SECTION 1 - INTRODUCTION
Trees both in woodlands and in the landscape are recognized as an asset to the Town of Sandwich by providing a more healthful and beautiful environment in which to live. Trees and other vegetation provide oxygen, shade, protection from wind, glare, noise, unwanted views and control storm water runoff. They create wildlife habitats and add to the aesthetic and monetary values of property while providing a psychological and physical buffer to the man-made urban setting. Trees have been shown to be economically beneficial in attracting new residents, visitors, and industry to communities. When grown in the right location, and using proper varieties, trees can enhance the value and marketability of property and promote stability of desirable neighborhoods and commercial areas.

SECTION 2 - PURPOSE
The Town of Sandwich intends to enhance the appearance of the Town by protecting existing public shade trees and beautifying public right of ways with additional shade trees and ornamental plantings. The Town has invested significant resources to plant and maintain trees for the benefit of the residents and visitors of Sandwich. The Town also recognizes the need for a reliable network of public utilities and further development of private property. These regulations are intended to establish minimum standards for the pruning, removal and planting of public street and shade trees as well as standards for construction activities that may impact these trees.

SECTION 3 - APPLICABILITY
This regulation provides full power and authority over all trees, plants and shrubs located within street right-of-ways, parks and public places of the town; and to trees, plants and shrubs located on private property that constitute a hazard or threat as described herein. These regulations are promulgated pursuant to the authority of M.G.L., c.87, §2 (Shade Tree Act) and apply to utility companies, landscape companies, tree care companies and any and all other persons or entities who plan to work on public shade trees. The regulations also apply to contractors, builders and any and all other persons or entities who may impact, injure or excavate within the proximity of the trunk, branches or critical root zone of public shade trees.

These regulations shall apply to activities including but not limited to new utility line construction, existing utility line maintenance and line clearance, pruning of public shade trees, excavation of areas within the critical root zone of public shade trees, and intended removal of all or parts of public shade trees.

Adopted by Board of Selectmen – April 1, 2004
SECTION 4 - DEFINITIONS
The following definitions shall apply to the regulation and control of all trees under the jurisdiction of the Town of Sandwich pursuant to the Shade Tree Act - M.G.L.c.87.

**Arboriculture** - The art, science, technology, and business of utility, commercial, and municipal tree care.

**Arborist** - An individual engaged in the profession of arboriculture

**Bark** - The protective covering of trees. Bark is made up of living and dead cells. Bark keeps moisture and gases in and resists attack by insects and microorganisms.

**Bark, inner (phloem)** - Phloem, or inner bark, is a transport tissue. It transports energy-containing substances made the leaves to other parts of the tree.

**Callus** - Callus is a soft, non-woody tissue that forms about the edges of fresh wounds. After several weeks to a few months, during the period, it is replaced by wound wood.

**Caliper** - A standard trunk diameter measurement for nursery grown trees taken 6 inches above the ground for trees up to and including 4 inches diameter, and 12 inches above the ground for trees up to 6 inches in diameter.

**Cellulose** - A carbohydrate and the chief component of a plant’s cell wall.

**Cambium** - The layer of cells lying between the wood and bark of a stem from which new bark and wood cells originate.

**Crown** - Upper part of a tree, including the branches and foliage.

**Critical Root Zone (CRZ)** - a circular region measured outward from a tree trunk representing the essential area of roots that must be maintained in order for the tree’s survival. The critical root zone is generally one foot of radial distance for every inch of tree DBH, with a minimum circular diameter of 8 feet. The CRZ is used as a general guideline for root preservation. Actual root growth essential to the tree’s existence may exceed or vary from the initial CRZ designation.

**Deciduous Tree** - Sheds foliage at the end of the growing season.

**Diameter at Breast Height (DBH)** - The tree trunk diameter measured around the outside of the bark, 4.5 feet above ground level.

**Drip Line** - A vertical line extending from the outermost edge of the tree canopy or shrub branch to ground.

**Evergreen** - Having foliage that persists and remains green throughout the year.

**Foliage** - Leaves of a plant in general. Specialized as a photosynthetic organ.

**Girdling** - The choking of a tree stem or branch either accidentally through a material applied by a human, such as a wrap used in grafting, or through a vine that has vigorously enwrapped a
tree, such as bittersweet. Girdling can also occur from an encircling cut into the xylem of the stem or branch.

**Girdling Root** - The choking of a tree's lower trunk or roots by other roots that encircle the trunk or root.

**Landscaping** - The process or product of site development including grading, installation of plant materials, and seeding or sodding of turf grass or installation of ground cover.

**Leader** - The primary stem of a plant, usually the top stem.

**Lignin** - Cells in the tree and other vascular plants that help make up the plant's secondary wall. After cellulose, lignin is the most abundant plant polymer.

**Mulch** - A protective covering, usually organic, placed around plants to keep in moisture and prevent the growth of weeds.

**Ornamental Tree** - A small to medium tree generally growing fifteen to forty feet in height at maturity. Ornamental trees are planted for aesthetic purposes such as colorful flowers, interesting bark, or fall foliage.

**Person or entity** - Any person, firm, partnership, association, corporation, company or organization of any kind including public or private utility and municipal departments.

**Proximity** - An area surrounding a Public Shade Tree when working within may cause harm to trunk, branches, and roots. Also see Critical Root Zone

**Public Shade Tree** - All trees within a public way or on the boundaries thereof, and for that reason it is doubtful whether the tree is within the highway, it shall be taken to be within the highway and to be public property until the contrary is shown.

**Qualified Arborist** - An individual who, by possession of a recognized degree, certification, or professional standing, or through related training or on the job experience, or both, is familiar with the hazards of pruning, trimming, repairing, maintaining, or removing trees, and with the equipment used in such operations, and has demonstrated his/her ability in the performance of the specialized techniques involved.

**Qualified Personnel** - An individual who, by reason of training and experience, has demonstrated the ability to safely perform assigned duties and, where required, is properly licensed in accordance with federal, state, or local laws and regulations.

**Roots (non-woody)** - Non-woody tree roots are organs that absorb free water and elements dissolved in it from the soil. Non-woody absorbing roots have very little lignin and no corky outer bark.

**Roots (woody)** - Woody tree roots are organs that support the tree mechanically, store energy reserves, transport free water and the substances dissolved in it. They also hold water in the form of bound water and contain more lignin than non-woody roots.
Root Collar - The transition zone between stem and root at the ground level of a tree or seedling. Also referred to as the Trunk Flare.

Sapwood (Xylem) - The living wood of pale color next to the bark. It is formed from the cambium and conducts water and minerals from the roots to the leaves.

Scaffold Branch - One of the primary limbs radiating from the trunk of a tree, from which all subordinate branches stem.

Scenic Road - A Town-owned road designated as "scenic" by a Town Meeting in accordance with M.G.L., c. 40, §15C. Any repair, maintenance, reconstruction, or paving work done with respect to these shall not involve or include the cutting or removal of trees, except with the prior written consent of the Scenic Road Committee after a public hearing.

Scenic Road Committee - All members of the Planning Board, the Tree Warden or any acting or temporary Tree Warden.

Shade Tree - A large growing tree usually over forty feet in height at maturity, usually deciduous, to provide canopy cover and shade.

Shall - as in these regulations denotes a mandatory requirement

Street Tree - A tree along a street right of way.

Topping - Topping refers to cutting a tree back nearly to the trunk. Topping is usually a one-time, desperate action and considered a highly disreputable procedure.

Tree Lawn - The (usually) narrow area of green space between the curb and the sidewalk.

SECTION 5 - PERMIT REQUIRED FOR WORK ON OR ADJACENT TO TOWN TREES

5.1 Activities Requiring a Permit
A. A valid permit to work on public shade trees shall be obtained prior to doing any of the following:
   1) Trimming of public shade trees
   2) Removal of public shade trees
   3) Planting of trees and/or shrubs within the public right of way
B. A valid permit shall be obtained prior to performing work that may disturb the branches, trunk or roots of public shade trees. This includes but is not limited to installation of utilities, natural gas lines, water lines, conduits, sewers, sidewalk construction/repair, driveways and curbing.
C. Excavation within or adjacent to the public right of way (or property), which may disturb roots and branches of public shade trees.

5.2 Activities Not Requiring a Permit
A. Clearance of trees and brush under or adjacent to high voltage, cross-country transmission lines unless such lines cross over a public right of way.
B. Work being done by the Town of Sandwich, or under contract to the Town of Sandwich, except where tree removal is subject to M.G.L., c. 87 that governs the removal of public shade trees.
C. Maintenance and beautification of trees and shrubs within the public right of way which may overhang private property, by the property owner, except where tree removal is subject to M.G.L., c. 87 that governs the removal of public shade trees.

5.3 Application Requirements

Application for a Tree Work Permit shall be made to the Tree Warden a minimum of thirty (30) calendar days prior to commencement of planned work, except in an emergency. For all planned work that would take place within an area over which the Conservation Commission has jurisdiction, no work may begin until the Conservation Commission has approved the work or determined the approval is not required. Where such tree work will impact a Scenic Road, an application for a work permit must be obtained from the Office of Planning and Development under the Scenic Road Act; M.G.L, c. 40 §15C prior to acceptance. The application shall include the following information:

A. A completed application form and site plan clearly identifying the proposed scope of work.
B. If public shade trees are proposed to be removed and replaced, a plan of sufficient scale and detail shall be submitted to the Tree Warden. The plan shall show the proposed location, diameter and species of the replacement tree plantings.
C. The tree or trees proposed to be cut, pruned or removed shall be flagged by the applicant and remain flagged until public hearing is closed.
D. If the proposed work requires a public hearing, the applicant shall also provide with the application a check made out to the entity that will publish the notice of public hearing advertisement in an amount sufficient enough to cover the cost of publication.

SECTION 6 - GENERAL REQUIREMENTS

6.1 Working on or impacting public street and shade trees

A. All plans for work on public street and shade trees, or work that may impact public street and shade trees shall be submitted to the Tree Warden for inspection prior to work commencement.
B. It is the obligation of the person or entity responsible for working on these trees to positively verify that the trees to be worked on (or those that may be impacted), are growing in the public right of way.
C. All pruning, trimming and utility line clearance on public trees shall take place so as to avoid to the maximum extent possible, the chances of insect infestation and environmental stresses.
D. No person or other entity can plant a tree or a shrub within the public right of way without first obtaining a permit from the Tree Warden.
E. All pruning, removal, trimming and planting of public shade trees shall be performed by qualified personnel who shall be adequately insured unless specified otherwise by the Tree Warden.
F. In the event of a utility emergency that threatens power, and involves public shade trees, the person or entity and any and all persons or entities responsible for taking action during such circumstances shall notify the Tree Warden of what actions were taken within two (2) business days.
G. In major, regional storm emergencies the person or entity and any and all persons or entities responsible for taking action in the circumstances shall notify the Tree Warden as soon as reasonable after the emergency.

Adopted by Board of Selectmen – April 1, 2004
H. All work on or in proximity to public shade trees shall be supervised by an attending Massachusetts or International Society of Arboriculture Certified Arborist, who shall be responsible for the work performed. The arborist shall maintain regular contact with the Tree Warden.

I. The person or entity and any and all other persons or entities shall be responsible for ensuring all workers are properly trained for the job at hand and knowledgeable of the standards of this ordinance, and the Occupational Safety and Health Administration and the American National Standards Institute safety standards relevant to the work being performed. These may include but are not limited to the following:


J. The Tree Warden will inspect all work upon its completion. Unsatisfactory work shall be corrected by the person or entity responsible for the work to the satisfaction of the Tree Warden.

6.2 Replacement of Town Trees

A. All proposed tree removal plans shall specifying the number of trees to be removed, their species, size (DBH) and location where the removal process will take place. The Tree Warden shall be notified of such plans at least sixty (60) calendar days before the plan is scheduled to start. All tree removal plans will be subject to a tree replacement program.

B. Public street and shade trees to be removed, or which have been removed, shall be replaced, in kind, and are subject to approval of a plan detailing their species and location. All planting locations are to be pre-approved by the Tree Warden fifteen (15) calendar days before planting commences.

C. Replacement trees shall be a minimum of 2 to 2.5 inch caliper, and of a species approved by the Tree Warden. Smaller diameter trees will be accepted upon the approval of the Tree Warden.

D. Each replacement tree shall be maintained and guaranteed by qualified personnel, or person or other entity responsible for planting the tree, or other person or entity approved by the Tree Warden for a period of 2 years from the time of planting.

6.3 Compensation for trees damaged, destroyed or removed

In the event that a public shade tree is subject to these Regulations is damaged, destroyed or removed without compliance with the provisions of these Regulations, the following standards shall apply regarding compensation to the Town for such damage.

A. Replacement cost of that tree if it is less than 6 inches DBH.

B. Council of Tree and Landscape Appraisers Trunk Formula Method if it is over 6 inches in diameter.

C. Or any other recognized methodology used in the industry at the Tree Warden's sole option.

D. Compensation amounts may be donated to the Town in the form of tree planting, services in kind and monetary donations. If a donation to the Town is not acceptable, the compensation amount will be imposed as a fine and deposited in the Town's general fund.
E. In lieu of pursuing enforcement options, as provided for in these regulations, the Tree Warden may accept a gift or donation to a tree replacement fund established and administered pursuant to M.G.L. c.44, §53A.

6.4 Tree removal
Removal of public shade trees shall be approved through the public notification and hearing process put forth in M.G.L. c.87, §3. An applicant who wishes to remove a non-hazardous public shade tree is responsible for the following expenses:
   A. Legal advertising.
   B. Cost of removal of tree and stump, including hauling away of all debris and properly filling stump hole.
   C. Planting of acceptable replacement trees as provided in Section 6.2.
   D. Cost of police traffic details, repair of street surface, sidewalk and road shoulder and protection and restoration of utility lines and structures if necessary.
   E. All other costs relating to tree removal and replanting.
   F. Removal of public shade trees shall be performed in such a way as to not damage adjacent trees, shrubs or structures.

6.5 Hazardous, dead or diseased trees on private property
A tree located on private property that poses a threat to public safety or adjacent property, or harbors a disease that could threaten public shade trees, or trees on adjacent property, shall be removed by the property owner within sixty (60) calendar days of written notice by the Tree Warden. In the event the property owner does not comply with such notification, the Town shall have the right to remove the tree at the expense of the property owner.

6.6 Brush, Wood and Debris Removal
All debris resulting from tree pruning, trimming or removal shall be removed by the person or entity at the end of each workday unless specified otherwise by the Town of Sandwich Department of Public Works. Disposal of said debris is the responsibility of the person or entity and shall be removed from the site unless directed otherwise by the Department of Public Works.

6.7 Stump Removal
Stumps remaining from tree removal operations shall, at the direction of the Tree Warden, be either cut flush with the ground level, completely removed and or ground to at least 6 inches below the soil level. Chips and debris resulting from the stump grinding operation shall be used to fill the void from stump grinding and graded to surrounding level. Excess chips and debris shall be removed by the utility/contractor.

SECTION 7 - TREE TRIMMING AND PRUNING STANDARDS
The following standards are intended to minimize adverse impacts on public shade trees. All tree pruning and electrical line clearance practices shall conform to the following standards.

7.1 Pruning shall be done in such a manner as to protect current tree health with regard to future growth, development and aesthetics.

7.2 All work on trees will be performed in compliance with:

7.3 Pruning of individual branches and limbs shall involve (but are not limited to) the following practices.
   A. Pruning tools used in making pruning cuts shall be properly maintained and kept sharp.
   B. A pruning cut that removes a branch at its point of origin shall be made close to the trunk or parent limb, without cutting into the branch bark ridge or collar, or leaving a stub (see figures below).


   C. When removing a dead branch, the final cut shall be made outside the branch collar.
   D. Tree branches shall be removed in such a manner so as not to cause damage to other parts of the tree, or to other plants nearby.

7.4 Severed limbs shall be removed from the crown of the tree before leaving the tree unattended or at the end of each workday.

7.5 Pruning and trimming operations shall not remove more than 25 percent of the tree’s foliage without prior consent from the Tree Warden.

7.6 Removal of 50 percent or more of the tree’s foliage will require the tree be removed and replaced or compensated by the person or entity responsible.

7.7 Topping trees shall require written approval from the Tree Warden prior to the pruning or trimming operations. Trees that require topping for utility line clearance shall be identified by species, size (DBH), road, and pole sections.

7.8 No limb or branch with a diameter greater than 4 inches where the branch meets the trunk or another leader shall be removed unless approved by the Tree Warden prior to the start of the pruning.

7.9 Climbing spurs shall not be used when pruning or trimming any public shade tree.

7.10 Trimming or pruning of public shade trees shall include removal of hazardous branches (hangers) and deadwood over 3 inches in diameter.

7.11 Trimming for utility wire clearance shall protect the viability and proper shape of the tree being trimmed where possible.

Adopted by Board of Selectmen – April 1, 2004
7.12 Tree to wire trimming distances for clearance of the electrical conductors shall be approved, in writing by the Tree Warden.

SECTION 8 - TREE PLANTING
Public street and shade trees removed or damaged beyond repair shall be replaced (or compensated for) by the person or entity who removed or damaged the tree. The following specifications apply to any replacement street, or shade tree planted along public right of ways or on Town-owned property.

8.1 The person or entity responsible for planting the tree shall furnish all plants and planting materials required for properly installing replacement shade and street trees.

8.2 Plant material shall conform to the requirements described in the latest edition of the American Association of Nurserymen's American Standard for Nursery Stock.

8.3 Selected plant material must be approved, on site, by the Tree Warden. Upon inspection, the Tree Warden can refuse the installation of any plant if that plant does not meet the following plant material guidelines.
   A. Shade trees shall be a minimum of 2 - 2.5 inch caliper (trunk diameter measured 6 inches from ground level).
   B. All plant material will be free of deadwood, damage to the bark, limbs or root ball.
   C. All trees shall have a single trunk and one dominant (main) leader unless specified otherwise by the Tree Warden.
   D. The root collar of tree shall be visible and at the same level as the top of the root ball (balled and burlapped trees only).
   E. Live, undamaged limbs and branches shall not be pruned prior to planting unless approved by the Tree Warden.

8.4 Proposed planting locations shall be presented, in writing to the Tree Warden at least sixty (60) calendar days prior to scheduled planting.

8.5 Notification of underground utility location services (1-888-DIGSAFE) are the responsibility of the person or entity performing the planting.

8.6 The planting hole and planting methods shall conform to the following specifications unless specified otherwise by the Tree Warden.
   A. The depth of the hole shall be no deeper than the depth of the root ball.
   B. The hole size should be approximately three times the width of the ball and have sloped sides (see diagram below).

Planting Diagram
From: *The University of Massachusetts Extension Service - Fact Sheets: Plant Culture and Maintenance - Planting and Maintaining Trees and Shrubs*

C. The trunk flare is 1 to 2 inches above the existing grade at the time of planting.

D. All rope, twine, burlap and wire from the basket shall be removed to a depth of 8 to 12 inches.

E. Burlap and twine shall be made from organic material that will readily decompose in the soil. Presence of plastic rope, twine or plastic simulated burlap will result in rejection of the plant at the person or entity's expense.

F. The root ball shall remain intact throughout the planting process.

G. Back fill shall consist of material primarily from the planting hole. Soil amendments or additional back fill shall be approved or required by the Tree Warden if the existing soil is unsuitable for plant growth.

H. All newly planted trees shall be staked unless directed otherwise by the Tree Warden.

I. Staking material (if required) shall be approved prior to planting by the Tree Warden.

J. Stakes shall be maintained throughout the guarantee period and removed by the person or entity or property owner at the end of the guarantee period unless directed otherwise by the Tree Warden.

K. Once back filled, all planting areas shall be covered with 2 to 4 inches of bark mulch and watered again.

8.7 All plant material shall be guaranteed and maintained for appearance, health and vigor by the person or entity responsible for planting the tree for a period of 2 years. This may include watering, fertilizing, weeding, straightening, replacement of stakes or any other action needed to promote the health, vigor and appearance of the plant.

8.8 At the end of the guarantee period, the Tree Warden (or designee) will inspect the plant for health, vigor and appearance. The plant should have at least 75 percent new growth, be structurally sound and have an appearance consistent with other trees of that species and size.

8.9 Trees and plants that fail the 2-year inspection shall be removed and replaced by the person or entity who planted the tree, and guaranteed for an additional 2 years.

**SECTION 9 - ROOT ZONE EXCAVATION**

When excavating in the proximity of public street and shade trees, all efforts must be made to protect the root zone and above ground parts of the tree whenever possible.

9.1 Pre-excavation procedures

A. The Tree Warden must be notified when excavation of roadways, sidewalks, lawn areas or natural areas will come within the critical root zone (CRZ) of any public street or shade tree (see CRZ definition in Section 4).

B. Plans for excavating in the proximity of public street and shade trees must be presented to the Tree Warden a minimum of sixty (60) calendar days before excavation is scheduled. At this time, protection measures and alternate plans can be discussed.

C. The CRZ of public shade trees may be extended or reduce only by the Tree Warden.

9.2 Excavation in proximity of public street and shade trees

A. A certified arborist must be onsite to monitor all excavation with the CRZ as specified by the Tree Warden.

B. Cutting of any roots on newly planted trees or trees less than 10 inches DBH will be approved at the discretion of the Tree Warden.

9.3 Cutting of roots

*Adopted by Board of Selectmen – April 1, 2004*
A. Roots over 4 inches diameter, on mature trees, shall not be cut without the prior, written consent of the Tree Warden or by the certified on site arborist with the written consent of the Tree Warden.

B. Roots under 4 inches diameter on mature trees may be cut at discretion of the onsite arborist.

C. All roots that must be cut shall be severed by using a sharp handsaw, electric reciprocating saw (Sawsall) or hand pruners. Exposed roots shall be covered with fill at the end of each workday.

D. Severed roots shall be watered prior to being covered with backfill or other material suitable for preventing the drying out of the remaining roots. No roots (or excavated area) shall be left open and exposed over night. Once back-filled, the excavated area shall be watered.

E. All trees with severed roots will be watered sufficiently to saturate the CRZ. Once back-filled with soil, 2 to 4 inches of wood chip mulch shall be installed over the impacted area (where practical) to retain moisture and prevent further soil disturbance.

F. At the discretion of the Tree Warden, trees with severed roots may be subject to further treatments and maintenance, at no cost to the Town, to mitigate problems associated with root loss. These may include but are not limited to the following:
   1) Deep root liquid fertilizing
   2) Continued watering
   3) Pruning
   4) Health monitoring program by a certified arborist

9.4 Damage to public street and shade trees from excavation

If substantial damage has been done to a public shade or street tree which may lead to the death of said tree, or become a public safety concern, the Town may remove or have removed the tree, and require compensation or replacement of the tree at the expense of the person or entity responsible for damaging the tree.

SECTION 10 - SUSPENSION OF PERMIT AND OR VIOLATION OF CONDITIONS

10.1 Any violation of these conditions will result in the permit being revoked and the issuing of a stop work order. The Tree Warden may cancel a permit or issue a stop work order without notice.

10.2 Nothing contained in these Regulations shall prohibit the Tree Warden from refusing to permit the removal of non-hazardous trees.

10.3 The Tree Warden may refuse to grant a permit for the removal of a non-hazardous tree if, in his/her opinion, the tree is of historical or scenic value, is of a size or species not commonly found along roadways of Sandwich, has significant wildlife value, or is an unusually healthy or significant specimen.

10.4 In addition to revocation of a permit as provided for above in Subsection 10.1, the Tree Warden, in his discretion may invoke any and all of the following non-exclusive penalties for violating any provision of these Regulations:

A. "These regulations may be enforced by non-criminal disposition under M.G.L. c.40, §21D and the Town's General Bylaws, §2.80. For the purposes of such non-criminal disposition, the enforcing persons shall be the Tree Warden, the Board of Selectmen, and the Town's police officer. The penalty shall be $300, with each act that causes damage to a separate tree constituting a separate offense."

B. These penalties are provided for in M.G.L., c. 87 §2,6,11,12, and in M.G.L., c.242 §7 and penalties under M.G.L., c.40 §21D.

10.5 All decisions by the Tree Warden may be appealed to the Board of Selectmen.

Adopted by Board of Selectmen – April 1, 2004
SECTION 11 - SEVERABILITY
If any provision of these Regulations are determined to be invalid or unenforceable, such determination shall not effect the validity or enforceability of any other provision.