

City of Longmont
Forestry Standards and Specifications

Effective 1/1/2014



Forestry Services

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Section A: License Requirements

License Required

A 'Tree Contractor License' issued by the City of Longmont is required for all companies that perform work on trees located within the city limits. This includes all public and private trees. Tree work that requires a license includes the following activities:

- ✓ Cutting, trimming, pruning or removing of trees.

The following businesses that provide only this specialized type of service are exempt from needing to obtain a license:

- ✓ Stump grinding, tree planting, application of pesticides.
- ✓ Businesses that apply pesticides to trees within City limits must have a current commercial applicator license from the Colorado Department of Agriculture.

A license waiver may be requested for a specific tree removal operation or project:

- ✓ Example: site demolition by a qualified demolition company.

Chapter 6.88 of the Longmont Municipal Code establishes the requirements for a Tree Contractor License.

Applicants must meet the following criteria to be licensed:

1) Obtain and maintain a minimum of one of the following International Society of Arboriculture (ISA) Certifications:

- Certified Tree Worker Climber Specialist
- Certified Tree Worker Aerial Lift Specialist
- Certified Arborist Utility Specialist
- Certified Arborist
- Board Certified Master Arborist

2) Complete an aerial tree pruning practical field test by achieving a passing score administered by the City of Longmont. City staff will provide ground person for exam & clean up debris generated from pruning test.

3) All motor vehicles must clearly display the licensee's business name. Signage letters and numbers shall be a minimum size of two (2) inches in height and visible from a distance of 60 feet.

4) Each licensee must carry commercial liability insurance covering all of the applicant's proposed tree service operations. The insurance must be at a minimum amount of \$1,000,000 (one-million dollars) per occurrence. Workers compensation insurance shall be utilized if applicable.

Section B: Applicability of Standards

City of Longmont employees and companies holding a Tree Contractor License issued by the City shall perform all pruning and removal of trees on public or private property within the City in accordance with these Standards & Specifications, Best Management Practices, Chapters 6.88 and 13.24 of the Longmont Municipal Code. Any licensee not complying with these requirements may result in having their Tree Contractor License suspended or revoked.

Section C: Best Management Practices

These documents are published by and available from the ISA. The most recent editions of these Best Management Practices shall be used.

- Best Management Practices/Tree Pruning
- Best Management Practices/Utility Pruning of Trees
- Best Management Practices/Tree Support Systems
- Best Management Practices/Tree Lightning Protection Systems
- Best Management Practices/Tree Planting
- Best management Practices/ Integrated Pest Management
- Best Management Practices/Managing Trees During Construction
- Best Management Practices/Tree and Shrub Fertilization.

City of Longmont employees, companies holding a Tree Contractor license or any other business or individual shall perform all work on or around trees in accordance with the Best Management Practices unless otherwise approved by the Forestry Services.

Section D: Pruning & Removal Standards

These standards were adapted in part from ANSI A300 (Part 1) – 2008 Pruning, ISA Best Management Practices/Tree Pruning and Best Management Practices/Utility Pruning of Trees.

Contractors holding a Tree Contractor License shall be familiar with and utilize in business practice the following literature (most recent edition) regarding tree pruning and removals.

- City of Longmont Standards and Specifications
- Chapter 6.88 and 13.24 of the Longmont Municipal Code
- ANSI Z133.1 Safety Requirements for Arboricultural Operations
- ANSI A300 (Part1) – Pruning
- ANSI A300 (Part 3) – Support Systems Standard
- ANSI A300 (Part 9) – Tree Risk Assessment Standard
- ISA Best Management Practices – Tree Pruning
- ISA Best Management Practices – Utility Pruning of Trees

- ISA Best Management Practices – Tree Risk Assessment
- ISA Best Management Practices – Tree Support Systems: Cabling, Bracing and Guying
- ISA’s Tree Climber’s Guide (Lilly and Kotwica)

Pruning recommendations and actual pruning work shall always regard tree health and the tree’s structural integrity. Specifications for pruning and removal work should be based on objectives, describe the major job components, explain work method (type) and include location of tree(s) on the property. All specifications shall be written. Written specifications for pruning or removal should be administered by an arborist.

The following information shall be specified in writing prior to the commencement of tree pruning:

- Pruning objectives shall be established.
- Pruning method (type) – clean, thin, raise, reduce, structure or restore shall be specified.
- Pruning method - the location and minimum size of parts to be removed shall be specified.
- Exceptions for making an internodal heading cut shall be specified prior to commencement of work.

1) General Pruning and Removal Standards:

- a) Pruning and removal cuts shall be performed by an arborist or arborist trainee under the direct supervision of an arborist. These are generic titles based on competency and experience, but they need not be the actual position titles. The arborist does not need to be on site at all times, but shall be familiar with the practices and hazards of the tree work assigned and the equipment used in such operations. Ground work does not need to be performed by an arborist or arborist trainee.
- b) In conducting tree pruning or removal operations, all work shall be performed using methods and equipment in such a manner so as to avoid and prevent damage to other plants (except minor damage to turf), properties, structures or persons.
- c) Tree pruning and removal operations shall comply with all federal, state and local laws and regulations.
- d) Off-site trees shall not be cut or pruned beyond a property line without prior verbal or written approval from the owner(s) of the tree(s), or his/her authorized representative. An exception is that the City can authorize pruning or removal of trees or shrubs posing a hazard to public property or for the control of tree diseases or insect infestations as described in Chapter 13.24 of the Longmont Municipal Code.

- e) During an emergency, tree work often needs to be performed as quickly as possible. At such times, because of safety and the urgency of the operation, it may be necessary to deviate from the use of proper pruning techniques as defined in this standard. Following the emergency, corrective pruning should be done as necessary.
- f) Licensed contractors or their representatives should attend informational meetings scheduled by Forestry Services.
- g) Any licensed Tree Contractor shall stop work on a job site when directed by the City for possible violations of a safety standard, tree topping or improper tree care. Work shall not resume until the violation is discussed and approved by Forestry Services. Violations of these standards may include suspension or revocation of the Tree Contractor License.
- h) Specifications for removal work shall describe where the lowest cut will be made and if stump removal will be included.

2) Tree Inspection Prior to Pruning or Removal:

- a) An arborist shall visually inspect each tree before beginning pruning or removal operations.
- b) If a condition is observed requiring attention beyond the original scope of work, the condition should be reported to an immediate supervisor, the owner, customer/client or the person responsible for authorizing the work.

3) Pruning Tools and Equipment:

- a) Equipment, tools, and work practices that damage living tissue and bark beyond the scope of normal work practices shall be avoided.
- b) Climbing spurs shall not be used when entering and climbing trees for the purpose of pruning, tree inspection, or any purposes other than removal. An exception will be made for aerial rescue operations.

4) Pruning Cuts:

- a) Pruning tools used in making pruning cuts shall be sharp.
- b) A pruning cut that removes a branch at its point of origin (removal cut) shall be made close to the trunk, or parent branch, without leaving a stub or without cutting into the branch bark ridge or branch collar.

- c) A pruning cut that reduces the length of a branch or parent stem by cutting back to another branch or stem (a reduction cut or heading cut to a lateral) shall be made at a slight downward angle relative to the remaining stem without damaging the remaining stem.
- d) When pruning to a lateral (reduction cut), the remaining lateral branch should be large enough to assume the terminal role. A reduction cut removes a stem or branch back to a lateral branch or stem that is large enough to assume the terminal role. This lateral branch should be at least one-third the diameter of the removed portion. A larger ratio closer to one-half is usually preferred. If the lateral branch that remains is less than one-third the diameter of the removed stem (both stems measured perpendicular to their main branch axis at the branch junction), then the cut is considered a heading cut to a lateral. A heading cut to a lateral is considered inappropriate on most trees. A reduction cut may lead to decay behind the cut. The extent of decay depends on the diameter of the cut and the tree species. Large-diameter cuts (greater than about 2 – 3 inches) are likely to lead to more decay than small cuts.
- e) Heading cuts to a lateral that are less than the one-third rule, shall only occur when the objective for pruning cannot be achieved with pruning cuts that cause less impact to the tree's health or structural integrity. For example, to reduce risk of failure, provide clearance, improve view, etc. where there is not a way to prune so as to cause less impact to the tree's health or structural integrity and still meet the objective(s). Topping is an inappropriate technique in meeting an objective. Heading cuts to a lateral can cause significant problems and shall be used with a great deal of discretion. Heading cuts to a lateral can cause starvation due to the reduction of total leaf area and may result in irreversible decline of a tree or main branch. Heading cuts to a lateral can also cause a large wound that may allow decay to develop in a way that will negatively impact the structural integrity of the remaining lateral branches or sprouts that occur around the cut. Pruning recommendations and actual pruning work shall always regard the health and structural integrity of the tree.
- f) The final pruning cut should result in a flat surface with adjacent bark firmly attached.
- g) When removing a dead branch, the final cut shall be made just outside the collar of living tissue.
- h) Tree branches shall be removed in such a manner so as to avoid damage to other parts of the tree or to other plants or property. Minor damage to turf is often unavoidable and will be an exception. Branches too large to support with one hand shall be pre-cut using an acceptable three-cut method or rigging to avoid splitting of the wood or tearing the bark. Multiple cutting techniques exist for application of a three-cut method.
- i) A cut that removes a branch with a narrow angle of attachment should be made in a way that it will not cause damage to the parent branch or stem.

- j) Severed branches or hangers shall be removed from the crown upon completion of the pruning, any time that tree is left unattended, or at the end of the workday.
- k) Heading cuts in the intermodal zone shall not be made on a branch, or a stem, two years old or older except for the following reasons:
- On a mature tree, a large branch or stem stub may be left to slow the movement of decay into a major branch or main stem. The exception and the reason shall be included in the specifications.
 - On a mature tree, a large branch or stem stub may be left for wildlife considerations. The exception and the reason shall be included in the specifications.
 - When shearing a tree to an unnatural shape, cuts may be made in two year old wood but not in wood three years old or older.
 - Pruning required for clearance of a street, sidewalk or other defined pedestrian or vehicle passageway may include shearing or cutting back into wood three years old or older. Minimum clearance over a city street is 15 feet. Minimum clearance over a sidewalk is 8 feet. Tree health shall be considered and therefore no more than 25% of the crown of a tree shall be pruned at one time.
 - After a risk assessment conducted by an arborist has determined that the cut should be made to reduce risk. This situation could occur where access is not available, or permission to enter a property is not obtained from property owner, to make a more preferable cut. The exception and the reason shall be included in the specifications.
 - Pollarding is a specialty pruning technique in which vertical growth of limbs is restricted. Starting on a young tree, intermodal cuts are made at a chosen height, resulting in the development of callus knobs at the cut height. This requires regular (usually annual) removal of the sprouts arising from the cuts. The exception and the reason shall be included in the specifications.

5) Wound Treatment:

- a) Wound dressings should not be used to cover wounds or pruning cuts, except when necessary for disease, insect, mistletoe or sprout control.
- b) Wound treatments that are damaging to tree tissues shall not be used.
- c) When tracing wounds, only loose, damaged tissue shall be removed.

6) Pruning Objectives:

- a) Pruning objectives shall be established prior to beginning any pruning operation.
- b) Objectives should include, but are not limited to, any of the following:
 - Reduce risk of failure
 - Provide clearance
 - Reduce shade
 - Reduce wind resistance
 - Maintain health
 - Influence flower or fruit production
 - Improve a view
 - Improve aesthetics

7) Pruning Method (Type):

Pruning type shall be specified prior to commencement of work.

- a) **Crown Clean:** Shall consist of pruning to remove one or more of the following non-beneficial parts: dead, diseased and/or broken branches.
 - Location and minimum size of parts to be removed shall be specified prior to commencement of work.
- b) **Crown Thin:** Shall consist of selective removal of live branches to reduce crown density. This pruning type includes crown clean as defined above.
 - Thinning should result in an even distribution of live branches on individual branches and throughout the crown.
 - Lion tailing is a poor pruning practice and shall not occur when pruning live branches during thinning.
 - Not more than 25 percent of the live crown should be removed within an annual growing season.
 - Location of parts to be removed shall be specified prior to commencement of work.

- c) **Crown Raise:** Shall consist of selective removal of branches to provide vertical clearance. Crown raising should shorten or remove lower branches to provide clearance for buildings, signs, vehicles, pedestrians, vistas or other considerations.
- Live crown ratio should not be reduced to less than 50 percent.
 - Location and size range of parts to be removed should be specified prior to commencement of work.
- d) **Crown Reduction:** Shall consist of pruning branches or stems to decrease the height and/or spread of a tree. This type of pruning is done to minimize risk of failure, to reduce height or spread, for utility line clearance, or to clear vegetation from buildings or other structures.
- Certain species do not respond well to crown reductions. Therefore, not all trees can be reduced. Species and plant health shall be considered prior to commencement of work. Not more than 25 percent of the crown should be removed.
 - The tree's form, branch structure, health and structural integrity shall be considered in determining the appropriate amount of reduction to meet the objective.
 - Topping or heading shall not be used as a pruning technique to reduce tree size by cutting back a tree to a predetermined crown limit.
 - When a limb on a mature tree is cut back to a lateral, no more than one-fourth of its foliage should be removed.
 - Location of parts to be removed or clearance requirements shall be specified prior to commencement of work.
- e) **Structure Pruning:** Shall consist of selective pruning to improve tree and branch architecture primarily on young and medium aged trees.
- Central leader should be selected for development as appropriate.
 - Strong, properly spaced scaffold branch structure should be selected for and maintained by reducing or removing other branches.
 - Temporary branches should be retained or reduced as appropriate.
 - Interfering, overextended, defective, weak and/or poorly attached branches should be removed or reduced.

- Size and location of leaders or branches to be subordinated or removed should be specified prior to commencement of work.
- f) **Crown Restoration:** Shall consist of selective pruning to redevelop structure, form and appearance of severely pruned, vandalized or otherwise damaged trees.
- Location in tree, size range of parts, and percentage of sprouts to be removed should be specified prior to commencement of work.

8) Utility Pruning:

The purpose of utility pruning is to prevent the loss of service, comply with mandated clearance laws, prevent damage to equipment, maintain access, and uphold the intended usage of the facility while adhering to accepted tree care performance standards.

- a) Companies performing utility pruning are required to be licensed by the City of Longmont.
- b) Pruning cuts shall be made in accordance with sub-section "Pruning Cuts" of this document.
- c) A minimum number of pruning cuts should be made to accomplish the purpose of utility pruning. The structure and growth habit of the tree shall be considered prior to commencement of work.
- d) Utility pruning should be accomplished by removing entire branches. Branches that, when cut, will produce vigorous sprouts that would grow into facilities and/or utility space should be removed.
- e) Branches shall be cut to laterals or parent branch and not at a pre-established clearing limit. If clearance limits are established, pruning cuts shall be made at laterals or parent branches outside the specified clearance zone. Topping is an inappropriate technique in meeting this objective.
- f) A tree interfering with a utility space should be pruned by reducing branches to laterals to direct growth away from the utility space or by removing entire branch. Branches when cut may produce vigorous sprouts that would grow into facilities and/or utility space should be removed.
- g) During a utility-declared emergency, service must be restored as quickly as possible. At such times it may be necessary, because of safety and the urgency of service restoration, to deviate from the use of proper pruning techniques. Following the emergency, corrective pruning should be done as necessary.

- h) Only a qualified line-clearance arborist or line-clearance arborist trainee shall be assigned to line clearance work in accordance with industry requirements and regulations.
- i) To be compliant with the OSHA 29 CFR 1910.268, 269, 331, 333 and ANSI Z133.1, only utility pruning contractors with qualified employees shall perform any activity that may bring an individual or equipment within ten (10) feet of high voltage (600 volts or greater) overhead lines. Contractors working directly for the utility shall be considered qualified. Non-qualified employees or individuals must contact the appropriate utility to make arrangements for safe activity.
- j) When an arborist is unable to safely maintain their applicable minimum approach distance (non-utility qualified is ten (10) feet, for utility qualified see OSHA/ANSI guidelines for specific voltages) or the work may not be done safely with the conductor energized, the arborist must stop work operations until an electrical hazard abatement plan is implemented.

Section E: Safety Standards

These standards were compiled and adapted in part from ANSI Z133-2012. Contractors holding a Longmont Tree Contractor License shall be familiar with and utilize in business practice the following literature regarding safety standards in arboriculture:

- City of Longmont Forestry Standards and Specifications
- Chapter 6.88 and 13.24 of the Longmont Municipal Code
- ANSI Z133.1-2012: Safety Requirements for Arboricultural Operations
- ANSI/ISEA Z87.1-2010: American National Standard for Occupational and Educational Personal Eye and Face Protection Devices
- ANSI/ISEA Z89.1-2009: American National Standard for Industrial Head Protection
- ANSI/SIA A92.2-2009: American National Standard for Vehicle-Mounted Elevating and Rotating Aerial Devices
- ANSI/ISEA 107-2010: American National Standard for High-Visibility Safety Apparel
- Manual on Uniform Traffic Control Devices – MUTCD <http://mutcd.fhwa.dot.gov/>
- Arborist Equipment: A Guide to the Tools & Equipment of Tree Maintenance & Removal – Donald Blair
- The Art and Science of Practical Rigging - Peter Donzelli & Sharon Lilly
- Evaluating Tree Defects: 2nd Edition – Ed Hayes
- Chain Saw Safety and Field Maintenance - Kevin Eckert
- ISA's Tree Climber's Guide - Sharon Lilly & Bryan Kotwica

1) General Safety Standards:

- a) All workers present on-site shall wear appropriate Personal Protective Equipment (PPE) including head protection (helmets), eye protection, hearing protection, ankle high boots, long pants and a shirt.
- b) Chainsaw protective leg coverings (chaps or chainsaw protective pants) shall be worn when operating a chainsaw on the ground.
- c) A work zone must be established and properly marked with signage, flagging or cones when there is a possibility that non-workers could enter unknowingly. Non-workers or non-essential personnel should not enter a work zone.
- d) Do not chip brush while wearing loose clothing, climbing equipment, harnesses, lanyards or gauntlet-style gloves because of a higher chance of becoming caught up by material being pulled into the chipper.
- e) A visual inspection of the tree, trunk flare, and root zone shall be completed and potential hazards shall be identified before the arborist climbs or performs any work on the tree.
- f) A second arborist, arborist trainee or ground worker trained in emergency protocol shall be within sight and/or oral communication range during aerial operations above 12 feet.
- g) While engaged in aerial climbing operations and/or ascending a tree (including using spurs/spikes) an arborist shall have available an appropriate length climbing line. Additionally, the arborist shall be secured (tied-in) by at least one means (climbing line or work-positioning lanyard) throughout the ascent.
- h) When using a ladder to gain aerial access to a tree, an arborist shall not work from or step-off the ladder onto the tree until they are tied-in or secured.
- i) Aerial lifts shall be equipped with a fall protection anchor to secure a personal fall protection device (full body harness with energy-absorbing lanyard or regular harness with lanyard) which shall be worn by the arborist aloft at all times. These required pieces of PPE must meet the ANSI/SIA A92.2 Standard.
- j) Chainsaw safety components (chain brake, throttle interlock, chain catcher) shall not be removed or modified. A chainsaw shall not be operated if the safety components are not in working order.

- k) Arborists working aloft in a tree shall be tied-in and secured by a second means (work-positioning lanyard or second climbing line) when operating a chainsaw. Using two lanyards or both ends of a two-in-one lanyard shall not be considered acceptable as two means of securement when operating a chainsaw aloft.
- l) Two hands shall be used at all times when operating a chainsaw unless the arborist is placed in danger or a significant hazard is presented by operating the saw with two hands.
- m) Workers having roles and responsibilities with a temporary traffic control plan shall be trained in traffic control techniques, sign usage/placement, and how to perform work near traffic while mitigating their risk/exposure to injury.
- n) Workers exposed to the risks of traffic shall wear high-visibility safety gear meeting the standards of ANSI/ISEA 107.
- o) Traffic flow should be restricted as minimally as possible while moving through a temporary traffic control area. Workers shall use necessary signage and devices to provide clear signals to drivers in accordance with MUTCD.
- p) A working in the Right of Way permit can be obtained from City of Longmont Engineering Services, (303) 651-8757. Appropriate traffic plans are required when impacting defined pedestrian or vehicle passageway. A permit fee is required when obtaining a permit.
- q) According to OSHA's Hazard Communication Standard employees have both a need and a right to know the hazards they are exposed to when working. They also need to know what protective measures are available to prevent injury or accidents from occurring.
- r) Longmont Power & Communication will provide various levels of service to aid in the maintenance of trees near electrical conductors. To request a temporary shut off for maintenance pruning, a safety-zone pruning operation, or covering of the lines for safety call Longmont Power & Communications during regular business hours at (303) 651-8386.

2) Sight Distance Triangle:

In order to preserve sight distance and the safety of pedestrians and vehicles, an unobstructed area shall be maintained with the following sight distance triangular areas.

a) Intersection Obstruction Free Areas

These areas shall be free from trees, shrubs and other plants greater than three (3) feet in height, when measured from the grade of the roadway, which would block the intersection sight distance.

- At the intersection of any two streets, or where a street intersects with an alley: A triangle measuring thirty (30) feet along each curb or edge of roadway from their point of intersection, the third side being a diagonal line connecting the first two. The City may require a greater distance in certain high volume or high speed traffic intersections.
- At the intersection of a private access point and street: A triangle measuring fifteen (15) feet in length along the edge of the driveway and along the curb or edge of roadway from their point of intersection, the third side being a diagonal line connecting the first two (2).

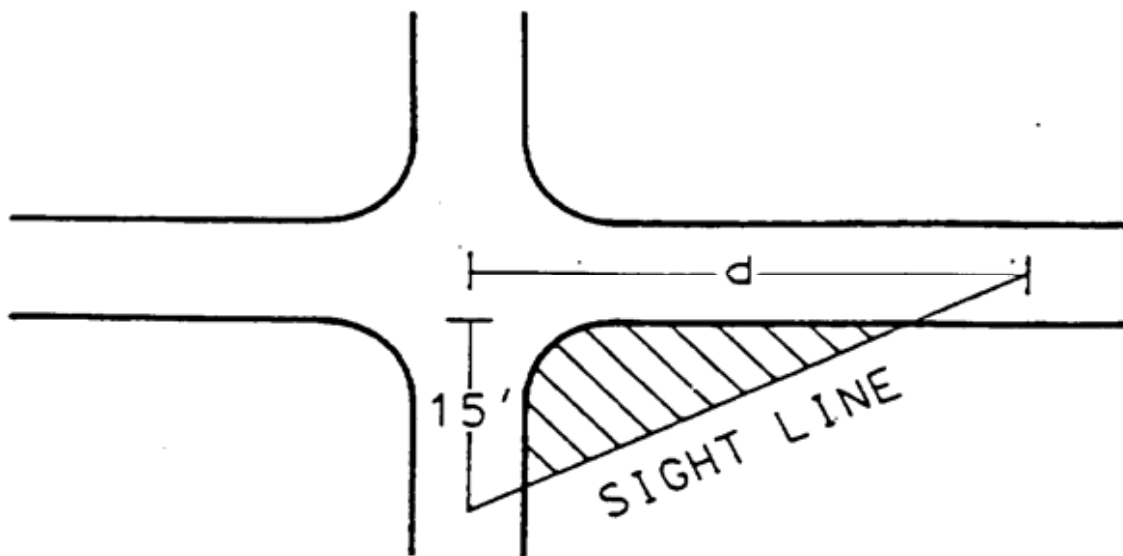
b) Additional Intersection Sight Distance Criteria

For situations where specific safety concerns exist, or on higher speed or volume streets, the City will require additional sight distance review, and an increase in the obstruction free areas outlined above. The criteria used will be as follows.

- Intersection sight distance shall be measured at a height of three and one half (3½) feet for the entering vehicle to a height of four and one quarter (4¼) feet for the oncoming vehicle. The entering driver's eyes shall be assumed to be at a point fifteen (15) feet back from the edge of the traveled way.

The following table and figure shall be used to determine the area necessary for intersection sight distance. That area shall be free from shrubs, ground covers, berms, fences, signs, structures, parking, or other material or items greater than three (3.0) feet in height, when measured from the grade of the roadway, which would block the intersection sight distance.

TRAFFIC SPEED MPH	INTERSECTION SIGHT (d - feet) 2-LANE THROUGH	INTERSECTION SIGHT (d - feet) 4-LANE THROUGH
20	200	240
25	250	300
30	300	360
35	350	420
40	400	480
45	450	540
50	500	600
55	550	660



Section F: Insect and Disease Standards

These standards were compiled and adapted in part from United States Department of Agriculture/Animal and Plant Health Inspection Service (USDA/APHIS), Colorado State University (CSU) Cooperative Extension, Ohio State University (OSU) Extension, ISA BMP's - Integrated Pest Management (IPM). ISA Trees are Good – Insect and Disease (I&D) Problems.

1) General Insect & Disease Standards:

Contractors holding a Longmont Tree Contractor License shall be familiar with and utilize in business practice the following literature regarding insect and disease issues:

- City of Longmont Standards and Specifications
- Chapter 13.24 of the City of Longmont Municipal Code
- Best Management Practices/IPM (ISA)
- Dutch Elm Disease - OSU Extension
- Mountain Pine Beetle - CSU Cooperative Extension
- Spruce IPS Beetle - CSU Cooperative Extension
- Thousand Canker Disease - CSU Cooperative Extension
- Emerald Ash Borer - CSU Cooperative Extension
- Insects and Diseases of Woody Plants of the Central Rockies – CSU Cooperative Extension

Correct identification and assessment of Insect & Disease (I&D) issues shall be performed by an ISA Certified Arborist, Board Certified Master Arborist, Consulting Arborist, CSU Extension representative, or an academically accredited plant health care professional.

The goal of IPM is to manage I&D and their damage to tolerable levels. IPM focuses on pest prevention and suppression rather than eradication. However, when dealing with a highly damaging I&D issue, eradication may be the desired goal. IPM shall promote tree appearance, structure, and vitality; void harmful effects on non-target organisms; and cause minimal disturbance to the built/natural environment.

Steps taken in I&D/IPM processes shall begin with prevention, followed by necessary action, continuing with maintenance and proper disposal of material.

- a) Prevention will consist of reducing stressing factors to trees through regular maintenance, care and watering.
- b) Necessary actions shall be taken if insects and/or diseases are present beyond tolerable levels. Those actions can include pruning, removal, or treatment.

- c) When pruning or removing diseased or infested material proper material disposal protocol must be followed.
- d) Handling and disposal of disease or infested material shall comply with all federal, state and local laws and regulations.
- e) Public education is an important component regarding local I&D issues and updates. Forestry Services shall be kept informed about I&D issues that are threatening the City's urban forest.

2) City of Longmont Wood Holding Yard:

- a) To help prevent the spread of communicable I&D concerns, a wood holding yard is available for contaminated wood. Only infested wood for EAB, TCD, IPS, MPB, or DED will be accepted.
- b) Arrangements must be made with Forestry Services staff previous to dumping of wood at this site. No admittance shall be allowed without Forestry staff present. Holding yard area is gated and locked.
- c) Wood must be 12 inches or greater in diameter, logs must be no longer than 10 feet in length.

3) Urban Wood Utilization Centers:

- T.C. Woods – 5406 CR 23 Fort Lupton, CO 80521
Dan Odell (303)666-8989 contact@tcwoods.com
- Baldwin Hardwoods – 1200 Round Butte Rd, Fort Collins, CO 80524
Ryan Baldwin (970)219-6887 ryan@baldwinwoodworking.com
- Singing Saw Woodworks – 11218 HWY 93 Boulder, CO 80303
John Hubert (303)588-0349 jonsingingsaw@aol.com

4) Insect & Disease threats to Longmont Urban Forest:

- a) **Dutch Elm Disease** (fungus: *Ophiostoma* species – beetles: *Scolytus multistriatus* & *Scolytus schevyrewi*) – Disease primarily affects American Elm trees. Disease is vectored by the European Elm Bark Beetle and the Banded Elm Bark Beetle. Yellowing and flagging of leaves on upper branches are usually the first symptoms. As the disease

progresses the entire crown may become symptomatic. Pruning shall be done during dormancy (after leaf drop and before bud break). All infected material shall be chipped and disposed of away from site of origin and other elm trees to avoid other potential infestations. Wood shall be disposed of at City Forestry Holding Yard, buried at a local landfill, or bought to an Urban Wood Utilization Center that adheres to industry standards and BMP's.

b) **Emerald Ash Borer** (*Agrilus plannipennis*) – Emerald Ash Borer has been discovered in the City of Boulder. Colorado Department of Agriculture (CDA) has established a quarantine zone around Boulder County, the entire City of Erie, the two Erie landfills and the Republic landfill off highway 93 in Jefferson County. The quarantine will be effective by November 12, 2013. Quarantine restrictions include movement of Ash (*Fraxinus* species) from the quarantine area ONLY with proper treatment and under compliance agreement with CDA/APHIS. Proper treatment includes:

- Chipping to 1 inch by 1 inch in two dimensions (best option)
- Heat treatment
- Composting
- Fumigation
- Lumber – remove all bark and ½ inch of wood
- Ash Nursery Stock in the quarantine area may not be sold to anyone outside the quarantined area. There is no treatment or certification of Ash nursery stock.

ALL Hardwood firewood must be heat treated and certified in order to move from the quarantined area. If different species of wood trimmings, chips, etc. are co-mingled, then it is all considered under restriction. Wood debris may be taken to a landfill within the quarantine area, CDA is working with Boulder County officials to identify potential marshaling areas where wood debris may be collected and treated for movement and use outside the quarantine area. Contact the Colorado Department of Agriculture at 303-239-4152 if your company needs to move or store Ash debris.

Colorado State University will be developing treatment recommendations appropriate for the Front Range and Colorado. Prior to treatment the following should be considered. Proximity to known infestations – property owners should consider treatment of desirable ash when within 5 miles of a confirmed EAB infestation (30th and Iris in Boulder). Follow all pesticide label directions correctly. Health of tree - if there is less than 30 -40% canopy dieback treatment may be effective, if there is more than 30 - 40% canopy dieback treatment is likely to be ineffective. Age, health, vigor, size and location of the ash tree should be taken into consideration to be a candidate for

treatment. Over mature and declining trees are not the best candidates for treatment. Tree benefits to the public and property owner - trees that provide significant environmental, social or economic value are candidates for treatment.

- c) **Mountain Pine Beetle** (*Dendroctonus ponderosae*) - This species primarily affects Scotch Pines, Mugo Pines, & Ponderosa Pines in urban areas. Popcorn-shaped masses of resin, called “pitch tubes,” may be evident on the trunk where beetle tunneling begins. Pitch tubes may be brown, pink or white. Avoid pruning from May to August. All material shall be chipped and disposed of away from site of origin and other pine trees to avoid other potential infestations. Wood shall be disposed of at City Forestry Wood Holding Yard, buried at a local landfill, or brought to an Urban Wood Utilization Center that adheres to industry standards and BMP’s.
- d) **Spruce IPS Beetle** (*Ips hunteri*) - This is the common species affecting Blue Spruce in landscape settings. Upper portions of the tree are infested first and typically show signs of dieback. Avoid pruning from April to December. All material shall be chipped and disposed of away from site of origin and other spruce trees to avoid other potential infestations. Wood shall be disposed of at City Forestry Wood Holding Yard, buried at a local landfill, or brought to an Urban Wood Utilization Center that adheres to industry standards and BMP’s
- e) **Thousand Canker Disease** (fungus: *Geosmithia morbida* - beetle: *Pityophthorus juglandis*) – Disease primarily affects Black Walnut and is vectored by the Walnut Twig Beetle. Yellowing and flagging of leaves on upper branches is usually the first symptom of the disease. The presence of cankers is detected by removing the bark from symptomatic limbs. All material shall be chipped and disposed of by burying at a local landfill. Wood shall be disposed of at City Forestry Wood Holding Yard, buried at a local landfill, or brought to an Urban Wood Utilization Center that adheres to industry standards and BMP’s.

5) Pesticide Application

- a) Companies solely performing pesticide application are not required to be licensed by the City of Longmont.
- b) Pesticide applicators shall comply with all federal, state and local laws and regulations.
- c) In conducting pesticide application operations, all work shall be performed using methods and equipment in such a manner so as to avoid and prevent damage to other plants, properties, structures or persons.

- d) Applications shall comply with the most recent edition of ANSI Z133.1 Safety Requirements for Arboricultural Operations.

Section G: Tree Protection

1) General Tree Protection & Preservation Standards

- a) An applicant for a construction permit (“Working in the ROW” permit) shall protect public trees on any project or construction site where public or private improvements are proposed.
- b) An applicant for construction permit shall submit a tree protection plan incorporating proposed tree protection measures for any existing trees located on public property. Depending on the size and scope of the project an external consulting arborist may be required by the city to review the plan at applicant’s cost.
- c) The tree protection plan shall identify any potential detrimental effects to existing public trees that might result from proposed construction activities within the drip line of any existing trees. The plan shall include the species, size and location of all existing trees that are 2 inch or larger DBH. Existing trees approved to be removed or relocated shall be clearly identified on the landscaping plan. If no existing trees are present that require protection, this shall be noted on the plan.
- d) The applicant for construction permit shall notify the city within 24 hours of any suspected damage to trees resulting from construction activities. If damage occurs to public right of way trees during construction the applicant shall have the damaged tree assessed by Forestry Services. The applicant will be responsible for all costs associated with damage mitigation, restoration work and/or the appraised tree value.

2) Preventing Soil Compaction

- a) To prevent soil compaction designated routes for equipment and foot traffic by work crews shall be determined prior to commencing construction activities and indicated in the tree protection plan.
- b) These planned routes shall be marked at the site before construction commences. Durable fencing shall be used. Flagging tape or other materials that may be moved or evaded is not acceptable.

- c) The contractor shall inform all construction crew members and subcontractors of the routes and will ensure that only these routes are used.
- d) To prevent soil compaction and reduced tree root respiration; no soil stockpiles, supplies, equipment, or any other material shall be placed or stored within a tree drip line or within 10 feet of the tree trunk whichever distance is greater. Heavy objects such as wood pallets or metal railings shall not lean against or come in contact with the trunk.
- e) When foot traffic or equipment use is unavoidable within the drip line, this area shall be mulched with wood chips to a predetermined depth before construction activity begins. Mulch depth and possible planking shall be maintained for the duration of the project and removed when construction activities are completed. Situations such as this need to be discussed and approved by Forestry Services.
- f) Fencing material shall encircle any tree whose drip line edge is within 20 feet of any construction activity.

3) Tree Fencing

- a) Fencing material shall be a bright contrasting color, durable and at least 4 feet high. Fence posts shall be comparable to metal T-posts or heavier posts and placed at least 12 inches in solid ground.
- b) Fencing material shall be placed at the drip line or at least 10 feet from any tree trunk, whichever distance is greater. Fencing shall be maintained in an upright position throughout the duration of construction activities.
- c) The applicant for construction approval shall indicate fencing locations on the tree protection plan.
- d) Gates or other access shall not be allowed in tree fence areas. Crews may not take breaks or reside in the fenced in tree protection area.

4) Soil Grade Changes

- a) Grade changes, such as removing topsoil or adding fill material, shall not occur within the drip line of any existing tree. If necessary as part of project or site development, retaining walls and tree wells to maintain the existing grade within the drip line of any tree may be acceptable when constructed prior to site grading changes near the tree. A tree protection plan containing an illustrated design scheme of the tree protection improvement shall be approved by the City prior to initiating any grade changes near existing trees.

5) Tree Root Protection

- a) Tree roots shall not be cut unless cutting is unavoidable. When root cutting is unavoidable a clean sharp cut shall be made. Whenever possible a root cut shall be made back to a lateral root.
- b) Whenever possible tree roots shall be cut between late fall and bud break in the spring.
- c) Forestry Services shall be notified of any cutting of two or more roots with a diameter greater than 3 inches.
- d) Whenever possible roots shall be tunneled or bored under. Tunneling or boring may be required when open trenching would result in major root destruction.
- e) A supersonic air tool will be available for soil excavation use on public trees. Typically this tool is powered by an air compressor with the ability to operate the tool at a constant air pressure of 90 psi. Contact Forestry Services to coordinate the use of air tool and operators manual. Air compressor not provided.
- f) Power tools and large equipment shall not be used to prune roots unless it is industry standard approved root-cutting equipment used under the supervision of the City. Examples of approved tools: hand pruners, non-anvil type loppers, pruning saw, chain saw, demo saw with approved diamond bit root cutting blade.
- g) Exposed roots shall be covered immediately with soil or kept moist with wet burlap.
- h) When more than one root 2 inches or larger in diameter on any public tree is cut supplemental watering shall be provided if the tree lacks an operational irrigation system. The contractor, person performing the work or adjacent landowner shall provide the watering. If roots are cut between April and August trees may require supplemental watering once per week for at least 2 months after the root(s) are cut.
- i) Roots with fresh wounds present shall not come into contact with building materials such as concrete, cement, mortar, asphalt, pavement, chip seal, tar, or any other non-solid surfacing material. A minimum soil barrier of 2 inches shall be provided between the root wound and listed materials. When a soil barrier cannot occur, an impermeable layer of plastic shall be used as a barrier between root wounds and any materials listed above.
- j) If 4 roots greater than 4 inches in diameter are to be cut, the tree may need to be removed due to structural instability. If said roots are cut, the individual or contractor shall be responsible for the cost of the tree removal and the appraised value of the tree.

- k) Alternatives to root cutting shall be considered when excavating under the drip line of trees for root/sidewalk conflicts.
- Sidewalk grinding is a temporary measure that restores the offset or heaved portion of a sidewalk to original grade.
 - Sidewalk cutouts utilize space from the adjacent sidewalk and create a buffer zone for roots. The cutout provides a larger grow space for trees and reduces the size of the pruned roots and their proximity to the root flare.
 - Sidewalk meandering involves realigning the sidewalk's direction of travel in order to provide more growing space for trees. Sidewalk meandering may require permission from the adjacent property owner.
 - Sidewalk ramping allows existing roots to remain intact by repouring concrete over the roots to create a gradually sloped ramp. It can be used when removal of roots would compromise the stability of a tree.
 - Flexible paving materials include interlocking pavers, common brick pavers, permeable pavers and rubber bricks. Flexible paving is used in conjunction with root pruning when retention of original grade is required and when the level of the paving surface is ramped above or lowered below existing grade. The selected flexible paving material is installed over a compacted sand base.

6) Tree Protection Miscellaneous

- a) Disposing of chemicals or foreign material anywhere on site including public property is prohibited. This shall include but is not limited to: paint, stain, solvents, fuel, oil, concrete or any construction material on site, and rinse water from any receptacles tools or equipment containing chemicals.
- b) Pruning of public trees should not occur during construction activities without prior city approval. Pruning of live limbs should not be performed for a period of 2 years after construction activities are completed.
- c) Other tree preservation techniques may be utilized and recommended in the pre-construction and plan review stages of the project. These techniques utilized shall be based on BMP - Managing Trees During Construction.

Section H: Miscellaneous Standards

1) Miscellaneous Standards Regarding Human Health and Protection of Public Trees:

- a) Tree houses and swings shall not be installed in public trees.
- b) Tree attachments shall not be allowed unless approved by Forestry Services.
- c) A “Working in the Right of Way” permit can be obtained from City of Longmont Engineering Services, (303) 651-8757. Appropriate traffic plans are required when impacting a defined pedestrian or vehicle passageway.
- d) Climbing of City trees shall occur only during the following circumstances.
 - When performing approved tree maintenance
 - When installing or removing approved tree attachments or objects
 - For approved arboricultural training or competition
 - During rescue or emergency situations
 - When performing an arboricultural tree climbing test, authorized by the City
 - For approved City Recreation sponsored classes

Section I: Restricted Trees

The following tree species shall be considered a nuisance as defined in chapter 13.24.100 of the Longmont Municipal Code:

- 1) cotton-bearing cottonwood - (Populus sp.)
- 2) cotton-bearing white poplar - (Populus sp.)
- 3) female boxelder maple - (Acer Negundo)
- 4) Siberian elm - (Ulmus pumila)
- 5) Russian olive - (Elaeangus angustifolia)
- 6) Saltcedar - (Tamarix sp.)

Section J: Definitions

aerial operations – any tree maintenance operations performed with feet not firmly planted on the ground.

American National Standards Institute ANSI/ISEA 107 standard (commonly referred to as the ANSI/ISEA 107) – in the United States, industry-developed, national consensus standards for high visibility safety apparel.

American National Standards Institute A300 standard (commonly referred to as the ANSI A300) – in the United States, industry-developed, national consensus standards of practice for tree care.

American National Standards Institute A922.2 standard (commonly referred to as the ANSI A922.2) – in the United States, industry-developed, national consensus standards for vehicle-mounted elevating and rotating aerial devices.

American National Standards Institute Z87.1 standard (commonly referred to as the ANSI Z87.1) – in the United States, industry-developed, national consensus standards for specific impact resistance rating and safety design for eye protection.

American National Standards Institute Z133.1 standard (commonly referred to as the ANSI Z133.1) – in the United States, industry-developed, national consensus safety standards of practice for tree care.

apical dominance – condition in which the terminal bud inhibits the growth and development of the lateral buds on the same stem formed during the same season.

appraisal – placing a monetary value on a tree, other plant, other landscaping, including hardscape, or an entire property. (2) a report stating an opinion of appraised value.

arboriculture – practice and study of the care of trees and other wood plants in the landscape.

arborist – professional who possesses the technical competency gained through experience and related training to provide for or supervise tree pruning, tree removal or the management of trees and other woody plants in residential, commercial and public landscapes.

arborist trainee – an individual undergoing on-the-job training to obtain the experience and the competence required to provide for or supervise tree pruning, tree removal or the management of trees and other woody be attached or unattached.

bark inclusion – see included bark.

best management practices – best available, industry-recognized course of action, in consideration of the benefits and limitations, based on scientific research and current knowledge.

branch – a stem arising from a larger-stem; a subdominant stem; the pith in true branches has no connection to the parent stem.

branch bark ridge – raised strip of bark at the top of a branch union, where the growth and expansion of the trunk or parent stem and adjoining branch push the bark into a ridge.

branch collar – area where a branch joins another branch or trunk that is created by the overlapping vascular tissues from both the branch and the trunk. Typically enlarged at the base of the branch.

branch protection zone – chemically and physically modified tissue within the trunk or parent branch at the base of a smaller, subordinate branch that retards the spread of discoloration and decay from the subordinate stem into the trunk or parent branch.

cambium – thin layer(s) of meristematic cells that give rise (outward) to the phloem and (inward) to the xylem, increasing stem and root diameter.

city forester – the city forester of Longmont or a duly designated representative.

cleaning – selective pruning to remove dead, diseased, cracked, and broken branches and foreign objects.

climbing spurs – sharp devices strapped to a climber's lower legs to assist in climbing poles or trees being removed. Also called spikes, gaffs, irons, hooks or climbers.

closure – the process in a woody plant by which wound wood grows over a pruning cut or injury.

codominant stem – forked branches nearly the same diameter (diameter ratios greater than 80%), arising from a common junction and lacking a normal branch union.

compartmentalization – natural defense process in trees by which chemical and physical boundaries are created that act to limit the spread of disease and decay organisms.

crown – upper part of a tree, measured from the lowest branch, including all the branches and foliage.

decay – (1) (noun) an area of wood that is undergoing decomposition. (2) (verb) decomposition of organic tissues by fungi or bacteria.

dominant leader/trunk/stem – the stem that grows much larger than all other stems and branches.

dripline – the outer most portion of the crown of a tree.

easement – legal interest in real property that conveys use or partial use, but not ownership, of a portion of an owner's property.

espalier – the combination of pruning, supporting, and training branches to orient a plant in one plane.

facility – a structure or equipment used to deliver or provide protection for the delivery of an essential service, such as electricity or communications.

flagging – (1) symptom in which leaves on a branch wilt and may ultimately turn brown

without falling from the shoot. (2) colored tape used to mark trees.

good structure/architecture/form – branch and trunk architecture resulting in a canopy form that resists failure.

ground work – all work on a job site except the making of pruning or removal cuts.

hanger – loose, dangling or unsecured limb in the canopy of a tree.

heading – cutting a shoot back to a bud, or cutting a branch back to a bud, stub or lateral branch not large enough to assume apical dominance. Cutting an older branch or stem back to a stub. Depending on the placement of the heading cut it is called: 1) heading to a bud; 2) heading to a lateral; or 3) internodal heading. Excessive heading cuts to reduce tree height shall be avoided.

hazard – situation, condition, or thing that may be dangerous. (1) in tree management, a tree or tree part that is likely to fail and cause damage or injury, and the likelihood exceeds an acceptable level of risk. (2) in tree care or forestry operations, the presence of a condition or situation that may cause harm or injury to workers.

hazard assessment – systematic process of identifying hazards. See risk assessment.

horticulture – art and science of growing, handling, and processing fruits, vegetables, and ornamental plants.

included bark – bark that becomes embedded in a union (crotch) between branch and trunk or between codominant stems resulting in weak structure.

infectious – capable of being spread to plants from other plants or organisms.

Integrated Pest Management (IPM) – method of controlling plant pests by combining biological, cultural, mechanical, physical, and/or chemical management strategies.

International Society of Arboriculture (ISA) – an organization devoted to research, technology and education to promote the professional practice of arboriculture and foster a greater worldwide awareness of the benefits of trees. ISA was founded in 1924.

internode – the area between lateral branches or buds.

invasive species – non-native organisms likely to spread, disrupting the natural balance of an ecosystem.

job briefing – the communication of at least the following subjects for arboricultural operations: work specifications, hazards associated with the job, work procedures involved, special precautions, electrical hazards, job assignments, and personal protective equipment.

interior foliage – typically small-diameter (less than 3 inches) branches with foliage on the interior or inner portion of the crown.

kerf – slit or cut made by a saw in a log. Space created by a saw cut.

lateral – secondary or subordinate branch or root.

leader – primary terminal shoot or trunk of a tree. Large, usually upright stem. A stem that dominates a portion of the crown by suppressing lateral branches.

liability – something for which one is responsible. Legal responsibility.

lion tailing – poor pruning practice in which an excessive number of live branches are thinned from the inside and lower part of specific limbs or a tree crown, leaving mostly terminal foliage. Results in poor branch taper, poor wind load distribution, and a high risk of branch failure.

live crown ratio – the ratio of the height of crown containing live foliage to the overall height of the tree.

mature tree – trees that have reached at least 75 percent of their typical final height and spread.

method – a type of pruning procedure for achieving an objective.

mitigation – in tree risk management, reducing, alleviating, or minimizing risk of harm (damage or injury).

native species – plants indigenous to a region. Naturally occurring and not introduced by man. Contrast with exotic species, introduced species, and naturalized species.

off-site tree – a tree located on property other than where work is authorized to occur.

Occupational Safety and Health Act (OSHA) – the legislative Act dealing with health and safety in the workplace.

Occupational Safety and Health Administration 29 Code of Federal Regulations 1910.268, 269, 331, 333 (commonly referred to as OSHA 29 CFR 1910) – for the purpose of this document the sections that apply to the regulations that govern safe work distances. Anyone who works within 10 feet of energized conductors must have additional training requirements beyond those necessary for regular tree care and urban forestry operations.

parent branch – larger branch or stem from which a smaller, lateral branch arises.

parts to be removed – the location in the crown of a tree where pruning work will be performed. This can be specified as all of the crown or just the section(s) of the crown to be pruned.

petiole – stalk or support axis of a leaf.

permanent branches (permanent limbs) – in structural pruning of young trees, branches that will be left in place, often forming the initial scaffold framework of a tree.

pest – organism (including, but not limited to, weeds, insects or fungi) that is damaging, noxious, or a nuisance.

pesticide – any chemical used to control or kill unwanted pests such as weeds, insects, or fungi.

photosynthesis – process in green plants (and in algae and some bacteria) by which light energy is used to form glucose (chemical energy) from water and carbon dioxide.

phytotoxic – term to describe a compound that is poisonous to plants.

plant health care (PHC) – comprehensive program to manage the health, structure, and appearance of plants in the landscape.

pollarding – specialty pruning technique in which a tree is kept relatively short. Starting on a young tree, internodal cuts are made at a chosen height, resulting in the development of callus knobs at the cut height. This technique requires regular (usually annual) removal of the sprouts arising from the cuts.

pruning – removing branches (or occasionally roots), or shortening branches or leaders on a tree to achieve a specified objective(s). Certain kinds of pruning are prohibited and a violation of the standards. For example topping a tree, pruning without regard for health or structural integrity, making incorrect pruning cuts, etc.

qualified line-clearance arborist – An individual who, through related training and on-the-job experience, is familiar with the equipment and hazards in line clearance and has demonstrated the ability to perform the special techniques involved. This individual may or may not be currently employed by a line-clearance contractor.

qualified line-clearance arborist trainee – An individual undergoing line-clearance training under the direct supervision of a qualified line-clearance arborist. In the course of the training, the trainee becomes familiar with the equipment and hazards in line-clearance and demonstrates ability in the performance of the special techniques involved.

raising – selective pruning to provide vertical clearance; also known as lifting.

reaction zone – natural boundary formed chemically within a tree to separate damaged wood from existing, healthy wood. Important in the process of compartmentalization.

reducing – pruning to decrease height or spread on entire tree or one section; also referred to as reduction pruning. Excessive reducing is not recommended for the health of a tree.

reduction cut (drop-crotch cut, lateral cut) – pruning cut that reduces the length of a branch or stem back to a lateral branch large enough to assume.

removal – removal of most of the above ground portion of a tree by cutting to a stump or to a point on the main trunk where no side branches remain. May also include stump removal.

removal cut (thinning cut) – Cut that removes a branch at its point of origin. Collar cut.

restoring – the process of pruning to improve the structure, form, and appearance of trees that have been improperly trimmed, vandalized or storm damaged.

rigging – method of using ropes and hardware. (1) in tree pruning or removal, to control or direct the descent of cut material or to handle heavy loads. (2) with cranes, loaders, or other equipment, to lift heavy loads.

right-of-way (ROW) – defined area of land, usually a linear strip, reserved for the passage of traffic (paths and roadways) or the construction, maintenance, and operation of various aboveground or underground utilities. ROW users may be owners (public and private roadways are common examples) or may be granted easement rights by the owners (utility corridors are common examples).

risk assessment – the process of evaluating the potential of a tree or tree part to fail, on a potential target.

root protection zone – surface area of tree root concentration to be protected from construction damage, usually soil compaction damage. Best accomplished by fencing off the entire root protection zone.

sanitation – cultural practice of removing dead, infested, or diseased plant parts to reduce the spread of insects or disease.

scaffold limb – (1) pertaining to tree architecture or form, a strong and properly spaced arrangement, framework, or system of branches throughout the crown. (2) a work platform, which may be stationary or moving.

service drop – low-voltage (generally 110 to 750 volts) electric supply lines that connect end users to an electric distribution supply network. Service lines.

shall – denotes a mandatory requirement.

shearing – cutting back exterior growth using internodal heading cuts in one to two year old wood resulting in a defined edge with thick outer growth. Outer growth is regularly shaved to maintain the shape and outer density.

shoot – new stem or branch growth on a plant.

should – denotes an advisory recommendation.

sign – physical evidence of a causal agent (e.g., insect eggs, borer hole, frass). Contrast with symptom.

soil compaction – compression of the soil, often as a result of vehicle or heavy equipment traffic, that breaks down soil aggregates and reduces soil volume and total pore space, especially macro-pore space.

specifications – detailed plans, requirements, and statements of particular procedures and/or standards used to define and guide work.

stem – woody structure bearing foliage and buds that gives rise to other stems (branches).

stress – (1) in Plant Health Care, a factor that negatively affects the health of a plant; a factor that stimulates a response. (2) in mechanics, a force per unit area.

structural defects – any naturally occurring or secondary conditions such as cavities, poor branch attachments, cracks, or decayed wood in the trunk, crown, or roots of a tree that may contribute to structural failure.

structural pruning – pruning to establish a strong arrangement or system of scaffold branches.

structural roots – large, woody, tree roots that anchor and support the trunk and crown. Roots characterized by secondary thickening and relatively large diameter, giving form to the root system and functioning in anchorage and support.

stub – portion of a branch or stem remaining after a stub cut, branch breakage, or branch death.

subordination – pruning to reduce (suppress) the size and ensuing growth of a branch in relation to other branches or leaders.

sucker – shoot arising from the roots. Contrast with watersprout.

sunscald – injury to bark tissues on the trunk and branches caused by rapid changes in temperature, especially on warm days and cool nights in winter.

symptom – plant reaction to a disease or disorder (e.g., wilting, dieback). Contrast with sign.

target – (1) person, object, or structure that could be harmed (damaged or injured) by a tree or tree part in the event of failure. (2) location of target pruning.

temporary branches – in structural pruning of young trees, branches (generally the lower branches) that are left in place or subordinated but will be removed later in forming the permanent branches.

thinning – in pruning, the selective removal of live branches to provide light or air penetration through the tree or to lighten the weight of the remaining branches.

throwline – thin, lightweight cord attached to a throw bag or throwing ball used to set climbing or rigging lines in trees.

topping – inappropriate pruning technique to reduce tree size. Cutting back a tree to a predetermined crown limit; often, but not always, at internodes. Could also be an indiscriminate reduction of tree height. Not a recommended industry standard. Considered malpractice.

tracing – the removal of loose, damaged tissue from in and around a wound.

tree – woody perennial usually having a single elongated trunk or stem.

tree attachment – any foreign object affixed to a City owned tree, such as signs, holiday lighting, bicycle locks/chains, wildlife nesting boxes, etc.

tree protection zone (TPZ) – defined area within which certain activities are prohibited or restricted to prevent or minimize potential injury to designated trees, especially during construction or development.

tree protection zone barrier (TPZB) – various devices, including fencing berms or signs, installed to limit access to tree protection zones (or similarly designated area) during construction, development, or site disturbance.

tree value – (1) appraised, monetary value placed on a tree. (2) nonmonetary benefits(s) of a tree.

trenching – linear, open excavation, often used to install utilities or structural footings. Can cause tree root damage. Contrast with horizontal boring, tunneling, and radial trenching.

trunk – stem of a tree.

trunk flare – transition zone from trunk to roots where the trunk expands into the buttress or structural roots. Root flare.

tunneling – digging, often with special machinery and shoring or other supports, below the surface of the ground without an open trench. Alternative for installation of underground utilities that avoids cutting of tree roots or damage to hardscape or existing utilities. Contrast with horizontal boring, trenching, and tunneling.

urban forestry – management of naturally occurring and planted trees and associated plants in urban areas.

union (crotch) – the junction between a stem and branch or between stems.

utility – a public or private entity that delivers a public service, such as electricity or communications.

utility space – the physical area occupied by a utility’s facilities and the additional space required to ensure its operation.

vector – the carrier of a disease that affects tree health.

vista/view pruning – selective pruning to enhance a specific view without jeopardizing the health of the tree.

watersprouts – upright, epicormic shoots arising from the trunk or branches of a plant above the root graft or soil line. Incorrectly called a sucker. Contrast with sucker.

wound – an opening that is created when the bark of a live branch or stem is cut, penetrated, damaged, or removed.

wound dressing – compound applied to tree wounds or pruning cuts. Not a recommended treatment.

Appendix A: Tree Recommendation List

<http://www.ext.colostate.edu/pubs/garden/treereclist.pdf>

(need to finalize & add Longmont’s Tree Species Recommended List)

Appendix B: Tree Planting Detail

http://www.ci.longmont.co.us/public_works/designstd/documents/600details.pdf

Appendix C: Insect and Disease Fact Sheets/Pest Alert

http://ohioline.osu.edu/hyg-fact/3000/pdf/3308.pdf	DED
http://www.ext.colostate.edu/pubs/insect/05528.html	MPB
http://www.ext.colostate.edu/pubs/insect/05558.html	IPS
http://www.ext.colostate.edu/pubs/insect/0812_alert.pdf	TCD
http://www.ext.colostate.edu/pubs/insect/Emerald_borer.pdf	EAB

Appendix D: Additional Reference Materials - Suggested Reading and Professional Training Options

- A New Tree Biology and Dictionary** - Alex Shigo
- Abiotic Disorders of Landscape Plants: A Diagnostic Guide** - Laurence R. Costello
- An Illustrated Guide to Pruning: 3rd Edition** – Edward Gilman
- Arboriculture: Integrated Management of Landscape Trees, Shrubs, and Vines** – Richard Wilson Harris, James R. Clark, Nelda P. Matheny
- Arborists' Certification Study Guide: 3rd Edition** – International Society of Arboriculture
- Best Practices for Crane Use in Arboriculture: 3rd Edition** - Tree Care Industry of America
- Diseases of Trees and Shrubs: 2nd Edition** - Wayne Sinclair & Howard H. Lyon
- How to Survive an OSHA Inspection** – TCIA
- Insects & Diseases of Woody Plants of the Central Rockies** – CSU Cooperative Extension
- Modern Arboriculture** - Alex Shigo
- PHC for Woody Ornamentals** - John Lloyd
- The Tree Climber's Companion: 2nd Edition** - Jeff Jepson
- To Fell a Tree: A Complete Guide to Successful Tree Felling & Woodcutting Methods** – Jeff Jepson
- ArborMaster** – beginner to advanced training in climbing, rigging, & felling
www.arbormaster.com
- International Society of Arboriculture** – various training & certification options
www.isa-arbor.com

Rocky Mountain Chapter International Society of Arboriculture – regional chapter

www.isarmc.org/pro/index.htm

North American Training Solutions - beginner to advanced training in climbing, rigging & felling

www.northamericantrainingsolutions.com

Tree Care Industry of America - various training & certification options

www.tcia.org

