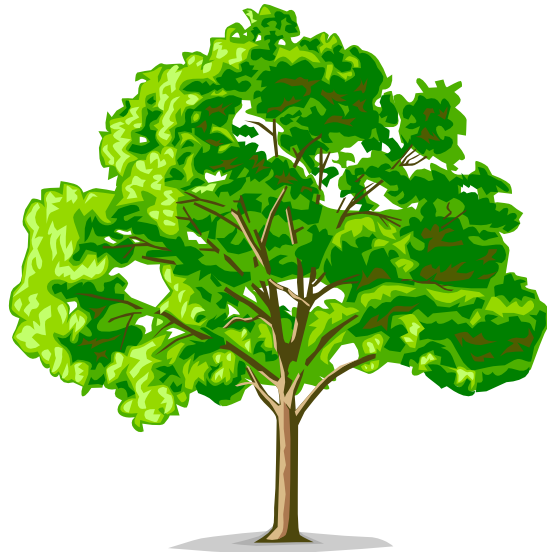


CITY OF VANCOUVER

STREET TREE GUIDELINES



FOR THE PUBLIC REALM
YEAR 2011 REVISION

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Purpose

It is the mission of related City staff to provide, preserve and advocate for street trees and landscaping in the public realm where possible, while balancing this with the competing street right-of-way uses and considerations, all in order to enhance the well being of individuals and communities in our City.

The function of this document is to bring together and describe all aspects of the street tree and landscape planting issues on City right-of-ways as directed in and outside of the Development Permit review process.

These guidelines are administered by the General Manager of Engineering Services, in consultation with the Director of Planning for Development Services and the General Manager of the Vancouver Park Board.

This document is to be used in conjunction with the Street Restoration Manual, <http://vancouver.ca/srm> , the Development Permit process and other landscape construction projects approved by the Manager of Engineering Services.

Park Board Mission Statement

To provide, preserve, and advocate for parks and recreation services to benefit people, communities and the environment.

The Goals of the Street Tree Manual are:

1. To establish the expected standards, specifications, and work procedures.
2. To communicate these expectations to all persons and agencies engaged in activities relating to the planting or protection of trees located on city property.
3. To ensure high quality and consistent work practices that results in a healthy and aesthetically pleasing urban forest.

The Urban Forest

The urban forest contributes greatly to the quality of life of Vancouver's inhabitants. It provides a wide variety of environmental, social, and economic benefits; such as air quality improvement, storm water reduction, wildlife habitat, sense of place, aesthetic beauty, and increased neighbourhood desirability. All trees and associated plants located throughout the City of Vancouver make up its urban forest. More than 135,000 trees grow along its boulevards and in its medians, they make a significant contribution to this forest.

The Vancouver Park Board has planted and maintained this asset since 1917, and continues to work year round to keep its inventory expanding and vibrant while employing professional arboriculture standards. The development community, utility contractors, the general public, and other City of Vancouver departments also have an important role to play in the management of this aspect of the urban forest. They are frequently called upon to provide and plant new trees, or work near existing trees while protecting their value. There are many challenges to the task of integrating urban forest management with other elements of urban function, the Street Tree Manual is a collection of reference material that should clarify the City of Vancouver's goals and expectations. For more information on the Park Board's street tree program, see <http://vancouver.ca/parks/trees/index.htm>

Authority (Street Tree Bylaw)

All trees within the boundaries of Vancouver form part of the urban forest. This document pertains only to those located on Engineering Services property; which by that virtue, are the property of the City of Vancouver. Those located on street rights-of-way, including lanes, are administered under the terms of the [Street Tree Bylaw No. 5985](#). Amongst other things, this bylaw stipulates that:

- All trees located in any boulevard of the City, shall be deemed to be the property of the City, and the care, custody and control of such trees shall be with the Board of Parks and Recreation.
- No person other than the Board of Parks and Recreation shall plant any tree in any boulevard without first having obtained the written permission of the City Engineer.
- The General Manager shall not permit the planting of any tree in a boulevard except in compliance with standards set by the City Engineer and the General Manager (Parks).
- No person shall remove, destroy, cut, deface, trim or in any way injure, impair or interfere with any street tree except as expressly authorized to do so by the Board of Parks and Recreation.

Trees located on private property are the responsibility of the property owner. The removal of those with a diameter over 20 cm is administered by the Community Services Group, as mandated by the [Protection of Trees By-law No. 9958](#). The remainder of this bylaw can be found at <http://vancouver.ca/bylaws/9958c.PDF>

Permission for Planting Trees on City Streets

Under the terms of the City's Street By-law, the Park Board is responsible for the care and custody of the boulevard trees as well as species selection, and their permission is to be obtained before trees are planted on the street boulevard. Prior to the tree planting, the actual tree locations and spacing are to be approved by Engineering Services. This is to ensure that the proposed tree locations do not conflict with existing or planned underground utilities, parking meters, access to abutting properties, use of the boulevard for bus stops, or street lighting coverage, etc.

Permission for planting trees on the street allowance can be obtained from the Streets Design Branch, by the abutting property owner or a representative of the owner. Before planting trees on a City street, the applicant should ensure that the following conditions have been, or will be met:

- The species, size of tree, general spacing (minimum of 7 metres) and planting specifications for the proposed street tree planting are to be approved by the Park Board, Arboricultural Section (Evans Yard, telephone # 604-257-8600, fax # 604-257-8601)
- No existing trees are to be removed and replaced as part of a street tree planting proposal without the permission of the Park Board.
- The alignment and specific locations (clearances from street lights, traffic signs, parking metres, driveways, street corners, bus stops, etc.) are to be approved by Engineering Services (Streets Design Branch, telephone # 604-871-6131).
- The applicant should check with the Utilities Branch in Engineering Services, or examine a utilities plan prior to digging the planting holes. Please note that drain tiles, underground sprinkling systems, street lighting conduit, and some other electrical ducts are not shown on utility drawings, but are usually located directly behind the curb, which is very close to, and sometimes within, the street tree planting area. If a service connection such as gas or a duct is encountered in an alignment or location which blocks the planting of a tree, the applicant can either pay for the service/duct to be relocated, or not plant a tree at that location.
- All digging of the holes in the street boulevard for street trees must be done by hand. No mechanical equipment is to be used to dig the holes (ie, no backhoes, post hole diggers, etc.)
- The applicant is responsible for traffic and parking control during the tree planting process. If tree planting is proposed for an arterial, commercial, or downtown street, the applicant is required to check with the Traffic

Management Branch in Engineering Services (telephone # 604-873-7342) to arrange parking restrictions, curb lane closures etc.

- The roadway, boulevard and sidewalk are to be kept in a safe condition during the planting work period, and reinstated afterward to a clean, safe condition, including any repairs to damaged boulevards.
- The applicant must notify the Park Board (Evans Yard, telephone # 604-257-8600, fax # 604-257-8601) one day in advance of the start of the work, so that Park Board staff may inspect the planting.
- The applicant is responsible for the maintenance of the trees for the first year, including summer watering, after which the Park Board will take over the care and custody (ownership) of the trees, provided they are healthy. The applicant will be responsible for removing and replacing any trees which fail to survive during the maintenance period.
- Where trees are being planted in openings in the sidewalk, the applicant must ensure that tree base treatment arrangements have been made with Engineering Services. If the sidewalk is new, concrete tree surrounds are to be installed after the tree planting (these are to be bought from Engineering Services),

The Park Board may be contracted to plant street trees on the applicants behalf. This can be arranged by phoning the Street Tree number (604-257-8587). Where this is done, permission from Engineering Services is not required, by the applicant. There is a set fee structure in place that is dependant on the size of the tree and the location of the site. Watering can similarly be arranged.

In some instances, the Park Board or Engineering Services may not approve a Street Tree Planting for various reasons (for example, when a tree beautification is already planned for the area). Tree planting will not be allowed if the street is not curbed.

To ensure the timely inspection of the planting details, trees, and subsequent care, the applicant must include the following text book on the final plan.

The applicant must notify the Park Board on the following dates:

When the boulevard or sidewalk has been fully prepared, the trees are on site but **not** yet planted and the required root barriers are **not** yet installed.

Eleven months after the planting of the trees.

First inspection date: _____ PB inspector _____

Second inspection date: _____ PB inspector _____

Tree Planting Standards

Preparation for planting

Trees should be dug and moved during the dormant season, in a well watered condition, and in accordance with the Canadian standards for Nursery Stock, current edition.

Tree roots should not be exposed to intense winter cold after they are lifted. Use mulch as protection.

Excavation of the subgrade below shall be only as necessary to permit the bottom of the rootball to sit on undisturbed material or compacted fill such that the top of the rootball remains at the proper finished grade.

If indicators of poor drainage are detected before or during the time of planting, notify the Park Board to obtain revised planting specifications.

Planting

Finished grade - The tree should be installed such that the top of the root ball is even with the surrounding soil – after settlement. If there is a chance of some settling after planting, install such that the top of the root ball is 2 to 4 cm above the surrounding grade. Trees with bark buried beneath the soil line will not be accepted.

Wherever possible, the hole should be dug with sloping sides. Preferred angle is 45 degrees.

The tree should be lowered gently into position, not dropped.

Trees should be as vertical as possible. If planting in a surround, the stem should be close enough to centre that at least some part of the tree is in dead centre.

Position the tree so that lower branches will not conflict with traveled portions of the sidewalk of street. Notwithstanding conflicts, the tree should be positioned for most attractive viewing. If pruning is necessary in order to provide pedestrian clearance,

Backfill should be a 50 /50 mixture of native soil and amending soil mix. the two mixes should be applied by shovel in alternating fashion, tamped gently with light boot pressure.

When the backfill has been placed up to about 2/3's of the rootball height, basket ties should be cut and the top 1/3 of the burlap and basket folded back downwards. No burlap or wire should be showing above the finished grade.

Ties must be pushed back into the lower portion of the hole.

A 10 cm raised saucer, of inside diameter equal to the outside diameter of the root ball,

should be constructed around the perimeter of the rootball to enhance water infiltration.

A mulch of organic material (other than cedar) should be placed inside the berms of the saucer, to a depth of 7 – 9 cm.

Trees should be immediately and adequately watered after planting.

When planting where Park Board has determined that drainage correction is impossible or impractical, the root collar should be planted higher in relationship to the surrounding soil by 7.5 to 10 cm.

Root Barriers

Root barriers must be installed at the time of planting whenever a tree is installed within 2 metres of a sidewalk or other hardscape feature – excluding roads; or where specified on approved drawings.

Barriers must be made commercially, produced for the purpose of deflecting roots downward, and be of a specification approved by City of Vancouver Engineering Department.

Placement must be as per manufacturer's instructions.

Tree Placement

Spacing

The optimum spacing of trees in the public realm is achieved by balancing aesthetic and environmental values with the physical form of the tree being used, and the carrying capacity of the site. In general, the City of Vancouver aims for the maximum amount of tree coverage that is attainable while respecting site lines, utilities, and other important landscape elements. Site specific exceptions to this goal may be requested by the applicant or required by the City of Vancouver.

General Guidelines

When planting a portion of a block, match existing spacing where appropriate – whether on the same or opposite side of the street.

Plant so that the species/cultivar being planted will grow to close canopy at about the age of twenty in high density zoning, and the age of thirty in single unit areas where the trees are able to grow to a larger size, and the landscape is softened already by existing greenspace.

Consider public safety and lighting factors.

Tree planting plans should indicate existing trees, and existing and proposed utilities and amenities.

Spacing is considered on a site average scale, and preference is to match existing tree spacing. Individual tree positions are subject to offsets.

Minimum Spacing

Tree size category	Average Spacing
LARGE	9-11 metres
MEDIUM	8-10 metres
SMALL	8-10 metres
COLUMNAR	6-10 metres

Clearances

Listed below are the preferred minimum distances trees should be planted from:

Lamp Standards	1.5 – 4.5 metres
Electrical/Communication/Trolley Poles	1.5 metres
Driveways/Crossings	1.8 metres
Fire Hydrants	1.8 metres
Catch Basins/Valve Boxes	1.5 metres
Corner Clearance (from extended P/L)	3 metres
Stop Signs	6 metres
Parking meters	Clear of Tree Pit/Surround
Buildings – Spreading Trees	3 metres
Buildings - Columnar Trees	2 metres

Trees are not planted in the following locations:

1.	Over building encroachments under sidewalk (areaways)
2.	Under canopies or overhead signs
3.	In bus zones, except in bus bulges in line with other trees on block
4.	In loading or passenger zones
5.	In front of doorways, entrances, walkways

Where double rows are required by the City of Vancouver the back row must be on private or park property.

The curb side edge of a tree surround must be at least 0.15 metres from the back of the curb.

Space trees appropriately away from existing street and private trees.

Spacing is approved by Engineering Services – Street Design Branch, in conjunction with the City Arborist or designate. All final locations must be approved by Engineering Services – Street Design Branch.

Plant Material

For street trees, the City of Vancouver uses the standards for trees described in Canadian Standards for Nursery stock 8th edition. The full description of which can be found at

<http://www.canadanursery.com/Page.asp?PageID=122&ContentID=868>

Additional specifics for City of Vancouver, all trees must be:

1. nursery field grown (exception must be pre-approved)
2. be on a single leader, with the lowest branch being at least 2 metres high on the stem.
3. of 6 cm caliper or greater if deciduous
4. of 2.5 metres height or greater if coniferous
5. free of pest and disease
6. free of pernicious weeds in the root ball
7. free of injury, or other defects
8. free of girdling roots

Where planting projects require more than 10 trees, the C.O.V. reserves the right to select and tag optimal specimens at the source or wholesale nursery.

All exceptions to the above standards and specifics must be pre approved by the City Arborist or designate.

Minimum root ball diameters for coniferous trees

Height	Tall and columnar	Tall and broad
200 cm	50 cm	60 cm
250 cm	55 cm	70 cm
300 cm	70 cm	85 cm

Minimum root ball diameters for deciduous trees

Caliper	Root ball diameter
6 cm	60 cm
7 cm	70 cm
8 cm	80 cm
9 cm	90 cm
10 cm	100 cm
12.5 cm	110 cm
15 cm	120 cm

Species Selection

The Park Board Arboriculture Section has compiled a large body of information on the performance and maintenance requirements of different tree species and cultivars. After the one year establishment period, the Arboriculture Section will be responsible for all maintenance services to those trees, including their replacement should they not survive. Therefore, the Park Board wishes to ensure that trees planted are:

1. tolerant of local growing conditions
2. have adequate space to reach its natural form at maturity
3. not prone to branch failure or windthrow
4. not susceptible to pests
5. not possessing significant nuisance problems (large nuts, allergenic properties)
6. not requiring excessive maintenance

Diversity adds resilience to the urban forest. The Street tree management plan mandates the Park Board to manage the street tree population so that no more than 20 % of its total population consist of one genus and no more than 10 % consists of one species.

This applies on a local and project scale as well. Tree species diversity requirements are:

No of trees in Development Project	Max Percentage of One Genus	Max Percentage of One Species
> 100	40%	25%
50 – 100	50%	30%
25 – 49	100%	50%
1 – 24	100%	100%

Every project has different properties, the Park Board is open to suggestions pertaining to aesthetics and other project specific criteria.

The City Arborist, or designate, must authorize all tree species selections prior to the planting of any street trees.

Preferred Street Tree Species List

This list is to be used only as a general guide. Other species/cultivars may do well on streets. Trees listed as unsuitable may be fine for park or garden settings. Remember to always plant the right tree for the right place.

Large Trees

Trees over 50 ' in height and 25 ' in width. Suitable for boulevards with no overhead obstructions and > 10 ' of width.

Botanical Name	Common Name
Acer Platanoides	Norway Maple
Acer Cappadocicum	Cappadocicum Maple
Aesculus X Carnea 'Briottii' Or 'Baumanni'	Red Or Seedless H. Chestnut
Cercidiphyllum Japonicum	Katsura Tree
Fagus Sylvatica	European Beech
Fraxinus Americana	American Ash
Ginkgo Biloba	Maidenhair Tree
Magnolia Grandiflora	Southern Magnolia
Metasequoia Glyptostroboides	Dawn Redwood
Quercus Acutissima	Sawtooth Oak
Quercus Palustris	Pin Oak
Quercus Phellos	Willow Leaf Oak
Robinia Pseudoacacia 'Frischia'	Golden Black Locust
Tilia Tomentosa	Silver Linden
Zelcova Serrata 'Green Vase'	Zelcova

Medium Trees

Trees maturing between twenty-five (25) and fifty (50) feet are generally suitable for situating on a blockside tree lawn three (3) feet or greater between curb and sidewalk.

Botanical Name	Common Name
Acer Campestre 'Queen Elizabeth'	Campestre Maple
Acer Pennsylvanicum	Moosewood
Acer Rubrum	
'October Glory' Autumn Blaze' 'Autumn Flame'	Red Maple

Acer Truncatum	Truncatum Maple
Carpinus Betulus	European Hornbeam
Corylus Colurna	Turkish Hazel
Davidia Involucrata	Dove Tree
Fraxinus Ornus	Flowering Ash
Gleditsia Triacanthos	Honey Locust
Magnolia Kobus (Root Stock)	Japanese Magnolia
Nyssa Sylvatica	Black Tupelo
Parrotia Persica	Persian Persica
Prunus Yedoensis 'Akebono'	Yoshino Cherries
Sorbus Alnifolia	Korean Mountain

Small Trees

Trees maturing twenty-five (25) feet. Suitable for locating at or below overhead electrical conductors

Botanical Name	Common Name
Acer Griseum	Paperbark Maple
Acer Palmatum (Tree Form Varieties)	Japanese Maple
Acer Platanoides 'Globosum'	Globe Maple
Amelanchier Canadensis 'Princess Dianna'	Tree Form Service Berry
Cercis Canadensis	Eastern Redbud
Cornus Nutalli 'Eddies White Wonder'	Eddies White Wonder
Cornus Kousa 'Chinesnis' 'Satomi'	Japanese Dogwood
Crataegus Phaenopyrum'treeform'	Washington Hawthorn
Crataegus Monogyna	Singleseed Hawthorn
Crataegus X Lavalley	Lavalle Hawthorn
Hibiscus Syriaca	Tree Form Hibiscus
Malus X Floribunda (Disease Resistant Cultivar Recommendations Available)	Flowering Crabapple
Magnolia Stellata	Star Magnolia
Prunus Pissardii	Pissard Plum
Styrax Japonica	Japanese Snowbell
Syringae Reticulata	Tree Lilac

Columnar Trees

Trees exhibiting a distinct upright branch arrangement. Suitable for locating in confined situations or on tree lawns offset from overhead electrical conductors.

Botanical Name	Common Name
Acer Nigra 'Green Column'	Black Maple
Acer Platanoides 'Columnar' 'olmstead'	
'Crimson Sentry' 'Cleveland'	Columnar Norway Maple
Acer Rubrum	
Karpick "bohall", 'Scarlet Sentinel'	Upright Red Maple
Acer Freemanii	
'Scarlet Sentinel' 'Armstrong'	Freeman's Maples
Carpinus Betulas 'Fastigiata'	European Hornbeam
Fagus Sylvatica 'Dawycki'	Dawycki Beech
Gingko Biloba 'Sentry' 'lakeview'	Ginko Tree (Maidenhair)
Parrotia Persica 'Vanessa',	
'Inges Ruby Vase'	Upright Parrotia

Conifers

Cone bearing trees are not generally planted on boulevards due to their low branching habit when young. Nonetheless, they are a desirable type of tree top plant where space allows. Traffic medians are often suitable. Below are some typically specified species.

Botanical Name	Common Name
Calocedrus Decurrens	California Incence Cedar
Cedrus Atalntica 'Glauca'	Blue Atlas Cedar
Cedrus Deodar 'Kashmir'	Deodar Cedar
Chamaecyparris Nootkatensis	Nootka Cypress
Pinus Nigra	European Pine
Picea Omerika	Serbian Spruce
Thuja Plicata	Western Red Cedar

Amending Soil Mix

For use in tree cutouts, trenches, and in engineered (structural) soil mixes

General specifications

Must be either commercially prepared soil, or be City approved material from the planting site.

Soil must be virtually free of invasive plants seeds of viable plant parts.

Soil must be virtually free of subsoil, non-composted manure, building materials, non composted wood, insect or fungal pest organisms, sawdust, or other extraneous materials.

Soil textural standards-measured as a percentage of dry weight of total soil mix

Coarse gravel (>19 mm < 40 mm)	0 % – 1 %
All gravel (> 2 mm < 40 mm)	0 % – 5 %
Sand (> .05 mm < 2 mm)	83 % - 88 %
Silt (>.002 mm < .05 mm)	12 % -17 %
Clay (< .002 mm)	0 % - 5 %
Clay and Silt	12 % - 16 %
Organic Content	5 % - 10 %
Acidity (ph)	6.0 - 7.0
Carbon: nitrogen ratio maximum	25:1

Chemical properties

Salinity	= < 3.0 milliohms /cm (at 25 C)
Boron	< 1.0 ppm
Sodium	sodium absorption ratio < 8.0
Nitrogen	0.2 – 0.6 % by weight
Available phosphorus	50 – 200 ppm

Testing

Soil testing must be conducted by an accredited commercial laboratory.

Soil sample must be representative of entire quantity of soil being used.

Results must be approved prior delivery of material.

All exceptions to the above standards and specifics must be pre approved by the City Arborist or designate.

Protecting Street Trees During the Development Permit Process

Boulevard Trees

Street trees may not be removed, pruned, moved, or otherwise impaired, interfered with, or injured without prior approval from the City Arborist. Should there be a conflict with a street tree and the normal enjoyment of one's property, or a permitted activity; the City Arborist will determine if corrective action is warranted.

Only VPB arborists, or arborists authorized by the City Arborist, may prune or remove street trees.

A site visit by an Arborist Inspector can be arranged by calling **311**, or by following the email instructions at:

<http://vancouver.ca/parks/trees/request.shtml>

Site and construction planning

DP construction drawings and crossing permit application drawings should have all street trees marked on the site plan, as well as any street trees within 2 metres of either side property line.

Site access should be planned with consideration for avoiding conflicts with street trees. Alternate access routes may be required to protect street trees.

Soil compaction reducing techniques such as weight displacement plates or thick wood mulch (20 – 30 cm) may be required by the City Arborist if street tree rooting area is likely to be affected by vehicular movement.

Temporary storage sites of construction material or soil excavate should be as far from neighbouring trees as possible.

The location of all underground services should be marked on the DP drawings. Alignments should be outside of the required protection zone, and as far as possible from large trees.

The applicant may not alter the existing grade within the drip line of a street tree, except to raise the grade by no more than:

- (i) five centimeters within a one metre circumference around the trunk, and
- (ii) a further five centimetres between the one metre circumference and the

circumference of the drip line of the tree.

Inspections

For street tree related requests, an Arborist Inspector can be arranged by calling **311**, or by following the email instructions at:

<http://vancouver.ca/parks/trees/request.shtml>

Pruning

If branches unavoidably obstruct work activities, or if they are in such proximity that they are likely to be damaged, then pruning can be arranged. A VPB Inspector, in conjunction with a representative of the applicant, will determine the most appropriate action. Small alterations can be made at the time of visit, more significant pruning work, or tree removal work where warranted, can be arranged at that time. Work directly related to the DP, that would not otherwise be done by the VPB, is charged to the applicant.

Tree Removal

On rare occasions, street trees are removed upon the request of the applicant. VPB approval for such action will be given if, in the opinion of the City Arborist:

- the tree is dead, dying, or diseased; or is of a species or in a location determined to be a public nuisance.
- his work cannot be completed without its removal.

The VPB will pay the costs of removing and replacing trees that are dead, dying, diseased, or grossly inappropriate for the site. The applicant must pay the removal and replacement costs of trees that would otherwise be retained by the VPB, as well as the appraised monetary value of the lost tree. The Plant methodologies outlined in the 'Plant Appraisers Handbook' (9th edition) and the 'Species Ratings for landscape tree appraisal' (PNW – ISA, 2007) will be the resource materials used.

Protection barrier (excerpted from Bylaw #9958)

Before a person commences demolition, excavation, or construction on a site, the owner of the site must install a protection barrier around all boulevard trees between the extension of the two side property lines across the boulevard; or within two metres on either side of these lines.

Street trees can be damaged or destroyed from lack of accommodation during the demolition / construction process. The usefulness of soil to a tree can be permanently reduced by the compacting forces caused by vehicle / equipment passage or material

storage – *even one occurrence*. One of the preventative measures to be taken, in compliance with the permitting process, is the installation of tree protection barriers. These temporary enclosures are intended to cordon off the most critical parts of the tree system - its branches, main stem, root system and surrounding topsoil, from work activities.

Installation

A protection barrier must have the following attributes:

- is at least 1.2 metres high measured from the ground, mounted on steel or sturdy wooden posts. Fence posts should be installed no farther than 2.4m apart.
- distance of barrier from near edge of tree trunk, measured parallel to curb and 1.4 m above grade of the ground is as follows:

MINIMUM PROTECTION REQUIRED – parallel to curb

Trunk Diameter	Distance from Trunk
20 cm	1.2 metres
25	1.5
30	1.8
35	2.1
40	2.4
45	2.7
50	3.0
55	3.3
60	3.6
75	4.5
90	5.0
100	6.0

Distance of barrier from near edge of the tree to near edge of the curb, measured at right angles to the curb is:

0.6 metres

Distance of barrier from near edge of the tree to near edge of sidewalk, measured at right angles to the curb is:

0.3 metres

In situations where the curb or sidewalk are absent:

- the roadside edge of the grass boulevard will substitute as the curb edge

- the barrier will extend back to outer edge of the boulevard (p/l), or for the same distance as used parallel to curb, as specified above, whichever is less.

Consists of snow fencing fastened securely to metal or wood stakes spaced no more than one metre apart, or other fencing acceptable to the City Engineer.

Exceptions

The perimeters or heights of these barriers may be adjusted, with the prior approval of the City Engineer to ensure that site lines to fire hydrants and crosswalks are not obstructed.

Maintenance of protection barriers

The tree protection barrier must be in place before any land clearing/alteration, utility removal or installation, or building demolition or construction begins. It must remain in place until building permit completion.

The tree protection barrier may not be removed, or altered, for any period of time no matter how short the duration, without the authorization of the City Engineer or General Manager – VPB. No vehicles may pass through this protection area, no soil disturbance may occur.

The permittee must repair any damage to the barrier, in a timely manner.

No materials or soil, of any kind, may be stored on top of, or within the perimeter of the tree protection barrier ; for any period of time no matter how short the duration.

Prohibitions

(e) if required by the Director of Planning, tunnel rather than trench when installing underground utilities and drainage lines, which technique includes boring a hole under or through the root system with minimum disturbance, and carry out any excavation within the tree protection area to accommodate underground installations, including services and footings, by hand; and

Ornamental Lights in Street Trees

The Street Tree Bylaw (# 5985) forbids the placement of any wire or other contrivance in City trees. The reason for this restriction is that the fixation of wires to trees can kill branches, preempt tree care, or possibly create a risk of electrocution

A variance can be arranged provided that the following conditions are met:

- The installation of ornamental lights in street trees will only be permitted in commercially zoned areas.
- Prior to installation, a formal Encroachment Agreement (EA) is required. It must be approved by both the Park Board - Planning and Operations and Engineering - Electrical Design Departments.
- The EA applicant must submit a plan indicating which addresses are to receive lights , the wattage and approximate number of bulbs, the duration for which they will be in place, the power source , a maintenance schedule , and the name of the trades qualified electrician that will be installing and maintaining them. All light strings must be CSA approved for outdoor usage.
- Inspectors from the Streets Lighting Branch of Engineering and the Street Tree Section of the Park Board must approve all work to ensure that it is in compliance with the standards set forth in this document. Failure to meet any requirement may result in the disqualification of the permit, and the removal of the lights at the permit holder's expense.

The light strings should never be attached to tree branches with wires, nails, tape or strapping of any kind. They should be secured within the tree canopy by loosely looping the string around the branches. It should be placed near the centre of the tree, avoiding the ends of branches.

The Park Board will notify the EA holder one month in advance of conducting routine tree pruning, and discuss specific concerns. It will be the responsibility of the EA holder to remove wires that interfere with this maintenance. If the lights are not removed after notification, Park Board staff may upon their discretion prune the tree and will not be responsible for any damage to the lights or wires. The Park Board does not perform regular pruning in commercial areas during the month of December. In the event of tree emergencies such as storm damage or vehicle accidents, Park Board staff will immediately correct a hazardous situation. Park Board staff would not be able to contact the EA holder prior to performing the remedial work.

Application for Ornamental Lights on Street Trees

BIA / Business: _____

Address: _____

Telephone: _____

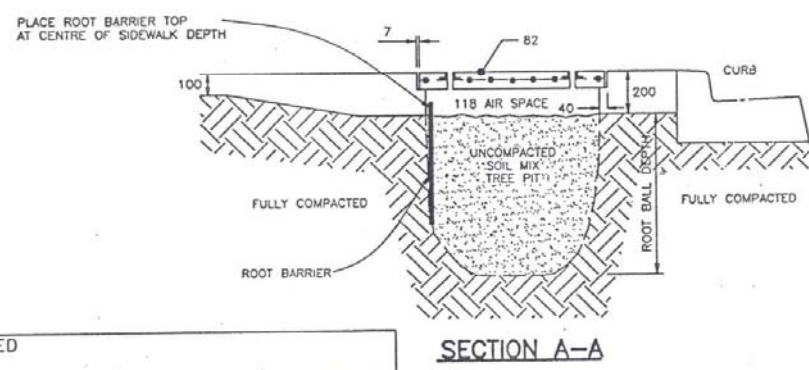
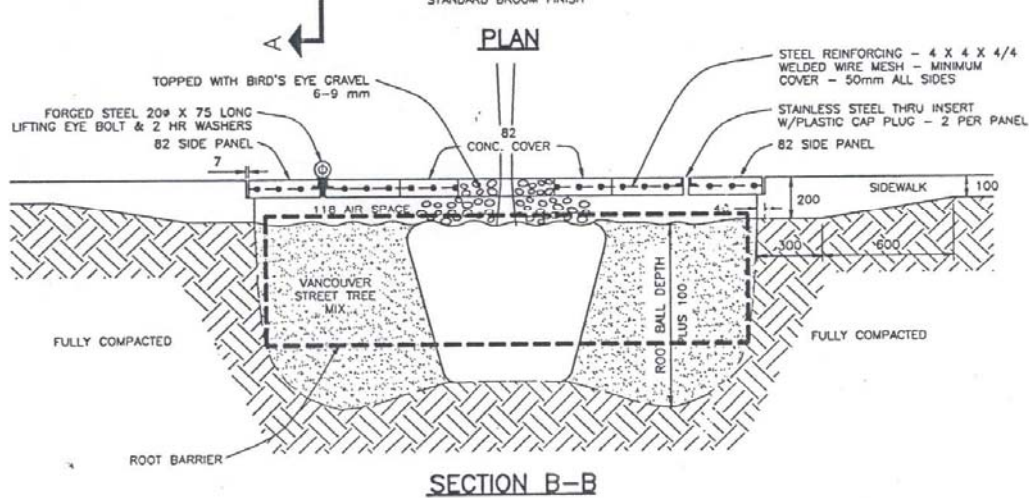
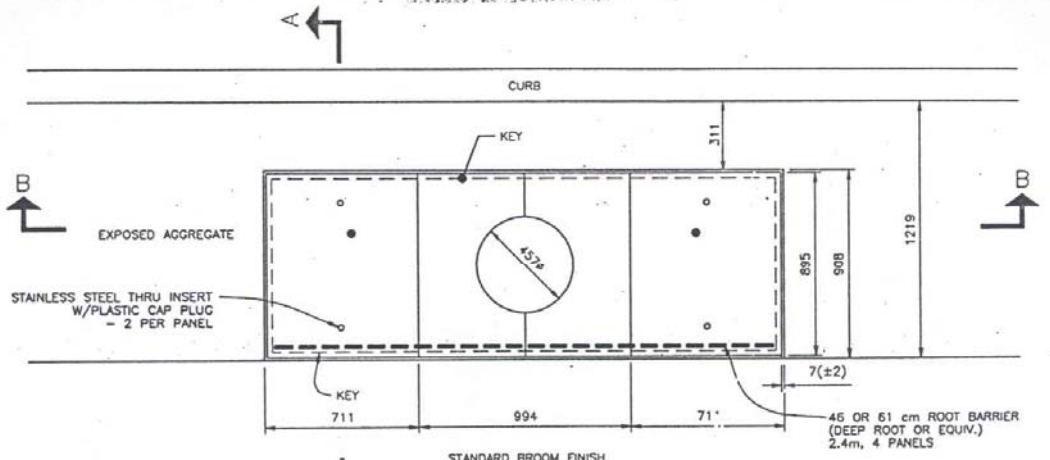
Email Address: _____

Blocks where lights will be strung: _____

Signing Officer: _____

Date: _____

ISSUE (DATE) APPROVED	DETAILS OF FOUR PIECE TREE SUP.ROUND NOT TO SCALE	STANDARD SECTION PAGE
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APPROVED
 GENERAL MANAGER OF ENGINEERING SERVICES
CITY OF VANCOUVER
 ENGINEERING SERVICES

STREETS - STANDARDS

REVISED TO LATEST
 DATE SHOWN
MF137-Z



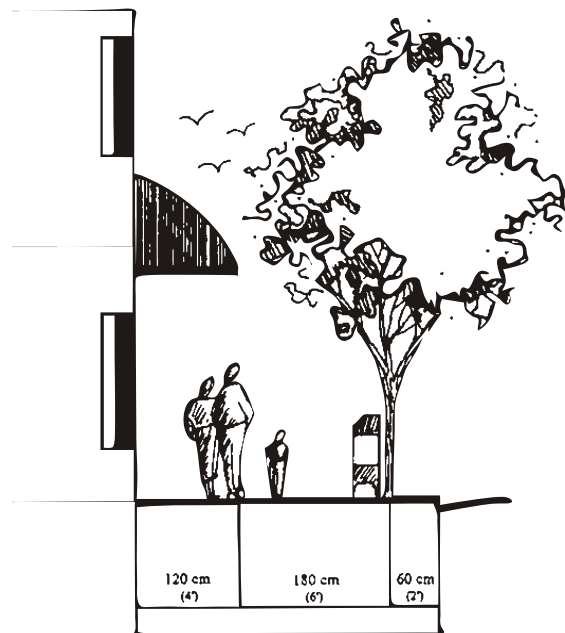
City of Vancouver Guidelines for Awning and Canopy Setbacks from Trees

The City of Vancouver recognizes that street trees are an important landscape element along its commercial corridors and downtown streets. All new awnings and canopies must be able to accommodate the maturing crowns of existing and future trees. The table below provides a quick reference for permit applicants who wish to install an awning or canopy overhanging City property. The accompanying scaled drawings illustrate typical situations that arise, and show minimum setbacks of awnings from trees. These setbacks recognize that trees grow, and that conflicts can be ratified with branch pruning only so far as to not cause damage or disfigurement to the tree. A listing and photo guide of recommended street trees in Vancouver, along with their mature sizes and shapes, can be found in the document “Street Tree and Landscape Guidelines for the Public Realm,” or at www.parks.bc.ca.

Type of tree / situation	Minimum setback
New Columnar trees (narrowly shaped at maturity)	120 cm
New Large, Medium, or Small Spreading trees	180 cm
Existing tree	180 cm or more depending on size and shape of tree.

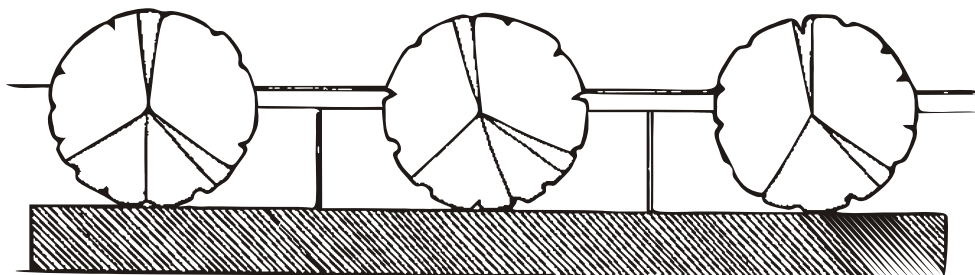
City of Vancouver Guidelines for Awning and Canopy Setbacks from Trees

Drawing 1 of 4 - Street Elevation drawing on typical commercial street



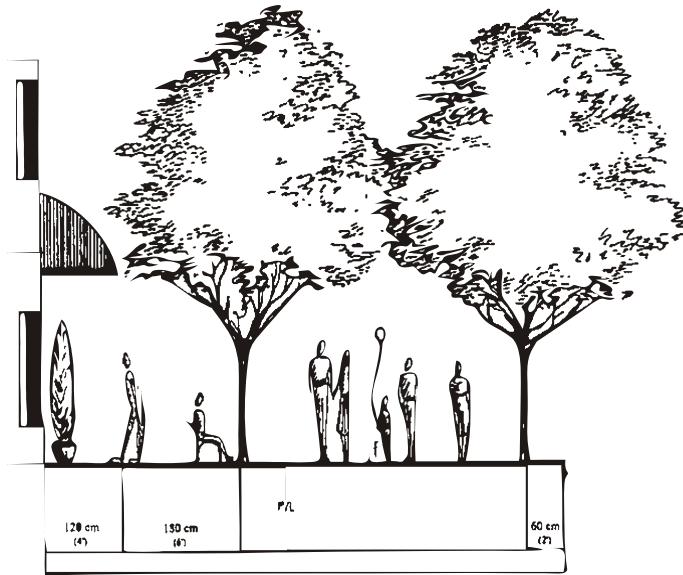
The overhang of the awning should come no closer than 180 cm to the centre of the tree trunk. Requests for awning configurations coming closer will be referred to Engineering Services - Streets Division for special consideration.

Plan view



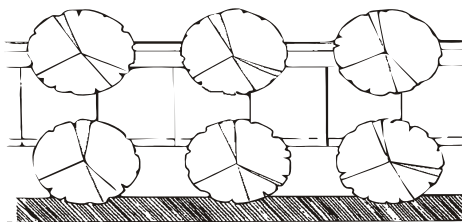
City of Vancouver Guidelines for Awning and Canopy Setbacks from Trees

Drawing 2 of 4 - Street Elevation drawing on street where a double row of trees is specified.



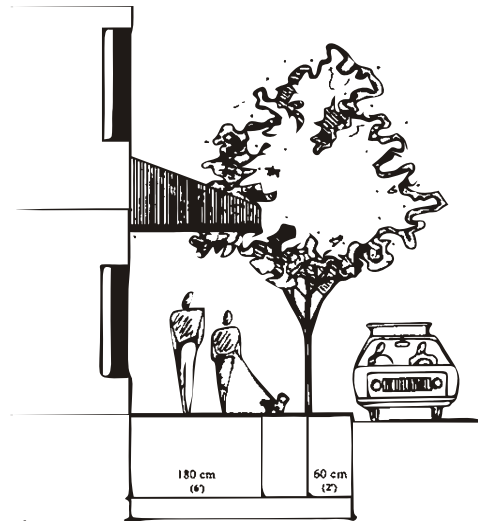
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Plan View



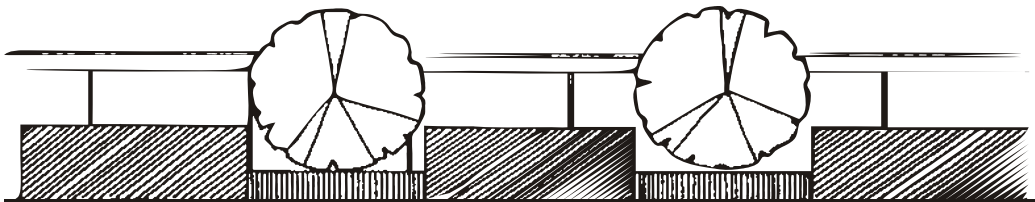
City of Vancouver Guidelines for Awning and Canopy Setbacks from Trees

Drawing 3 of 4 - Street Elevation drawing on street where there are existing trees whose crown conflicts with the proposed awning.



An inspection by the Vancouver Park Board - Street Tree Section is required. If any light tree pruning is to be done, it must be done by the Park Board staff prior to installation of the awning. Cutting will not be done if it is deemed by the Arborist to be harmful to the tree, adjustments must then be made to the configuration of the proposed awning. To contact Park Board call **257-8600**.

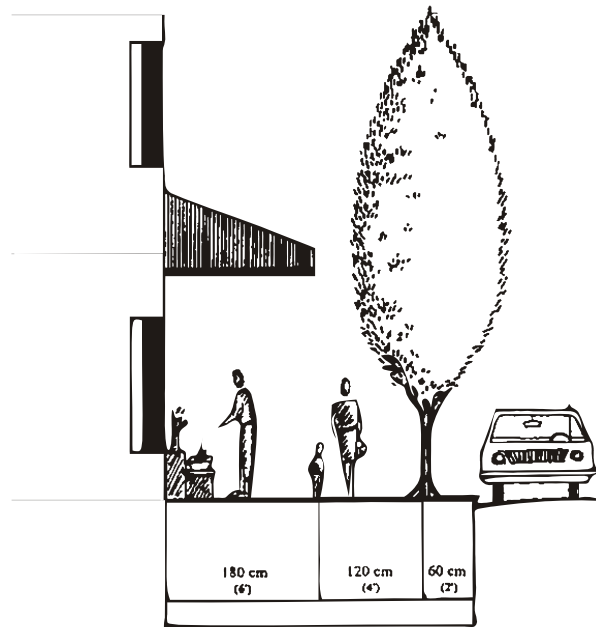
Plan View



Canopies must be variably shaped in order to accommodate existing trees when pruning would be harmful to them.

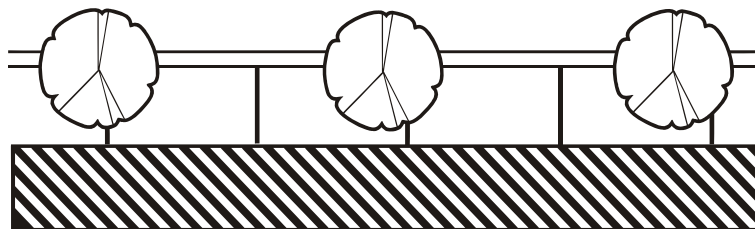
City of Vancouver Guidelines for Awning and Canopy Setbacks from Trees

Drawing 4 of 4 - Street Elevation drawing on a narrow boulevard where trees with a columnar habit are being used. Park Board specifies wider growing trees wherever space allows.



The overhang of the awning should come no closer than 120 cm to the centre of the tree trunk. Requests for awning configurations coming closer will be referred to Engineering Services - Streets Division for special consideration

Plan View



Lane Trees

While the City does not plant trees or give permission to plant trees in lanes, they nevertheless exist in many parts of the City. Most are “volunteers” that established themselves as part of natural propagation. A small number were actually planted at some point in time, by adjacent property owners and without consulting the City.

As distinct from boulevard trees, which once planted are administered by the Park Board, lane trees are also the responsibility of the Park Board.

Even though trees in lanes are not desirable with the conflicts that they can present for access and over head and underground utilities, many lane trees are still considered valuable as a part of the “urban forest” and are therefore retained. Significant trees are also often valued by local residents. For these reasons, lane tree removals must be well considered with respect to the conflict presented as well as the health and significance of the tree. Evaluation from a Park Board arborist will assesses both health and significance.

Park Board arborists will have hazard trees removed from lanes. This work is carried out by the Park Board. Trees that conflict with hydro lines are trimmed by B.C. Hydro. Removals that are required to provide access to a new development are done at the developer’s expense and can be done by the Park Board or the tree company of their choice.

Where lane trees are growing onto private property, the City does not pay for this trimming, but permission is granted the adjacent property owner to carry out the work they are looking for.

Urban Tree Pit Treatments

Before 1962 there were no street trees at all in paved commercial sections of the city. Since then a great portion of the commercial areas of the city, including the downtown core have been planted with a wide variety of species. Over the years, the Engineering Department has experimented with a number of different methods to cover the exposed soil in an effort to reduce tripping hazards and to control weed and grass infestation. Different pit covers have become the standard treatment in various precincts and neighbourhoods.

Metal grates

These are used in various designs. They are attractive, allow easy entrance for air and water and keep out most debris. However, many radial designs can pose tripping hazards especially for high heels. Where necessary, the gaps can be filled with crushed rock to eliminate this problem. This also improves the appearance as open grates can become messy with cigarette butts and other litter. There can also be weed and grass problems in the more open grate design.

Metal grates are fairly easily lifted, either by citizens or surface roots, and pushed up sections can result in an uneven surface. This can be controlled by welding the metal grate to the surrounding metal form.

Metal grates also need to be inspected and the inner rings periodically removed to avoid having the grate edge cut and girdle the expanding trunk of the growing trees.

Interlocking Pavers

An attractive treatment, they initially allow water and air to penetrate but soon develop into an impervious surface. It is difficult to remove the weeds and grass which grow between stones eventually, unless the area is very high traffic. Installation of brickwork is relatively expensive and time consuming. It is possible to readjust bricks to remove root heaves or to allow for expansion of the tree trunk. Some paver types can become slippery when wet.

Concrete Tree Surrounds

An attractive treatment that allows ornamental inserts and other precinct treatments, concrete half-moon inserts are the current tree surround standard with many new sidewalks. The tree is planted below grade, between soil and pavement, which decreases root heaves as well as reducing the opportunity for weeds in the opening. This treatment allows easy water and air access to the root zone.

Crushed rock

Initially attractive and relatively inexpensive for installation, weeds may eventually be a problem and maintenance is necessary to top up the material periodically to avoid trips. Limestone in the mix binds the rock to some extent and the alkaline result may inhibit

surface root growth from most tree species, which prefer slightly acid soil. However, the increased ph would be temporary and unlikely to harm an established tree.

Exposed Soil

More formal surround treatments such as concrete and metal will eventually be removed as the tree outgrows them resulting in exposed soil surface. Exposed soil can also be the standard tree surround, without the intermediate steps of grates or surrounds. In either case the problems with exposed soil are mainly potential surface root trips and weeds.

Rain and erosion will eventually lower the soil grade which can leave a significant lip at the edge of the planting pit. Also, in high traffic areas, soil compaction from pedestrian traffic can also result in a tripping hazard at the edge of the tree pit. Exposed soil treatment requires regular inspection and addition of soil to maintain.

Exposed soil also is very prone to weed infestation. The City's expectation that adjacent businesses will control weeds in tree pits has mixed results in various areas of the city and even on individual commercial blocks. One solution to this problem is the planting of small shrubs and flowers in the soil around the base of the tree. The Park Board supports this initiative for several reasons. The addition of flowers and greenery enhances the street. The summer watering required for the planting also benefits the street tree. Nectar and pollen producing flower will attract beneficial insects such as syrphid flies which can help control aphid infestations in the street tree. Unfortunately, it is difficult to maintain a planting bed around the base of the tree without a raised border to contain additional planting soil. The border itself can be a tripping hazard.

Metal Tree Grate Specifications

AREA	VENDOR	SPECIFICATIONS
Downtown South	Dobney Foundry	Sp 36 – 36" (915 mm)
Library Precinct	Dobney Foundry	Sp 48 – 48"(1219 mm)
Gastown		5' Round 4 pc radial
Alexander St.	Dobney Foundry	Lp60-R – 5' (1524 mm) Round 4 pc – circular pattern
Georgia Public Realm	Dobney Foundry	Sp 48 – 48" (1219 mm)
Bosa Site (Terminal & Quebec	Dobney Foundry	Sp 48 – 48" (1219 mm)
Granville Mall		5' Round 4 pc radial & 5' Square 4 pc radial

This list is intended to cover the Downtown special planning areas and will not include all metal tree grates in the City (like those covered by encroachment agreements).

The tree grates for Granville Mall and Gastown are old and we may have to look to Dobney for a close equivalent, if they need replacement.

A site inspection will still be necessary to confirm the type of grate requiring replacement.

Engineered Soils

Vancouver aims to soften the urban hardscape with ornamental trees planted on City property. However, in heavily hardscaped areas there are often inadequate soil resources on site in order to achieve a healthy tree canopy. The preparation of a resilient sidewalk subgrade requires the removal of all topsoil, the importation of cleaned gravel material, and its compaction to Engineering standards (95% modified Proctor test). The resulting material is a poor growing medium for trees, and either prevents them from growing or causes the roots to stay shallow beneath the concrete surface.

While the four piece cutout provides approximately 2 cubic meters of soil, success for the tree will only be possible if there is accessible native soil to augment available resources. In locations where native soil is not accessible, trees will not thrive or live long enough to achieve the desired effect. These situations typically occur on filled in tidal flats or places where large volumes of soil have been removed prior to the construction of a major project.

Research in sidewalk subgrade preparation has succeeded in developing a mix that reliably supports concrete sidewalks and the soil resources and rooting space required by trees. The following instructions provide an overview of the preparation and installation process. There are other materials and methodologies that accomplish the same objective. All details and specifications must meet the specific approval of City - Engineering Services and Park Board.

Sample Instructions

The 'Engineered Soil' uses large rocks (50 - 80 mm) to form the support matrix of the subgrade (similar to what is used to support rail tracks) , then incorporates topsoil into the pore spaces. This mix is intended to allow water and air to move throughout the profile, and roots to grow freely without displacing the support matrix. The topsoil within would provide nutrients, nutrient holding cation exchangers, and beneficial microorganisms.

Materials

Rock - 50 - 80 mm clear granite. Maximum aspect ratio of 1 : 1 : 2

Topsoil - Vancouver Street Tree Mix - Loamy Sand or Sandy Loams (Canadian System of Soil Classification)

Stabilizer - approved taci-fying agent

Mixing Instructions

The material is mixed in the proportion of 4 : 1 rock to soil. This will be enough soil to fill the pore spaces between the rocks while still allowing a support matrix that is

completely based upon rock. The stabilizer is applied by hand at an approximate rate of 10 kg to 40 cubic metres of mixture.

A front end loader was used to mix the material. The rock was laid down four buckets at a time, then spread out to a thickness of about 150 mm. One bucket of topsoil was first laid down on top of the four, then mixed in with a couple of passes of the loader. The stabilizer was then sprinkled on by hand. This would be repeated four or five times, then the lightly mixed material is pushed into an adjacent bin. By the time it is piled, the material appeared thoroughly mixed (more mixing occurs when the material is loaded into trucks, dumped, and spread on the site). It is recommended that a light soaking of water be sprayed onto the material during mixing in order to activate the stabilizer, though a light rain allowed us to forego this step. The material was tarped for protection from heavy rain.

Preparation and Installation

- Excavate the subgrade to a depth of 400 - 600 mm.
- Build wooden forms for the tree pits and place them prior to the laying of the subgrade. Be sure to use right-angled corners.
- For the first lift, dump half of the material into the excavated trench, spread with a backhoe, then compact with a walk behind roller. Install the second lift in a similar fashion. Bring the subgrade within 60 mm of finished level. Road mulch typical for sidewalk pours is then used to topdress.
- .Plant trees in formed pits. The forms should be left in the ground , but their bottom half should be thoroughly perforated (use a pick axe) on all the side facing the opposite the curb.



Angular granite 50 - 70 mm



Compact soil and rock mixture in two layers

Contact Information:

Dial 311 with specific details and you will be connected to the appropriate department.