Street Tree, Boulevard Plantings and Irrigation **Section 9**

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9.01 General

The landscape standards and specifications shall apply to all landscape areas within the rights-of-way (ROW) of roadways in the City of Parksville including: medians, soft landscape areas between the curbs and the ROW lines and plantings in urban plaza and sidewalk areas.

The general design and construction of the landscape shall be in accordance with the City of Parksville Standards and Specifications. Any changes to the design and construction must be approved by the Parks Foreman.

a) Street Tree and Boulevard Plantings

The design of boulevards including street tree selection and planting design shall be prepared by a Landscape Architect, registered with the British Columbia Society of Landscape Architects, to the satisfaction of the City Engineer or designate.

The plans and specifications are intended to include everything obviously requisite and necessary to complete the proper installation of the work, whether or not each necessary item is mentioned, unless otherwise specified, and the Contractor is expected to provide for same. All work specified or called for on the drawings shall be executed in accordance with all governing ordinances, laws, and regulations.

9.02 Planting Requirements and Plant Spacing

Street trees species and spacing will require approval of the Parks Foreman or designate. For boulevard planting and restoration requirements refer to Section 7.15 of this specification.

Obstruction to the line of vision is not acceptable at an intersection within the triangular area bounded by the intersection of lot lines. The maximum mature maintained height for plant materials located within sight distance triangles at intersections shall be 300 millimetres above finished grade.

Trees shall be located a minimum of two metres from the pavement, sidewalk or curb face, unless planted with a root barrier in accordance with Standard Drawing L2. Tree branches shall have five metres of clearance over traveled portion of road and two metres over the sidewalk. Trees shall be planted in accordance with Drawings RC1-RC8.

Street trees shall be generally evenly spaced 12 metres on-centre in the downtown area and 20 metres on-centre in all other areas. This spacing may be subject to alteration depending on the species used in the design. Thought should be given to spacing trees as far from light standards as possible.

9.03 Minimum Tree Planting Clearances

Listed below are the minimum distances centerline trees should be planted from (refer to Standard Drawing L2):

	metres	feet
Lamp standards	6	20
Utilities pole	3	10
Driveways	2	6
Catch basins	2	6
Waterworks	1.2	4
Sewer works	1.5	5
Corners - in line with eight metre sight triangle (see Standard Drawing L2)		
Back of curb with root barrier	1	3
Back of sidewalk with root barrier	1	3
Back of curb without root barrier	2	6
Back of sidewalk without root barrier	2	6
Hydrant	3	10
Hydro/telephone kiosks or boxes	2	6

9.04 Landscape Material Selection

Trees shall be selected such that boulevard or 'street' trees are equally distributed, and there are one to three species/cultivars on either side of the street within a given block.

All plant materials shall:

a) have the ability to withstand adverse conditions such as airborne pollutants, maximum sun exposure and reflected heat from pavements, high winds and abrasive forces, occasional snow loading and exposure to salt from road clearing operations, and if applicable, limited root zone soil volumes;

b) be hardy to Zone 7 or colder;

c) be capable of reduced water demand following a one year establishment period;

d) have relatively low maintenance attributes including: fine to medium leaf size and canopy density, low susceptibility to disfiguring or fatal diseases and infestations; infrequent demands for pruning, fertilizing and other cultural requirements; and

e) be of appropriate size and form at maturity.

All street trees shall be per Table 14.2 and shall:

a) meet the requirements of the space;

b) have the ability to withstand pruning for pedestrian, vehicle and/or building clearance without compromise to tree health or form;

c) have the absence of species/varietal characteristics of structural weakness, susceptibility to wind damage, or thin, easily damaged bark; and

d) have straight stems unless uncharacteristic for the species/cultivar.

Street tree and boulevard planting design shall complement existing plantings. Changes, if necessary, should occur at intersections. Alternative species may be considered provided that they meet the site criteria and all other criteria contained in this section. Alternative trees must be approved by the Parks Foreman or designate.

9.05 Landscape Materials

9.05.1 Soil

Topsoil for grass/planting beds/trees

Topsoil for lawn and fine grass areas shall be unamended topsoil. Topsoil for rough grass and wildflower areas shall be unamended topsoil and/or native subsoil. Topsoil for planting beds and trees shall be amended soil.

Unamended topsoil

All supplied topsoil shall be fertile, friable natural loam containing minimum four percent organic matter for clay loams and two percent organic matter for sandy loams, and it shall be capable of sustaining vigorous plant growth.

Topsoil shall be free from any inclusions of subsoil, lumps of clay, stones and roots over 50 millimetres in diameter, toxic materials, crabgrass, couch grass, blackberry, morning glory, horsetail or other noxious weeds and weed seeds.

Amended topsoil

All supplied top soil shall be fertile, friable natural loam. The soil shall be amended with at least 20 percent organic content and shall be capable of sustaining vigorous plant growth.

Topsoil shall be free from any inclusions of sub-soil, lumps of clay, stones and roots over 30 millimetre diameter, toxic materials, crabgrass, couch grass, blackberry, morning glory, horsetail or other noxious weeds and weed seeds.

Subsoil

Subsoil shall be either native subsoil, free of stones larger than 75 millimetres, or unamended topsoil. Subsoil shall be free of any toxic materials, pavements, construction debris, deleterious

materials, crabgrass, couch grass, blackberry, morning glory, horsetail or other noxious weeds and weed seeds.

9.05.2 Tree Species

The selections of tree species to be used in a development shall be made from the recommended list of street trees shown in Table 14.2 and be accepted by the Parks Foreman or designate. Should the specified tree not be available, the Parks Foreman shall be notified so that an alternate choice can be made. The developer shall not make substitutions without the approval of the Parks Foreman.

TABLE 14-2

PART 1 – Trees Directly Under Hydro Lines

Selection criterion for alternative trees not listed in Part 1:

- **Mature height not greater than 7.62 metres.**
- **All trees must be a 5 centimetre caliper, 1.4 metres above ground level at base of tree.**

SCIENTIFIC NAME	COMMON NAME
Acer griseum	Paperbark Maple
Acer ginnala	Amur Maple (tree form)
Acer platinoides 'Globosom'	Globe Norway Maple
Maackia amurensis	Amur Maackia
Malus 'Adirondack',	Adirondack Crabapple
Malus 'Golden Raindrops'	Golden Raindrops Crabapple
Malus 'Sentinel'	Sentinel Crabapple

PART 2 – Trees For Beside Hydro Lines (min. 2.75 metre lateral distance from nearest line)

Selection criterion for alternative trees not listed in Part 2:

- **Mature spread not greater than 5 metres.**
- **All trees must be 6 centimetre caliper, 1.4 metres above ground level at base of tree.**
- **Trees listed in Part 1 may also be used.**

SCIENTIFIC NAME	COMMON NAME
Acer platinoides 'Columnare'	Columnar Norway Maple
Acer platinoides 'Crimson Sentry'	Crimson Sentry Norway Maple
Acer rubrum 'Bowhall'	Bowhall Red Maple
Carpinus betulus 'Fastigiata'	Fastigiate Hornbeam
Ginkgo biloba 'Princeton Sentinel'	Princeton Sentinel Ginkgo
Fagus sylvatica 'Fastigiata' ('Dawyckii')	Fastigiate Beech
Leriodendron tuipifera 'Fastigiata'	Fastigiate Tulip Tree
Prunus calleryana "Chanticleer'	Callery Pear
Prunus sargentii "Columnaris'	Columnar Sargent's Cherry
Quercus robur 'Fastigiata'	Fastigiate English Oak
Sorbus aucuparia 'Rosedale'	Rosedale Mountain Ash
Tilia cordata 'Corzam'	Corinthian Linden

TABLE 14-2 ***(continued)***

PART 3 - Trees For Wide Boulevard or Wide Median Use Only

Trees in this Part require:

- **Minimum available root zone of 20 cubic metres per tree with a minimum width of 3.5 metres.**
- **All trees must be 6 centimetre caliper, 1.4 metres above ground level at base of tree.**
- **The lowest branch shall be 1.8 metres above ground level at base of tree.**

SCIENTIFIC NAME	COMMON NAME
All non-dwarf coniferous spp.	
Acer x freemanii 'Autumn Blaze'	Autumn Blaze Maple
Acer rubrum (sp., & full size cultivars)	
Acer trucantum 'Pacific Sunset'	Pacific Sunset Maple
Acer platanoides 'Crimson King'	Crimson King Maple
Aesculus x carnea 'Briottii'	Red Horse Chestnut
Fagus sylvatica (sp., & full size cultivars)	European Beech
Fraxinus Americana 'Autumn Purple'	White Ash
Liquidambar styraciflua	Sweet Gum
Liriodendron tulipifera	Tulip tree
Quercus coccinea	Scarlet Oak
Quercus palustrus	Pin Oak
Quercus rubra (sp., & full size cultivars)	Red Oak
Robinia psuedoacacia 'Frisia'	Golden Locust
Zelkova serrata cv.	Japanese Zelkova

PART 4 - Trees For Limited Available Soil Volume

- **(min. 4 cubic metres per tree, 1 metre pit depth)**

Trees must be approved by the Parks Foreman**.**

9.05.3 Origin

All plant material shall be nursery grown stock. Collected material is not acceptable. All plant material shall comply with the British Columbia (BC) Landscape Standard published by the BCSLA and the BC Landscape and Nursery Association (BCLNA), for container grown plants and the Canadian Nursery Landscape Association (CLNA), Canadian Standards for Nursery Stock. Where planting projects require more than 10 trees, the City of Parksville reserves the right to select and tag optimal specimens at the source or wholesale nursery.

9.05.4 Tree Form

Each tree shall have a sturdy, reasonably straight trunk, have a well-balanced branching head with the branches growing out from the stem with reasonable symmetry and shall be of uniform shape and size when planted in a boulevard row. The lowest branch shall be at least two metres high on the stem.

9.05.5 Root System

Plants shall be balled and burlapped or container-grown stock. Bare root trees are not acceptable. Container grown stock shall have a sufficiently well-established root system to hold the soil together when removed from the container. In all cases, the root system shall be strong, fibrous, free of disease, insects, defects, pernicious weeds, girdling roots or injuries and shall be sufficiently developed to guarantee successful transplantation.

All exceptions to the above standards and specifics must be approved by the Parks Foreman or designate.

9.05.6 Existing Trees

If excavation through roots is required excavate by hand, air spade or hydrovac (at low pressure as not to remove bark from roots). Roots less than 50 millimetres in diameter are to be clean cut with loppers or saw. When roots are encountered greater than 50 millimetres, the Contractor is to contact the City Arborist or designate.

9.05.7 Condition

All plant material shall be of good health and vigor with no visible signs of disease, insect pests, damage, or other objectionable disfigurements. All trees are to be inspected by the Parks Foreman or designate before planting. The design Consultant is responsible for contacting the Parks Foreman for approval prior to delivery of trees to the project site. See also Section 9.07.3.

9.05.8 Urban Trees in Sidewalks

Urban trees in sidewalks shall be selected in accordance with Table 14-2 and installed according to Standard Drawing L1 and L4. Urban trees in sidewalks shall be selected to eliminate long term above-ground and belowground conflicts with utilities, buildings and structures, and pedestrian and vehicular traffic. When alternates are proposed, the drawings shall include project-specific tree planting details showing (by plan and cross section):

a) Typical view of surrounding sidewalk, pavement, curb, above and below ground utilities, light standards, and adjacent buildings and structures.

b) Typical details of proposed rooting environment including tree pit dimensions, root barrier, subgrade scarification, drainage structure if required, topsoil mix layers or ‘horizons’, location of irrigation bubblers and pipe, and soil surface treatments, such as tree grates.

c) Typical above ground details such as staking, special appurtenances, pruning for head room etc.

9.05.9 Street Trees in Boulevards

9.05.9.1 Root barrier is required on boulevards 2.0 metres or less wide or as specified by the Parks Foreman or designate.

9.05.9.2 Street trees are to be planted in boulevards that are 1.5 metres, or greater, in width.

9.05.9.3 Trees planted two metres or less from curbs or sidewalks or other hardscape features are to have root barriers to protect civil infrastructure.

9.05.9.4 Barriers must be made commercially, produced for the purpose of deflecting roots downward, and be of a specification approved by the City of Parksville Operations Department. Placement must be as per manufacturer's instructions.

9.05.9.5 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.

9.05.10 Boulevard Trees

will not be required under the following conditions:

9.05.10.1 Where healthy boulevard street trees are growing at not less than the density or spacing requirements of this Schedule.

9.05.10.2 Where there are rock barriers or soil conditions which will not sustain a healthy tree.

9.05.10.3 Where due to the size of the boulevard area fronting the lot and the presence of driveways or other site services, there is insufficient room to plant a tree.

9.06 Landscape Installation

9.06.1 Plant Materials

All plant materials shall meet or exceed the most current edition of the BCSLA/ BCLNA Landscape Standard and as specified on the landscape construction drawings with respect to size, grading and quality. Plants shall be characteristic of the genus, species and cultivar as indicated on the construction drawings and specified herein.

All plants shall be nursery grown and shall not be pruned prior to delivery unless pre-approved by the Parks Foreman. Container stock shall have been established in the size of container

specified for at least six months prior to delivery and the roots shall not have grown beyond the limits of the container.

It is the Contractor's responsibility to verify and comply with all regulations regarding the inter-regional movement of plant material, including nursery stock, within the Province of British Columbia. Imported plant materials must be accompanied by copies of the necessary permits and import licences required by federal and provincial regulations.

Plants shall be properly proportioned; not weak, thin or elongated. Plants shall have normal, well-developed branches and vigorous, fibrous root systems. They shall be healthy and free from defects, decay, root disfigurement, sunscald injuries, abrasions of the bark, plant diseases and pathogenic organisms.
Trees shall have straight stems unless uncharacteristic for the species/cultivar. Pruning wounds shall show healthy callous growth at the branch collar without bark tearing or fungal growth. Plants exhibiting fungal staining shall be rejected.

All plant materials shall conform to the measurements specified in the drawings. Plants larger than specified may be used if approved by the Parks Foreman. The use of such plants shall not increase the contract price. If larger plants are used, the root ball shall be increased in proportion to the size of the plant. All plants shall be measured when the branches are in their normal position. Height and spread dimensions specified refer to the main body of the plant and not from branch tip to root base or from branch tip to branch tip. Where trees are measured by caliper (cal.), reference is made to the diameter of the trunk measured 1.4 metres measured upwards from the root crown.

Balled and burlapped conifers and trees in excess of three metres height must have been dug with a sufficiently large firm root ball to contain 75 percent of the fibrous and feeder root system. Root balls shall be free of invasive weeds.

A list of all plantings that were planted shall be provided to the Parks Foreman upon completion of the installation of the plant material. The list shall include plant name and cultivar, as well as the date of installation.

9.06.2 Sod

The quality and source of nursery sod shall comply with standards outlined in 'British Columbia Standard for Turfgrass Sod' published by the CLNA and the BCSLA/ BCLNA BC Landscape Standard latest edition.
At time of site delivery, the sod shall contain not more than two percent of other strains or species of grass or clovers, and no visible broadleaf weeds, and shall be of sufficient density that no surface soil is visible when mowed to a height of 38 millimetres.

The source of the sod shall be pre-approved by the Parks Foreman. Source substitutions shall not be made without the written approval of the Consultant.

9.06.3 Grass and Wildflower Seed Mixtures

Grass seed mixture quality and source to comply with standards for lawns and grass outlined in the latest edition of BCSLA/ BCLNA BC Landscape Standard BC. Seed mixtures are to be suited to the climate, terrain, establishment and maintenance conditions under which they are to grow.

Wildflower mix shall contain a blend of native and naturalized annuals, biennials, perennials and bunch grasses. Seed mixtures shall be approved by the Parks Foreman.

9.06.4 Mulch

Compost mulch at a 75 millimetre depth shall be used in all mulch applications. Other mulch materials shall only be used with the approval of the Parks Foreman. Mulch shall not be stored on paved sidewalks.

9.06.5 Planting Accessories

The following products shall only be installed when indicated in the construction drawings.

a) Tree stakes shall be a nominal 50 to 75 millimetres round pressure treated wood, or equivalent, to be pre-approved by the Parks Foreman.
b) Tensioning device shall be 19 millimetres wide, flat woven polypropylene or nylon webbing.
c) Metal tree grates shall be fabricated in the form and dimensions shown in Standard Drawing L3 and per the Approved Products List. The finish shall be powder coated black.

9.06.6 Replacements

All plant materials damaged or found not in a healthy satisfactory growing condition during the maintenance and guarantee period, or which, in any other way, do not meet the requirements of the specifications, shall be replaced at the Contractor's expense. All replacements shall be the identical species, cultivar and size to the original, as indicated in the drawings.

Where identical replacements are not available, submit a written proposal to the Parks Foreman. Approval must be obtained from the Parks Foreman prior to installation of the replacement plant materials. Replacement plants shall be maintained and guaranteed by the Contractor to the completion of the next full growing season, or the completion of the original maintenance and guarantee period whichever is later.

9.07 Tree Installation

9.07.1 Standards

Unless otherwise specified, all planting, sodding and seeding procedures are to be in accordance with the latest edition of the BCSLA/ BCLNA Landscape Standard. All pruning and planting procedures must be done to International Society of Arboriculture (ISA) Standards.

9.07.2 Scheduling and Coordination

Topsoil shall not be handled in a wet or frozen condition or in any manner in which the soil structure is adversely affected. Trees, shrubs and ground covers shall be planted only during periods that are normal for such work as determined by local weather conditions and when seasonal conditions are conducive to successful adaptation of plants to their new location.

All necessary precautions are to be taken to protect the plant material from prevailing weather conditions during transportation and planting. Planting of trees within single family residential subdivisions shall not be carried out until all building construction is at least 80 percent complete.

9.07.3 Pre-planting Inspection

Prior to the placement of topsoil and installation of plant material, 24 hours notice shall be given to the Parks Foreman or designate for inspection of the subgrade. The Parks Foreman shall be given 72 hours notice for the inspection of plant material at a single plant material assembly point. Approval of the plant material is required prior to the commencement of planting work.

Approval of plant material at its assembly point does not prevent rejection if, in the opinion of the Parks Foreman, the plant material has been damaged by an act or omission of the Contractor.

Prior to commencement of landscape work, 24 hours notice shall be given to the Parks Foreman and the project landscape supervisor shall be made available for an on-site inspection of marked locations for planting and as-built conditions and site work by others. The Parks Foreman may alter the locations of plant material in the field.

The Parks Foreman, at their discretion, may waive one or more of the pre-planting inspections, but this shall not impair the right to reject work or materials which have been damaged, or in any way do not conform to the specifications.

9.07.4 Subgrade and Topsoil

Prior to placing topsoil in planting areas, the subgrade shall be established at 150 millimetres below the finished grade for all ground cover areas and turf, and

300 millimetres below finished grade for all shrub areas. Grade transitions shall be smooth and even and shall be such that ponding cannot occur on the subgrade surface.

Debris, roots, branches, stones, building material, contaminated subsoil, visible weeds and anything else that may interfere with the proper growth and development of the planted boulevard shall be removed from the sub-grade prior to installing the topsoil.

Amended topsoil shall be installed at the following minimum depths prior to shrub planting in the boulevard: ground cover areas and turf are to be 150 millimetres and shrub areas are to be 300 millimetres.

9.07.5 Location of Plantings

Trees are to be planted no more than 12 metres apart in the downtown area and no more than 20 metres apart in all other areas. Actual tree numbers, spacing and locations will vary according to site conditions and amenities. Locations will be staked out by the engineer-of-record according to the plans and verified on site by the Works Inspector prior to planting. If underground obstructions are uncovered, these are to be reported to the Parks Foreman for resolution.

9.07.6 Planting Procedures – Trees

All trees shall be planted as per Standard Drawing L1 and L4.

a) All trees shall be planted in holes large enough to accommodate the entire root ball plus topsoil. Therefore, holes should be excavated to the diameter of the root ball plus 600 millimetres. Ensure a minimum 300 millimetre depth of compacted subgrade underneath the root ball to prevent settling of tree. The holes shall then be backfilled with topsoil to bring the plant material to the depth they were originally growing in the nursery. All trees shall be planted so that after settlement they will be at the original growing medium depth.

b) With balled and burlapped stock, the top one third of the wire frame and burlap should be folded back without disturbing the root ball. Container grown stock shall have the container removed before planting. Grow bags shall be removed or cut vertically as per the manufacturer's recommendation. The tree shall be installed plumb and faced to provide the best appearance toward the primary viewing location, as determined by the Parks Foreman.

c) Once the trees are in place, the holes are to be backfilled with amended topsoil. The holes shall be backfilled, tamped, and watered in layers to help secure the tree and eliminate large air pockets.

d) Once planted, the trees are to be securely staked using two, two metre, 50 to 75 millimetre diameter pressure treated stakes avoiding penetration of the root

system and underlying infrastructure. Secure tree to stakes with 19 millimetres wide tree tie attached to each stake with a shingle nail.

e) Unless otherwise indicted in the construction drawings, place 75 millimetres of compost mulch over soil surface.

9.07.7 Planting Procedures - Trees in Sidewalks

a) All trees to be located in sidewalks shall be planted and centered within a 900 millimeter diameter hole pre-formed in the concrete sidewalk, complete with concrete tree barrel. The said hole shall be covered with an ornamental tree grate in accordance with Standard Drawing L3 and L4 flush with the surface of the finished sidewalk. The offset of the centre of this planting hole to the back of the curb face shall be 650 millimetres.

9.07.8 Planting Procedures - Boulevard Plantings

a) All plants for boulevard planting areas shall be delivered to the site and protected from sun and drying winds. Plants that cannot be planted immediately on delivery shall be kept well-watered. New plants shall not remain unplanted for longer than three days after delivery.

b) Plants shall be set plumb in the planting beds or planting pits, except where the plant's character requires variation from this.

c) Growing medium shall be placed in layers around the roots or ball, preferably by hand. Each layer shall be carefully tamped so as to avoid injuring the roots or ball, or disturbing the position of the plant.

d) Upon completion of boulevard planting, the soil shall be raked to remove any debris brought to the surface by the planting operations. After raking, the planting area shall be mulched with 75 millimetres of compost mulch placed in an even layer over the soil surface, or as directed by the City Engineer.

e) Once planting and mulching are completed, the site shall be cleaned of all excess soil, rock, and debris.

9.08 Turf Installation

9.08.1 Cutting, Shipping and On-site Handling of Sod

Shipping and placement of sod shall be coordinated to minimize the time lapse between shipping and laying. Sod shall be delivered to the site within 24 hours of being lifted and installed within 36 hours of being lifted. During transportation sod shall be protected against drying. Sod shall be kept moist and cool in the event of any delay in laying.

During dry weather, water sod as necessary to ensure its vitality and prevent soil and root loss during handling. During wet weather allow sod to dry sufficiently to prevent tearing during lifting and handling.

9.08.2 Sod Scheduling and Workmanship

Keep the site well drained. Sod placed between May 15 and September 15 shall require installation of an automatic irrigation system or may be manually watered with written permission by the City Engineer. Clean up immediately soil or debris spilled onto pavement and dispose of deleterious materials.

9.08.3 Laying of Sod

Excavate and/or fill and prepare subgrade to a sufficient depth below finish grade to accommodate 150 millimetres minimum topsoil plus the thickness of the sod.

The top 75 millimetre surface of subgrade shall be scarified to produce an even, loose-textured surface free of stones larger than 75 millimetres. Remove and dispose of all roots and branches and all plant parts of blackberry, horsetail, morning glory, Canada thistle or other noxious weeds. Remove and dispose of all paving materials, tar, building materials or other deleterious substances.

The Contractor shall inform the City Engineer of any existing subgrade conditions which will adversely affect the work in this section. The finished subgrade shall be approved by the City Engineer prior to placement of topsoil.

Spread topsoil evenly over the approved subgrade to a minimum depth of 150 millimetres and compacted to maximum 85 percent modified dry density. Immediately prior to sod placement, the finished topsoil grade shall be smooth, firm against footprints, with a fine loose-texture. Topsoil shall not be placed when in a wet or frozen condition.

Lay sod in rows, perpendicular to slope, smooth and even with adjacent areas and surfaces, and with joints staggered. Butt sections closely without overlapping or leaving open joints between pieces. Water immediately after sod laying to obtain moisture penetration through sod into the top 100 millimetres (four inches) of topsoil mix.

9.08.4 Hydroseeding

Hydroseeding shall be applied with the approval from the City Engineer.

9.08.5 Erosion Control Blanket

Prepare area and seed. Apply blanket over designated areas and anchor blanket in accordance with manufacturer’s recommendations which are to be used as the minimum standard to ensure that the blanket is applied and held down to maintain firm contact.

9.09 Plant Maintenance

The Applicant is responsible for all necessary maintenance of the plant material for one year from the date of issuance of the Certificate of Substantial Completion. This shall include any procedure necessary to maintain all plants in a healthy growing condition, such as watering, fertilizing, weeding, pruning, replacement of plants as required and treatment for disease and pests. All planting beds shall have all weeds removed at least once per month during the growing season, by hand pulling or hoeing. All plant material is to be deep watered as often as required to ensure that no stress occurs to the plants during hot weather (as often as twice per week in hot weather). Maintenance for all turf areas shall include watering, mowing, weeding, topdressing and reseeding as required.

The use of the City water system for plant watering may or may not be permitted depending on water restrictions in effect at the time. The Contractor is required to approach the Operations Department for a 'Hydrant Use Permit' prior to using any City hydrant as a water source.

9.10 General

The irrigation standards and specifications shall apply to all landscape areas within the rights-of-way (ROW) of roadways in the City of Parksville including: medians, soft landscape areas between the curbs and the ROW lines, and plantings in urban plaza and sidewalk areas.

The general design and construction of the irrigation system shall be in accordance with the City of Parksville Standards and Specifications. Any changes to the design and construction must be approved by the Parks Foreman.

9.11 Irrigation

Whenever it is deemed necessary through development or subdivision approval to irrigate boulevards and landscaping (parks and downtown core and mixed use edge sidewalk trees and hanging baskets), the provisions of this section shall apply. Irrigation design shall be prepared by a certified Irrigation Designer registered with the Irrigation Industry Association of British Columbia (IIABC) or Landscape Architect, registered with the British Columbia Society of Landscape Architects (BCSLA).

All irrigation installation shall be per the most current IIABC standards for landscape irrigation systems. All irrigation work shall be completed by a suitable, experienced and qualified irrigation contractor with trained and competent staff adequate for the scope of the work. Utilizing staff certified by the IIABC in such disciplines as Certified Irrigation Technician (Level 1 or 2), Certified Designer (Commercial or Residential), Certified Irrigation Scheduler, etcetera are recommended. The contractor shall be a member in good standing of the IIABC and have met the qualification standards currently applied to contractors by that organization. The location of the irrigation system components shall be determined by the Parks Foreman.

Irrigation Systems

Automatic irrigation controllers shall be as per the approved products list and shall provide all the necessary features for programming as shown on the irrigation design plan. Each controller must be encased in a sturdy, lockable, weatherproof mounting box and must be easily accessible for maintenance. All irrigation controllers must be CSA approved and serviced by a permanent hydro connection from an approved source. Irrigation control valves must be compatible with the type of controllers installed.

Irrigation systems for large, high demand uses such as public parks, sports fields, etc., shall be designed to operate under the City's remote irrigation control system. Such designs shall be established through consultation with the City of Parksville Operations Department.

In some instances battery operated controllers will be accepted by the Parks Foreman or designate.

Irrigation designs shall take into consideration the latest upgrades to the Sentinel Control System. All irrigation needs must consider connecting to the Sentinel System as a first priority.

9.12 General Irrigation Design Requirements

Downtown

1. Landscape in medians shall be irrigated.

2. Grassed boulevards fronting institutional, commercial and multi-family lots with potential for heavy pedestrian traffic between the curb and sidewalk shall be irrigated. Low traffic grassed boulevards may be installed without irrigation. Regular maintenance and manual watering of a low traffic grass boulevard are required by the property owner in perpetuity. The final decision regarding irrigation requirements for grass areas shall be made by the City Engineer or designate.

3. Boulevard trees, shrubs, hanging baskets and ground covers shall be watered from an automatic irrigation system. Trees, beds, permanent planters, hanging baskets and turf must be on separate zones from each other allowing for isolation.

4. Urban trees in pavement shall be irrigated with tree bubblers on swing joints.

5. Hanging baskets shall be irrigated with two drip emitters per basket (see Standard Drawing L5).

6. Approved irrigation controllers (see Approved Products List), complete with flow sensors and master valves are to be used. Whenever possible, connection shall be made to an existing Sentinel Central Control controller or approved equal. Wireless attachment to the Sentinel Central Control may be considered as a secondary choice to hard wired. Irrigation controllers shall be approved by the Parks Foreman or designate prior to installation.

All other areas

1. Irrigation system requirements for designated park space are to be determined by the Parks Foreman or designate.

2. Grassed boulevards fronting institutional, commercial and residential uses with potential for heavy pedestrian traffic between the curb and sidewalk shall be irrigated. Low traffic grassed boulevards may be installed without irrigation, but manual watering for establishment and maintenance is required by the property owner in perpetuity. The Parks Foreman's or designate's decision on irrigation requirements for grass areas shall be final.

3. Sentinel custom control satellites or approved equal, complete with flow sensors and master valves are to be used on sites with 12 or more zones.

4. Sites with less than 12 zones must use a commercial grade, CSA approved controller as per the approved products list, complete with master valve and rain sensor shutoff controls or approved equal. Preference shall be given to systems that connect to Sentinel Central Control.

5. Irrigation controllers must be serviced by a permanent hydro connection from an approved source.

9.13 Irrigation System Parameters

Irrigation shall be designed with a maximum design flow velocity of one and a half metres per second (five feet per second). All pipes and valves shall be sized for minimum friction loss. The irrigation design shall include head to head coverage for turf and shrub areas. Lawn, shrub and hanging basket plantings shall be irrigated by separate zones which should be further separated by aspect (i.e.: north & east and south & west) and elevation. Sprinkler zones shall be designed with matched precipitation rate nozzles (nozzles shall not be mixed with varied precipitation rates on the same zone) and designed to minimize elevation changes within the zone. Specify low precipitation rate nozzles for sloping areas and use check valves to eliminate low head drainage.

Sprinkler zones shall be designed to have pressure uniformity with a maximum pressure difference of 15 percent. Where surface sprinklers are used, ensure unobstructed sprinkler coverage to tree bases from at least two sides. The location of pop-up sprinklers must consider the related plant material and its growth potential and interfering landscape features. The locations shall provide optimum coverage for as long as possible.

Every drip irrigation zone shall be designed with a filter, pressure regulator and flush valve. The drip component manufacturer's instructions for installation of drip equipment and maintenance shall be included in project specifications.

Overspray shall be minimized on paved surfaces hardscapes and buildings. Irrigation systems shall be maintained and repaired for the duration of the maintenance period, this includes but is not limited to, winterization, spring start-up and backflow testing as required for the duration of the maintenance period. Failure to maintain the system in a timely manner may result in holdback funds being used by city staff to complete the task. The system design must make the water connection and all the system components safe from winter freezing damage and include the installation of a blow-out point after (downstream) the backflow assembly that is convenient for purging the system of water.

Wireless rain sensors shall be provided. They shall be capable of shutting off the system in case of rain. All irrigation components shall be from a coordinated manufacturer's line listed in the Approved Products List.

9.13.1 Irrigation Scope

Irrigation work includes supply of all materials, labour and equipment to install a complete and operational irrigation system as specified herein and as shown on the construction drawings including:

1. Excavation, piping, valves, heads, nozzles, drip emitters and devices, controller, complete installation, testing, maintenance, adjustment and guarantee of the system.

2. Water point of connection and backflow prevention including supply, excavation and installation.

3. 110 VAC and low voltage electrical wiring including supply, excavation and installation.

4. Restoration of all existing landscape areas to a condition equal to or higher than prior to commencement of work on-site, to the satisfaction of the Parks Foreman.

9.14 Irrigation Materials

Acceptable products can be found in the City of Parksville's Approved Products List. The products shall be in new condition with the size, manufacturer and features shown in the design. The developer shall not make substitutions without the approval of the Parks Foreman.

9.14.1 Irrigation Backflow

A double check valve backflow assembly is required at the point of connection of all irrigation systems. Whenever an irrigation system is to be fitted with a fertilizer injector, a reduced pressure backflow assembly will be required at the connection point of the system.

All backflow assemblies shall be approved in the most up to date list of approved backflow prevention assemblies published by the Foundation for Cross Connection Control and Hydraulic Research, a division of the University of Southern California. The device must be tested by a certified backflow assembly tester upon installation, after relocation, repairs and at least once per year in accordance with the latest edition of Standard CAN/CSA – B64.10 "Manual for the Installation, Maintenance and Field Testing of Backflow Devices".

9.14.2 Low Voltage Field Wire

Control wires must be sized to the length of the proposed run, of the zone control valves being wired, using the recommendations of the manufacturer.

Field wires from controller to automatic valves shall be CSA approved direct burial, minimum #14 AWG TWU -40. Only white shall be used as a common. Other colours shall be consistent from controller to valve.

All wiring shall be protected by being bundled and taped at three metre intervals. The wiring shall be installed beneath the irrigation piping or in an appropriate sized conduit run independently.

Spare wire must be available at each valve manifold. All electrical splicing shall be made with waterproof marettes and shall be placed in a minimum 250 millimetre round valve box. Sufficient extra wire shall be left in each valve box such that the splice may be lifted 300 millimetres above grade. Extra wire is to be neatly coiled.

9.14.3 Irrigation Controller

All controllers, complete with rain sensors, must be CSA approved, suitable for their mounting location and sufficiently flexible to allow for and encourage optimal operation of the designed system in all circumstances. Controllers shall be encased in a sturdy metal, lockable, weatherproof mounting box and must be easily accessible for maintenance. All controllers shall be installed following the recommendations of the manufacturer.

Controllers for downtown shall be designed to operate under the City's remote irrigation control system. Central Control Units in all other areas, when deemed necessary by the Parks Foreman, shall also be designed to operate under the City's remote irrigation control system. Such designs shall be established through consultation with the City of Parksville Operations Department.

9.14.4 Electric Solenoid Valves

All control valves shall be in new condition and shall have the size, manufacturer and model numbers displayed. Manufacturer's recommendations shall be followed in the selection and application of each control valve being used. All valves shall be the size, make and model shown on irrigation construction plans.

9.14.5 Sprinkler Heads

All sprinkler heads shall be selected to consider safety, maintenance, risk of vandalism and appearance on site. Sprinklers must be suitably adjustable and located so as to keep water within the landscaped area and minimize overspray. All sprinkler heads should be mounted on a swing joint equal in size to the sprinkler head inlet. Teflon tape must be used on all threaded fittings. Every sprinkler head shall come with a factory installed check valve and pressure regulator.

9.14.6 Valve Boxes

All in-line valves shall be grouped wherever possible and installed in valve boxes specified in the Approved Products List. The valve box shall be sized to accommodate the number of valves grouped in a manifold with allowance for room to service the valves, with a minimum of

75 millimetre clearance. All solenoid valves must be installed in a minimum #1419 valve box, bolted down with the top of the box flush with finished grade.

- #1419 – Maximum two 1 ½ inch or three 1 inch solenoid valves
- #1220 – Maximum three 1 ½ inch or four 1 inch solenoid valves

Valve boxes shall be supported so as to be able to bear the weight of expected traffic.

9.14.7 PVC Pipe and Fittings

All polyvinyl chloride (PVC) pipe and fittings must be marked as to size and class, and their pressure and strength rating must exceed that of one and one half times the working pressure. All PVC pipe shall be schedule 40 PVC, unless otherwise approved (i.e. drip line for baskets). All plastic fittings shall be a minimum of schedule 40 PVC molded fittings and shall be suitable for solvent welding or threaded connections. Fittings for polyethylene pipe may be compression style or insert fittings at least equal to the pipe size used, complete with stainless steel, approved clamps.

9.14.8 Swing Joint Assemblies

Swing joint assemblies for turf type sprinkler heads shall consist of three schedule 40 street elbows (MIPT x FIPT) and 1 schedule 80 nipple (size as required).

9.14.9 Solvent Cement and Thread Seal Tape

Solvent cement and primer shall be of a type recommended for the PVC pipe class, schedule and maximum size. The Contractor shall ensure that the shelf life of the cement, as labelled by the manufacturer on the container, has not expired.

Non-solvent lubricant tape (such as Teflon tape) must be used on all threaded fittings. Pipe dope is not an acceptable alternative.

9.14.10 Irrigation Casing Sleeves

Irrigation sleeves under sidewalks, driveways and road paving shall be installed prior to the construction of the paving or other hard surfaces. Sleeves to be at least series 160 PVC pipe, with ends capped until such time as irrigation pipe is installed. Sleeves shall be sized to be twice the size of the carried pipe. On a main line, two sleeves may be used, one for the main line, another for the control wires. The Contractor shall be responsible for locating all sleeves.

9.15 Irrigation System Installation

9.15.1 Existing Conditions

Ensure that existing site features and improvement areas are disturbed as little as possible. Protect existing vegetation throughout installation and do not damage root systems. Return all areas to condition prior to construction immediately after irrigation installation and testing.

Prior to excavation, the Contractor shall review the finished grade elevations and density of compaction in existing lawn and planting areas, and ensure the restoration of disturbed areas to grades and compaction levels that match existing areas.

Existing sod removed to accommodate irrigation installation shall be preserved in a healthy condition and replaced subsequent to installation and backfilling, or replaced with new sod.

9.15.2 Delivery and Storage

Shipping, handling and installation of materials shall be to manufacturer's recommended instructions and be of the best workmanship. Particular care shall be taken to avoid scratches and nicks on the plastic pipe. Pipe must be appropriately stacked and stored in a clean place on the site, keeping dirt out of the pipe at all times.

9.15.3 Workmanship

Layout work as accurately as possible to the construction drawings. Install swing joints, offsets and all fittings to bring the pipe and heads to the location shown.

If drawing or field adjustments to the design are made, the Contractor shall be responsible for full and complete irrigation distribution and coverage of all irrigated areas.

A written guarantee of the installed system shall be provided to the City of Parksville covering workmanship and materials for one year.

9.15.4 Backflow Prevention

A backflow prevention device must be provided at the point of connection to the potable water system. The device must meet or exceed local and provincial codes governing cross-connection and be tested by a certified backflow assembly tester. Certified testing certificates must be submitted to the Parks Foreman.

The location of the backflow preventer and its installation is critical and must be in accordance with the plans and installation details or as directed by the Parks Foreman.

9.15.5 Water and Electrical Service Connection

Water service connection shall be in accordance with Section 6.0 – Water Distribution Systems, and as shown on the construction drawings. Contractor shall have a qualified electrician connect the controllers to the electrical supply.

9.15.6 Control Equipment

All automatic valves and controllers shall be installed following the recommendations of the manufacturer of said equipment.

9.15.7 Sprinkler Heads, Valve Boxes, Drains

Install all sprinklers, valve boxes and drains according to the City of Parksville Engineering Standards and Specifications and manufacturer's specifications. All valve boxes, drain boxes or any other miscellaneous marker or access boxes shall be installed so that the top of said structure is at finished grade.

9.15.8 Excavation and Trenching

The Contractor shall exercise reasonable care to avoid causing damage to any and all underground utilities and structures. If necessary, restore all surfaces, existing underground installations, etc., damaged or cut as a result of the excavations to their original or better condition and in a manner approved by the Parks Foreman.

For large turf installations, the minimum depth of cover for pipe 100 millimetres or smaller shall be 450 millimetres. Minimum depth of cover for pipe 150 millimetres or larger shall be 600 millimetres. For residential and small commercial installations, a minimum cover of 300 millimetres is acceptable. In existing sod areas, sod shall be removed, preserved and replaced once backfilling is complete.

Bedding material shall be well-graded sand, with a minimum cover of 75 millimetres on all sides of the irrigation pipe. Backfill material shall be free from rocks, large stones and other unsuitable substances which could damage the pipe or create unusual settling problems.

When trenching through existing asphalt roadways, the Contractor shall cut the asphalt to the width of the trench prior to trenching. Removal and replacement of all asphalt shall be the responsibility of the Contractor.

The Contractor shall exercise reasonable care to avoid causing damage to any and all underground utilities and structures. The replacement and repair of damages caused by construction shall be the responsibility of the Contractor.

9.15.9 Pipe Line Assembly and Installation

Do not drag pipe along ground whether single lengths or assembled sections. Damaged pipe shall be rejected and replaced by new pipe and couplings. Keep pipe clean at all times, blow out with compressed air or water on completion of assembly.

Pipe and fittings shall be thoroughly cleaned of dirt, dust and moisture before applying solvent. Pipe may be assembled and welded on the surface. Snake pipe slightly from side to side to allow for expansion.

No irrigation line shall be installed so that it runs parallel and directly over another such line or utility. Leave minimum clearance of 50 millimetres (two inches) between irrigation lines laid in a common trench.

9.15.10 Flushing, Inspection and Testing

Thoroughly flush out all water lines before installing heads, nozzles, valves and other hydrants. All laterals and mains that are to be stubbed for future connections shall be isolated with accessible valves and either blown out or drained of pressure test water prior to the installation of the final caps and backfilled.

Upon completion of the irrigation system all pressure regulation, arcs, distances of throw, sprinkler locations and height, controller zones, etcetera must be adjusted so as to optimize the operation of the system and make it ready for inspection and testing.

Inspection will be carried out by the Parks Foreman to ensure that the work has been done in a neat and professional fashion and meets the intent of the installation standards previously agreed on, in all important aspects.

Testing will require that the system be operated sequentially with the controller, in the presence of the owner's representative. The purpose of the test is to ensure that the system covers the landscape to be irrigated and meets the design criteria. There are no circumstances under which the system mainline should be subjected to the application of compressed air as a static pressure test.

Any deficiencies noted during the inspection and testing will be rectified promptly and signed off by the Parks Foreman.

9.15.11 Permits and Fees

All permits shall be obtained and required fees shall be payed to any government agency having jurisdiction over the work. Inspections required by local ordinances during the course of construction shall be arranged as required. Upon completion of the work, satisfactory

evidence shall be provided to the Parks Foreman to demonstrate that all work has been installed in accordance with the ordinances and code requirements, including all applicable certificates.

9.15.12 Standards

Work shall be in accordance with mechanical (plumbing) and electrical standards, codes and regulations including the following:

1. Current CSA and ASTM Specifications for pipe and fittings.
2. The British Columbia Plumbing Code.
3. British Columbia Landscape Nursery Association (BCLNA)
4. Irrigation Industry Association of British Columbia (IIABC)

9.15.13 End of Maintenance Period

Notify the Parks Foreman 30 days in advance of the end of the maintenance period.

9.15.14 Reference Standards

Reference standards for landscape maintenance shall include project specifications and the most recently amended version of the following:

(a) British Columbia Society of Landscape Architects (BCSLA) / British Columbia Landscape & Nursery Association (BCLNA), British Columbia Landscape Standard
(b) International Society of Arboriculture Pruning Guidelines
(c) Federal and Provincial Legislation
(d) *Pesticide Control Products Act*
(e*) Pesticide Control Act* and Regulations
(f) *Weed Control Act* and Regulations
(g) *Worker's Compensation Act* and Regulations
(h) Irrigation Industry Association of British Columbia (IIABC)