Critical Root Zone provided that an aeration system and retaining wall are installed.
      (2) Lowering of Grade. Grade may not be lowered more than two (2) feet along the Critical Root Zone's perimeter. Terracing away from the Critical Root Zone is permitted at increments of two (2) feet.
      (3) Positive Drainage. Significant changes in drainage shall be rectified by cutting Swales or other means previously approved in the Tree Protection Plan (refer to III.4.B(6)).
   c. Grading within and around the Critical Root Zone of a Non Landmark, Non Specimen Tree is permitted with the following requirements.
      (1) Avoid grade changes within the Critical Root Zone if alternatives are feasible.

(2) Grading is prohibited within the fifty (50) percent of the Critical Root Zone adjacent to the protected tree's trunk or half of the radius of the Critical Root Zone measured from the trunk.
(3) Grade Change. Up to one (1) foot of change, raising or lowering, is permitted in the outer Critical Root Zone.
(4) Positive Drainage. Significant changes in drainage within and along the Critical Root Zone shall be rectified by cutting Swales or other means previously approved in the Tree Protection Plan (refer to III.4.B(6)).

8. Excavation. Excavation is not permitted within the Critical Root Zone of Landmark and Specimen Trees. For all other trees, minimize the damage by limiting excavation and providing proper root care after any excavation.
   a. Utility Easements shall not be routed within the Critical Root Zone of a tree unless otherwise approved because:
      (1) No other route is practical.
      (2) Tunnelling under the roots with a power-driven soil augur is impractical or financially infeasible in relation to the value of the tree.
   b. Root Protection. When excavating in the Critical Root Protection Zone, the following cautionary steps shall be taken.
      (1) Minimize the number of roots cut, especially structural roots.
      (2) Make clean cuts with proper tools and re-trim the roots after excavation.
      (3) Keep exposed roots moist by covering with burlap or similar material and watering at least once per day until trench is filled.
      (4) To minimize the time roots are exposed to the air, backfill the trench as soon as possible after excavation, leaving no pockets of air.
      (5) Mix peat moss with fill soil to promote new root growth.

9. Removal of Tree Protection. Protective fences and barriers around trees shall be removed only as the final stage of post-construction cleanup.

A. Pre-Construction.

All development shall be planned and designed to minimize soil erosion and sedimentation of drainageways using the following principals.

1. Plan the development to fit the existing topography, soils, drainage patterns, and natural vegetation of the site.

2. Minimize the amount of cut and fill.

3. Retain and protect natural vegetation and soil structure whenever it is feasible.

B. Soil Erosion and Sediment Control Plan.

A Soil Erosion and Sediment Control (SESC) Plan is required in accordance with the General Criteria established in the Tennessee Department of Environment and Conservation Erosion Sediment Control Handbook.

1. The erosion control plan shall be designed and worded to address all potential field conditions to ensure compliance with the intent of the ordinance.

2. The erosion and sediment control plan, at minimum, shall include the following:
   a. A list and brief description of each control measure that will be used.
   b. A Scaled site map clearly showing the existing and proposed contour lines, drainage ways, north arrow and location and type of each erosion and sediment control measure.
   c. An implementation sequence indicating the order in which the erosion and sediment control activities will take place.
   d. An inspection and maintenance schedule for all disturbed areas, material storage areas and erosion and sediment controls that were identified in the plan. This schedule should identify, at a minimum, all erosion and sediment control measures to be inspected every seven (7) calendar days and within 24 hours of any storm event exceeding 1/2-inch precipitation.
   e. Designated areas for equipment maintenance and repair.
   f. Provisions for waste receptacles at convenient locations, the regular collection of waste, protected storage areas for chemicals, paints, solvents, fertilizers and other potentially toxic materials and adequately maintained sanitary facilities.

C. Soil Erosion and Sediment Control Techniques.

1. Phasing and Disturbance.
   a. Minimize the extent of the area exposed at one time and the duration of the exposure.
   b. Stabilize disturbed areas immediately after soil exposure or disturbance or after final Grade has been attained.
   c. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross Protection Zones, see III.3.C.2.
   d. No soil storage piles shall be located with a downslope drainage length of less than thirty-five (35) feet from wetlands, channels, detention basins or drainage Swales.
      (1) Cover or vegetate (with an appropriate grass matrix) soil stock piles that remain on site longer than two weeks.
      (2) Filter fence or equivalent should be installed at a minimum distance of ten (10) feet from stockpile edge to reduce water build-up behind fence and potential failure of sediment control structure.
      (3) Do not store soil stockpiles within drip line of remaining trees or within protection areas.
   e. Erosion and sediment controls shall remain in place and in functioning condition for the duration of construction activity and until the areas that they protect are completely stabilized.
   f. At the completion of the project, stormwater management facilities will be inspected by the City Engineer to determine any cleaning of flushing of trapped sediment which may be required due to erosion. The responsibility for that work lies with the site developer.

2. Erosion Control Practices:
   a. Apply perimeter control practices such as silt fences or earthen dikes to protect the disturbed area from offsite runoff and to filter concentrated runoff from the site to prevent sedimentation damage to areas below/downslope of the development site.
   b. Remove sediment from storm water before it leaves the site by allowing runoff to pond in controlled areas (traps or basins) or by using vegetative cover, silt fences or hay bales.
   c. Keep runoff velocities low and retain runoff on the site.
   d. Direct upslope water to other rainwater facilities to avoid disturbed areas.

e. Transport surplus surface runoff down steep slopes through lined channels or piping. Ensure appropriate conditions at the bottom of the slope to avoid any impact from piped or channeled water and diffuse the energy and volume of the storm flow.
f. Straw bales or silt fence filters are required around inlet structures, catch basins, manholes, and other stormwater management facilities and structures.
g. Construction entrances...
h. Washing or cleaning of equipment shall be relegated to a designated area with appropriate controls.
g. Examples of acceptable temporary structural SESC controls include, but are not limited to, the following: diversion, silt fences, straw bale barriers, storm drain inlet protection, outlet protection, sediment traps, sediment basins, slope drains, subsurface drains, riprap, check dams, level spreaders, paved flumes, construction road stabilization and temporary gravel construction entrances and exits.
h. Examples of acceptable vegetative SESC controls include, but are not limited to, the following: vegetative buffer zones, protection of trees, lime stabilization, temporary seeding, permanent seeding, mulching, topsoiling, erosion & sediment control blankets and surface roughening. Sod is not an acceptable vegetative SESC control.
i. If it is necessary to remove topsoil, remove sod and grass before stripping and reuse topsoil on site. Grade and shape topsoil stockpiles to drain surface water and cover stockpiles to prevent erosion by wind or water. Do not stockpile topsoil within Protection Zones. If supplemental topsoil is needed beyond what is available on site, obtain from a local source.

3. Revegetation and Stabilization.
a. When natural drainage ways, including stream channels, are disturbed, re-vegetate stream banks with suitable native vegetation, and with appropriate soil stabilization and establishment practices.
b. All disturbed areas shall be stabilized with appropriate temporary or permanent measures within seven (7) calendar days of final grading or when left idle for more than seven (7) days, excluding maintained haul roads, sediment basins, site runoff storage facilities, and utility corridors less than twenty (20) feet in width. If work is discontinued for thirty (30) days or more in a disturbed area before the project is completed, appropriate interim controls shall be initiated within seven (7) calendar days from the day that work was discontinued.

4. Inspection and Maintenance
a. Inspect, maintain, and repair SESC measures during construction until permanent vegetation has been established.
b. Damaged and ineffective erosion control measures shall be repaired, replaced or supplemented within forty-eight (48) hours of discovery or as soon as field conditions allow.
c. Straw bales and silt fences shall be inspected weekly and after rainfall event in excess of one half inch to determine required repairs and/or replacement. As a minimum, straw bales are to be replaced every three months or more frequently as required by the City Engineer. If tributary drainage area is greater than one acre, sediment basins shall be constructed in addition to using straw bales and silt fences.

D. Post Construction Restoration.

1. Vegetation native to the site or plant community shall be restored in areas affected by construction activities. Temporary vegetation, sufficient to stabilize the soil, may be required on all disturbed areas as needed to prevent soil erosion.

2. Following development, restore the infiltration capacity, improve soil health, and reduce compaction of soils by breaking up compaction, adding organic matter, and planting vegetation.