

1. GENERAL

1.1 Submittals

- .1 Provide the Consultant with written documentation indicating original nursery and place of growth and sources of supply for all shrubs intended to be used when directed.
- .2 Samples of planting accessories when directed by Consultant, including product data.

1.2 Inspection by Consultant:

- .1 The Consultant will inspect plants at the following stages:
 - .1 Plants at local source of supply or place of growth in Alberta.
 - .2 Proposed plant locations before excavating.
 - .3 Installed plants before commencement of maintenance period.
 - .4 At end of maintenance period.
- .2 Notify Consultant 72 hours in advance of each required inspection. Contractor shall ensure required plants will be available or meet specifications before arranging inspection for selection and tagging of plants.
- .3 Consultant may flag trees with Contractor at nurseries to pre-approve plant material.
- .4 Any materials damaged during transportation, or not meeting minimum requirements as outlined in Nursery Procurement section will not be accepted by Consultant. This material will be removed from "approved materials" list.
- .5 Approval of plants at source of supply does not impair the right of Consultant to inspect plants on site during project construction. Any plant that has been damaged, does not conform to specifications, or where Consultant installed tags are missing, will be rejected.

1.3 Delivery, Storage and Handling

- .1 Handle plants with reasonable care and skill to prevent injuries to trunk, branches, roots, rootballs and containers. Trees with damaged, broken or abraded trunks or branches will be rejected.
- .2 Protect plants during shipment with tarpaulin, windscreen or other suitable covering. Carefully tie in all branches before transporting. Take all precautions to prevent excessive drying from sun and wind and breakage from wind and equipment. Pad all points of contact between plant and equipment.
- .3 Provide adequate site protection to rootballs, roots, trunks, branches and leaves of plants from drying, frost, equipment, breakage, vandalism and other damage.
- .4 Install plants within 24 hours of delivery to site. Store and heel plants in with topsoil or mulch in suitable location when planting cannot be completed on time. Keep all plants moist until planted. Plants not planted within required timeframe, weather permitting, may be subject to rejection.
- .5 Do not install plants whose soil balls have been cracked or broken before or during planting or when burlap ropes required in connection with their transplanting have been removed. Do not use plants damaged during contact with equipment, or plants that are wilted, windburned or stressed.
- .6 Replace damaged or rejected plants at no cost to Consultant.

- .7 Do not transport trees in open trucks when the temperature is in excess of 25oC, or at speeds in excess of 60 km/h.

1.4 Warranty

- .1 Replace plants immediately when found dead or not in healthy and satisfactory growing condition during maintenance/warranty period specified in Exterior Landscape Maintenance Section.

1.5 Maintenance Period

- .1 Maintain plants as specified in Exterior Landscape Maintenance Section.

1.6 Measurement and Payment

- .1 Excavation + Disposal: For tree wells and planting beds, to depths specified in Drawings. Payment shall be per cubic meter and shall include all work and material incidental thereto.
- .2 Planting Medium: For tree wells and planting beds, payment shall be by the unit price per cubic meter and shall include all work and materials incidental thereto.
- .3 Trees: Payment shall be by the unit cost per tree, and shall include all costs for the supply, loading delivery and installation of the plant material and the supply and installation of guying, and all other work and materials incidental thereto.
- .4 Shrubs: Payment shall be by the unit cost per shrub, and shall include all costs for the supply, loading delivery and installation of the plant material and the supply and installation of guying, and all other work and materials incidental thereto.
- .5 Bark Mulch: For tree and shrub areas, payment shall be by the unit price per square metre for the specified depth for supply and installation and shall include all work and materials incidental thereto.

2. PRODUCTS

2.1 Plants - General

- .1 Supply nursery grown plants that are grown in Alberta or Prairie province.
- .2 Supply plants conforming to federal and provincial regulations.
- .3 Nursery Grown Plants:
 - .1 All plants shall be No. 1 Grade, nursery grown, specimen quality, under proper cultural practices with respect to fertile soil, ample spacing, regular cultivation, weed, pest and disease control, adequate moisture and pruning in accordance with good horticultural practices as advocated by the Canadian Nursery Trades Association and the Landscape Alberta Nursery Trades Association.
 - .2 Plants true to genus, species and variety, structurally sound, well balanced, healthy, vigorous, of normal growth habits, densely foliated and healthy well-developed root system.
 - .3 Trees with multiple leaders, unless specified, will be rejected. Trees with a damaged or crooked leader, bark abrasions, sunscald, disfiguring knots, insect damage or

cuts of limbs over 20mm in diameter that are not at least 50% closed will be rejected.

- .4 Plants free of disease – specifically including Dutch Elm Disease and Black Knot, insect infestations, insect eggs, rodent damage, sunscald, frost cracks and other abrasions or scars to bark.
- .5 Heeled-in plants or plants from cold storage will not be accepted.
- .6 Plants which have been top-worked, unnaturally sheared or colour treated are not acceptable.
- .7 Plants from native stands, orchards, wood lots, neglected nurseries or which have not received proper cultural maintenance are not acceptable.

2.2 Plants - Characteristics

- .1 Deciduous Trees: straight bodied trees according to their natural habit of growth. Double leaders not acceptable. Trunks clean and free of stubs, decay, splits or other damage.
- .2 Coniferous Trees: trees having straight central leaders with dense and uniform branching that begins no higher than 200 mm from base of tree. Double or broken leaders not acceptable.
- .3 Multi-stemmed Trees: with three or more main stems originating from common base at ground line.
- .4 Shrubs: natural form, typical of genus, species and variety; minimum of four canes.

2.3 Plant Measurement

- .1 All plants shall conform to measurements specified in plant list.
- .2 Measure trees and shrubs, in centimetres, with branches in their normal positions.
- .3 Height and spread dimensions, in centimetres, specified refer to main body of plant.
- .4 Caliper size, in millimetres, takes precedence over height. Take caliper measurement 30 cm above ground.
- .5 Supply container grown plant in container size indicated on plant list. Plants supplied in smaller than specified container will be rejected.

2.4 Plants – Soil Balls

- .1 Container grown plants:
 - .1 Grown in containers for minimum of three months.
 - .2 Established root system that will "hold" soil when removed from container.
 - .3 Container sized in proportion to plant size.
 - .4 Root bound plants are not acceptable.
- .2 Balled and burlapped plants:
 - .1 Soil balls tightly secured with burlap, heavy twine and rope, or burlap wire baskets and rope. Plant trunks shall be in centre of the root ball.
 - .2 Protect balls against exposure to elements.
 - .3 Deliver with firm natural ball of soil and free from pernicious perennial plants and their roots.

.3 Minimum ball sizes for nursery grown deciduous trees:

Caliper (mm)	Min. Ball Diameter (cm)
40	60
50	70
60	70
70	80
80	90
90	90
100	100
125	120
150	150
175	175
200	200

.4 Minimum ball sizes for nursery grown coniferous trees:

Height (cm)	Min. Ball Diameter (cm)
100	45
125	50
150	60
175	70
200	80
250	90
300	122
350	127

.5 Adjust ball size according to growing habits of plants. Listed soil ball sizes are minimum and for use on nursery grown trees under proper nursery conditions. Multi-stem trees and pine trees require soil ball minimum two sizes larger.

.6 Ball size shall be sufficiently large to contain at least 75% of fibrous root system with a ball depth not less than 50% of ball diameter.

2.5 Planting Medium and Peat Moss:

.1 Planting medium: fertile natural loam, capable of sustaining healthy growth, loose and friable, free of subsoil, clay lumps, stones in excess of 20 mm, live plants, roots or any other deleterious material greater than 20 mm diameter. Planting medium shall be free of litter, foreign matter and toxic materials harmful to plant growth. Planting medium

containing construction debris, sod clumps, quack grass or other noxious weeds is not acceptable. Planting medium supplied to site shall meet the following requirements:

- .1 Minimum 6% organic matter.
- .2 Acidity/alkalinity shall range from 5.9 pH to 7.0 pH.
- .3 Electrical Conductivity (E.C.) - level of soluble salts shall not exceed 1.5 dS/m.
- .4 Texture: "Loam" in accordance with Canadian System of Soil Classification. Planting medium shall fall within an allowance of $\pm 2\%$ of the values stated in the table below:

Soil	Sand (%)	Silt (%)	Clay (%)	Class
Loam	35	35	30	Loam

- .2 Peat Moss: decomposed plants, fairly elastic and homogeneous, free of decomposed colloidal residue, wood, sulphur and iron. Minimum of 80% organic matter by mass, pH value between 4.5 and 6.0. Furnished in an air-dry state, packed in standard bags or bales showing name of manufacturer.

2.6 Water

- .1 Water: clean water free of contaminants that may inhibit germination and tree growth.
- .2 Water for water hauling equipment: supplied and paid for by Contractor.

2.7 Plant Accessories

- .1 Support posts: T-rail studded 40 mm x 40 mm metal stakes, minimum 2.1 m long.
- .2 Guy wire: #12 or #14 pliable galvanized steel wire.
- .3 Guy wire anchors: T-rail metal stakes, minimum 600 mm long.
- .4 Bark protector: two ply reinforced black rubber garden hose 12 mm diameter, 75 mm wide fabric webbing or rubber belting and as directed by Consultant.
- .5 Flagging: fluorescent orange flagging tape.
- .6 Plant protection: materials to protect plants from rodent, animal and sun damages applied according to manufacturer's instructions:
 - .1 Galvanized wire mesh and fastener extending 600mm up trunk from finish grade.
 - .2 Chemical repellent treatment containing thiram (fungicide) mixture.
 - .3 Perforated spiral plastic strip extending 600mm up trunk from finish grade.
- .7 Mulch material: Coniferous wood mulch: shredded mulch from cedar, fir or pine bark, varying in size from 25 to 100 mm in length. Mulch shall be free of non-organic materials, wood preservatives or diseased wood.

3. EXECUTION

3.1 Preparation

- .1 Locate and stake locations of electrical services, utility lines and other underground obstructions.

- .2 If underground services interfere with planting plan, notify Consultant, stop Work in area and await further instructions.
- .3 Stake out locations of trees, shrubs and planting beds. Locations of all plants shall be reviewed and approved by Consultant on site before planting. Plants installed without review and approval may require transplanting or relocation as directed by Consultant at no additional cost.
- .4 Protect benchmarks and hubs which form part of legal site survey.

3.2 Preparation of Plant Beds and Planting Areas

- .1 Shrub Beds: excavate plant beds minimum of 600 mm deep. Utilize excavated material on site, if possible or dispose offsite according to local regulations.
- .2 Trees and Specimen Shrubs: excavate plant pits large enough for soil ball and 300 mm around and beneath soil ball. Excavate tree planting beds minimum 600 mm deep.
- .3 Do not excavate plant pits unless trees are scheduled for installation the same day. Cover and/or clearly flag all excavated plant pits left unattended for any length of time that may present a hazard.
- .4 Place soil mix in planting beds to required elevations. Slope grade away from building.
- .5 Install filter cloth over prepared plant beds only where indicated on drawing.
- .6 Install edging material according to manufacturer's instructions or detail at edge of plant beds where indicated on drawings.

3.3 Planting

- .1 Scarify sub-grade soil within tree pit to depth of 100 mm to eliminate glazed walls before placing soil. Cover bottom of each tree pit excavation with minimum of 300 mm of soil mix and firmly tamp.
- .2 Trees should not be lifted by their trunks. Lifting should be by attachment to the basket at three to four points, or by supporting the tree below the rootball. Trunks shall be supported as necessary to hold them in relation to the rootball and to prevent tearing of roots or loosening of the rootball. Support shall be such that the cambium is not damaged.
- .3 Place plants at same depth they were originally grown. Face for best appearance.
- .4 Measure minimum depth of plant pit from downward side of slope when planting on incline.
- .5 Container plants: remove containers and keep soil ball intact while placing plant in pit. Where roots have circled the container, gently loosen outside roots before planting.
- .6 Balled and burlapped plants:
 - .1 Keep burlap and twine intact while placing plant in pit.
 - .2 Tamp soil mix around ball in layers of 150 mm eliminating air voids.
 - .3 When 75% of soil mix has been placed fill hole with water.
 - .4 After water has completely penetrated soil cut and fold burlap from top third of root ball before placing final layer of soil mix.
 - .5 Remove all ropes, wires and binding from top third of root ball.
 - .6 Complete backfilling, build 100 mm high soil lip around outer edge of plant pit. Fill with water and allow it to be absorbed. In sodded areas, install trees with slight depression to create required saucer.

- .7 Fill watering saucer with bark mulch to 75 mm depth. Keep mulch material away from trunks and stems.
- .8 Place bark mulch to 75 mm depth over plant beds. Keep mulch material away from trunks and stems.
- .9 Do not install any plants closer than 750 mm to edge of walkways, driveways or building foundations. Consider proximity to buildings and walks when installing trees.

3.4 Supporting Trees

- .1 Support trees immediately after installation.
- .2 For trees under 300 cm in height use two support posts. Place one support on prevailing wind side of tree and one support directly opposite.
- .3 For trees 300 cm in height and over use three support posts. Space posts equally around tree.
- .4 Anchor support post minimum 600 mm into undisturbed ground. Ensure support post is secure and vertical. Replace all damaged support posts.
- .5 Locate support posts away from trunk and branches. Height of support shall correspond with tree height.
- .6 Provide each tree support with a bark protector and tie secured at approximately 60% of tree height. Keep ties taut and tree plumb.
- .7 For deciduous trees over 100 mm in caliper and coniferous trees 350 cm in height and over with Consultant approval:
 - .1 Guy with three double guys and anchors spaced equally around plant.
 - .2 Provide guy looped around plant trunk, encased in hose or rubber belting.
 - .3 Attach guys at 60% of plant height at angle of 45 degrees.
 - .4 Top of anchor to be flush with finished grade.
 - .5 Keep guys taut and plant plumb.
 - .6 Attach flagging tape to guys as safety precaution.
- .8 Consultant reserves the right to adjust the need, method, and quantity of support posts required to adequately stake each tree.

3.5 Pruning

- .1 Perform pruning in accordance with proper practices and standards described in Pruning in Alberta. Consult with Consultant before pruning.
- .2 Prune to provide natural branching structure and to encourage healthy natural growth. Do not prune terminal leader of plant or leave protruding stubs when pruning.
- .3 All improperly pruned plants or plants pruned by Contractor without Consultant's authorization will be subject to rejection. Contractor will replace rejected plants or rectify improper pruning as determined and directed by Consultant.
- .4 Limit pruning to removal of dead or injured branches, stray branches, double leaders, watersprouts and suckers and to compensate for loss of roots as a result of transplanting.
- .5 Do not strip lower branches, raise up crown of trees, top or shear any plant. All such improper pruning will result in rejection and replacement by Contractor.

3.6 Maintenance

- .1 For maintenance during construction installation to Total Performance refer to Specification Section 32 99 00 - Exterior Landscape Maintenance.

3.7 Acceptance

- .1 Plants will be accepted by Consultant at end of maintenance period provided:
 - .1 Plants meet requirements of the specifications.
 - .2 Plants are alive and in healthy, acceptable growing condition.
 - .3 Plants are properly planted, staked and pruned.
 - .4 Plants are recently and thoroughly watered.
 - .5 Plant pits and beds are cultivated and free of weeds, grass and debris.
 - .6 Planting accessories are properly installed and in good condition.
 - .7 All maintenance requirements have been provided.

3.8 Clean-Up

- .1 Broom clean pavement and sidewalks on daily basis or as directed by Consultant. Keep all manhole covers and catch basins free of soil and debris.
- .2 Remove from site excess materials, debris, soils, branches and equipment.
- .3 Repair any damage resulting from Work of this Contract.
- .4 Remove all tags and labels from accepted plants.
- .5 Remove all vehicles, signage, equipment, waste and other hazardous materials, as applicable, from the site.
- .6 Leave site in neat and clean condition.

1. GENERAL

1.1 Hours of Work

- .1 Perform maintenance work during regular working hours as outlined in the Town of Drumheller Community Standards Bylaw 06.19.
- .2 Obtain the Town's approval prior to performing maintenance outside of regular working hours.

1.2 Maintenance Period

- .1 Maintain exterior landscape work for a minimum of 12 (twelve) months, over a two-year period after Date of Substantial Performance of the Work in Contract. The Contractor shall start the maintenance work one month after the Certificate of Substantial Performance is used by the DRFMO or the Consultant.
- .2 Maintenance services shall generally be performed during the landscape growing season (May 1st to September 30th). The Consultant reserves the right to determine actual date of commencement and termination of maintenance based on existing climatic conditions, soil moisture and plant health.
- .3 Any additional maintenance beyond the specified maintenance and warranty period required for Contractor to achieve total performance shall be provided at the Contractor's own expense.
- .4 Any incomplete weeks or months of maintenance shall be carried over to the following landscape growing season.
- .5 The Consultant reserves the right to extend the maintenance period and / or reduce monthly progress payments for maintenance services any time the Contractor neglects to provide adequate maintenance services in accordance with the Contract Specifications, as determined by the Consultant.

1.3 Maintenance Schedule

- .1 The Contractor shall submit a neat, legible and detailed maintenance schedule prior to commencement of maintenance period. List all daily, weekly, and monthly maintenance services and tasks to be perform.

1.4 Quality Control

- .1 Site Supervisor: competent, experienced and knowledgeable to direct and supervise all staff and maintenance work of contract. Supervisor shall possess a Landscape Journeyman Gardener certification or other similar qualification acceptable to the Consultant. Submit supervisor's credentials for the Consultant's approval prior to commencement of work.
- .2 Weekly Site Visits: provide adequate site visits each week with sufficient staff to ensure that all required maintenance services are performed and completed on schedule in accordance with specifications.
- .3 Site Security: Contractor's personnel shall carry personal identification at all times while on site. Identification shall be presented when requested.

- .4 Employee Attire/Safety Vests: all workers shall be properly attired at all times. Each employee working on site shall wear a reflective brightly coloured safety vest for safety and visibility.
- .5 Submittals: submit all required information and documents for the Consultant's approval where specified in the Contract Documents and applicable to work of the Contract and as requested by the Consultant.

1.5 Safety Precautions

- .1 The Contractor shall supply and ensure that all workers use appropriate personal protective equipment as required by Alberta's Occupational Health and Safety Act, Regulations and Code.
- .2 The Contractor shall provide training and ensure all workers practice appropriate safety measures and safe use of tools and equipment in accordance with WHMIS GHS (Workplace Hazardous Materials Information System).
- .3 The Consultant reserves the right to have the Contractor remove any employee from site if not wearing personal protective equipment or if not practicing safe work procedures.
- .4 Regulatory Requirements: perform work in accordance with all applicable laws, codes and regulations required by authorities having jurisdiction over such work and provide all permits required by local authorities.

1.6 Site Inspection / Meetings

- .1 The Contractor and the Consultant shall have a start up meeting prior to starting maintenance for each year following Construction Completion. This meeting will be held on site to review the status of the project and outline any special considerations for the upcoming maintenance period.
- .2 During the initial maintenance establishment period, site meetings and inspections shall be conducted every two weeks or less between the Contractor and the Consultant. The Contractor's workmanship and performance will be reviewed, and other landscape concerns or issues addressed and evaluated.
- .3 Subsequent site meetings and inspections shall be held every 30 days or less after landscape has adequately established, as determined by the Consultant.
- .4 The Consultant shall, at their discretion, conduct random site inspections throughout the maintenance period to evaluate work performed. The Contractor shall promptly correct all deficient work within three days of the Consultant's notification.

1.7 Maintenance Log Requirements

- .1 Maintain and complete a maintenance log for each day of maintenance activity throughout the maintenance period.
- .2 Submit maintenance log data to the Consultant each week for verification and approval of services performed. The Contractor shall ensure maintenance log data is true and accurate. Site supervisor must complete and sign maintenance log.
- .3 Record all maintenance activities including date/time of activities, quantity of water supplied and applied on site, materials used and quantity during maintenance of landscape installations, location where activities were carried out, number of employees and name of supervisor on site.

- .4 Maintenance Invoices: invoices submitted without verifiable maintenance log data to support the invoice will not be accepted. The Consultant will defer payment of the Contractor's invoice until all maintenance services are deemed acceptable and in compliance with specifications as determined by the Consultant.

1.8 Soil Analysis

- .1 The Contractor shall perform all horticultural soil tests during the maintenance period at seed, turf, and planting locations identified by the Consultant. The Contractor shall arrange and pay for the services of an accredited testing laboratory subject to the approval of the Consultant.
- .2 The Contractor shall submit an original copy of each soil test to and review the results with the Consultant.
- .3 Soil analysis for horticultural use shall include results for: existing major soil nutrients; soil pH value; total soluble salts (electrical conductivity); percentage of organic matter; soil texture and percentage of sand, silt and clay; nutrient recommendations; and recommendations for soil amendments, including fertilizer type and application rate.
- .4 The Contractor shall amend soil conditions as recommended by soil analysis report and indicate all corrective measures taken, documenting final soil condition results in the maintenance log.

1.9 Delivery, Storage and Handling

- .1 Remove all equipment and materials off site each day unless on site storage is approved by the Consultant.
- .2 Store tools, equipment and materials in a secure area when not in use during period of operation and at the completion of each scheduled task.
- .3 Contractor shall be present on site to accept delivery of all equipment and/or material shipments. Acceptance of delivery by the Consultant shall not constitute acceptance or responsibility for any of the materials or equipment.

1.10 Damage to Property

- .1 The Contractor shall be held directly responsible for all damages to private and public property, the personal property of all employees, staff and visitors and the property of adjacent land. This includes damage resulting from the actions of the Contractor, the Contractor's employees, subcontractors or representatives who provide service under this Contract.
- .2 The Contractor shall immediately report all damages to the Consultant.
- .3 The Contractor shall repair, replace or restore all damaged property to its original condition or better as directed by the Consultant, including damages to newly graded, topsoiled and seeded or sodded areas. Damages shall be promptly corrected within seven days of approval unless directed otherwise by the Consultant.
- .4 Scalping of turf, mechanical damage or injury to plant material, improper plant pruning, and damages resulting from improper use of chemical pesticides and fertilizers will be considered property damage.
- .5 All costs associated with the repair and replacement of damaged property shall solely be the responsible of the Contractor.

1.11 Protection

- .1 Protect landscape plantings and turf areas at all times against damage of all kinds for the duration of the maintenance period. Maintenance includes temporary protections, fencing, barriers, and signs as required for protection. If any plant material or turf becomes damaged or injured because of insufficient protection, the Contractor shall treat or replace plant material or turf at the Contractor's sole expense.

1.12 Total Performance and Termination of Maintenance

- .1 Work under this section may be accepted by the Consultant at the end of the maintenance period provided all requirements for acceptance contained within the Contract documents have been satisfactorily completed.

1.13 Maintenance Instructions

- .1 The Contractor shall provide two (2) copies of detailed written maintenance instructions identifying the maintenance and care instructions for all seed, turf areas and plant material installed in the Contract.

1.14 Measurement and Payment

- .1 Landscape maintenance shall be paid at the unit price bid per month for "Maintenance – Warranty Period". Unit price shall include for all materials, equipment, labour and incidentals necessary to complete maintenance item of work.
- .2 All associated costs for amending soil conditions will be considered incidental to the Work, and no separate or additional payment will be made.
- .3 The Consultant will have the option of extending the maintenance period, under the sole discretion of the Consultant The payment per month for additional monthly maintenance will be paid at the price bid per month for Maintenance – Warranty Period.
- .4 The Consultant will deem unacceptable any work that is determined to be improper, inadequate, incomplete and not in accordance with the Contract Specifications.

2. PRODUCTS

2.1 Fertilizer:

- .1 Synthetic Turf Fertilizer: apply a complete premium grade synthetic fertilizer, granular in composition, with over 50% of total nitrogen derived from a slow or controlled release nitrogen source to maintain turf in a healthy, vigorous, and green condition. Fertilizer shall contain all essential macronutrients plus 1%-2% iron and other micronutrients.
 - .1 "Weed and Feed" fertilizers are not allowed.
- .2 Fertilizer: apply controlled or slow-release fertilizers in accordance with soil analysis where applicable.

2.2 Planting Medium and Peat Moss:

.1 Planting medium: fertile natural loam, capable of sustaining healthy growth, loose and friable, free of subsoil, clay lumps, stones in excess of 20 mm, live plants, roots or any other deleterious material greater than 20 mm diameter. Planting medium shall be free of litter, foreign matter and toxic materials harmful to plant growth. Planting medium containing construction debris, sod clumps, quack grass or other noxious weeds is not acceptable. Planting medium supplied to site shall meet the following requirements:

- .1 Minimum 6% organic matter.
- .2 Acidity/alkalinity shall range from 5.9 pH to 7.0 pH.
- .3 Electrical Conductivity (E.C.) - level of soluble salts shall not exceed 1.5 dS/m.
- .4 Texture: "Loam" in accordance with Canadian System of Soil Classification. Planting medium shall fall within an allowance of $\pm 2\%$ of the values stated in the table below:

Soil	Sand (%)	Silt (%)	Clay (%)	Class
Loam	35	35	30	Loam

.2 Peat Moss: decomposed plants, fairly elastic and homogeneous, free of decomposed colloidal residue, wood, sulphur and iron. Minimum of 80% organic matter by mass, pH value between 4.5 and 6.0. Furnished in an air-dry state, packed in standard bags or bales showing name of manufacturer.

2.3 Water:

- .1 The Contractor shall submit a detailed watering plan to the Consultant 30 days prior to the start of the maintenance period for review and comments.
- .2 The Contractor shall be fully responsible for all aspects of the providing watering requirements during the maintenance period.
- .3 No motorized vehicles will be allowed on private property during the maintenance periods.
- .4 Supply clean fresh water, water tanker, equipment, sprinklers, and labour necessary to adequately and efficiently apply water to all turf areas and plant materials.
- .5 Record quantity of water supplied and applied on site in maintenance log.

2.4 Plant Protection Materials - Rodent, Animal and Sun Protection:

- .1 Woven wire mesh: galvanized woven wire strands, 1.2 mm wire diameter or suitable alternative with an opening of 12.5 mm x 12.5 mm, c/w fasteners.
- .2 Plastic: perforated spiraled strip for horticultural use.
- .3 Burlap: clean, minimum 2.5 kg/m mass and 150 mm wide, and twine fastener.

3. EXECUTION

3.1 General Workmanship:

- .1 The Consultant will be the sole assessor of the Contractor's maintenance performance and workmanship.
- .2 Schedule timing of operations to growth, weather conditions and use of site. Do each operation continuously and complete within reasonable time period.
- .3 Do not perform work in any location or manner that may endanger the health and safety of the public.
- .4 Collect and dispose of excess material and debris to approved municipal disposal site following collection.
- .5 Coordinate maintenance practices with Town of Drumheller. Alter maintenance schedules, when necessary, to accommodate Town of Drumheller's site activities.
- .6 Contact the Consultant when specified maintenance requirements cannot be met for any reason.
- .7 Submit name and contact number of company representative for immediate or emergency service when necessary.
- .8 Keep a copy of contract specifications and applicable reference documents on site at all times for employee use and reference.
- .9 Contractor's site supervisor must attend all site meetings called by the Consultant to review workmanship and performance.
- .10 The Contractor shall promptly correct all maintenance deficiencies noted by the Consultant during site inspection meetings or following notification of the Consultant's own work inspection results.

3.2 Spring Clean-Up:

- .1 Complete spring clean-up by May 15th or sooner, weather permitting.
- .2 Remove and dispose of protective coverings and mulch used in winter protection.
- .3 Clean, sweep, collect and remove sand, rock chips, salt and other debris accumulated during winter months from all maintained turf and hard surface areas. Re-sweep turf and hard surface areas until completely clean and acceptable to the Consultant. Dispose of all collected debris to approved municipal disposal site.
- .4 Winter protection materials supplied by Contractor shall be removed from site.
- .5 Clean all plant beds and tree wells of plant debris, litter, and other foreign matter. Remove collected debris from site.
- .6 Loosen and lightly cultivate non-mulched planting soil without disturbing roots of permanent plantings. Top up soil and mulch as necessary to meet original grades.
- .7 Sweep and clean hard surface areas and along curbs to remove all litter and debris to maintain clean and tidy site appearances.
- .8 Roll turf areas lightly where grass has lifted due to frost action. Repair damaged or deficient turf areas.

3.3 Seeding Turf Maintenance

- .1 Watering – Seeded and Sodded Areas:

- .1 Provide proper and adequate watering services to all seeded and sodded areas to ensure healthy vigorous growing conditions.
 - .2 Seeded Areas: provide adequate watering of seeded areas to ensure proper seed germination and turf establishment. Supply and operate a portable and mobile irrigation system to water seeded turf areas as necessary until adequately and well established.
 - .3 Sodded Areas: regularly and adequately apply water to all sodded areas. Water shall be deeply and thoroughly applied to keep new sod and underlying soil from drying out and to ensure healthy vigorous growing conditions are maintained. Apply water during early morning or evening to achieve efficient use of water.
 - .4 Water Supply: where water is not available, Contractor shall supply clean water, water truck, pumps, portable sprinkler systems and labour and apply water as necessary to maintain healthy turf conditions.
 - .5 Provide 25 to 40 mm of water weekly including natural rainfall to wet upper 100 to 150 mm of soil in maintained seed and turf areas.
 - .6 During periods of drought stress, apply additional water to maintain healthy turf conditions if necessary.
- .2 Topdressing and Reseeding:
- .1 Top-dress and reseed areas which show root growth failure, deterioration, bare, burnt and thin spots, ruts, wash outs and erosion or which have been damaged by any means or cause, including replacement operations.
 - .2 Mow grass to height of 40 mm. After mowing, rake thoroughly, removing loose and dead grass, stones and debris.
 - .3 Spread planting medium to maximum thickness of 15 mm, filling in low areas and bare spots. For severely damaged turf areas place sufficient planting medium and rake level with finish grade.
 - .4 Overseed areas with seed mixture equivalent to existing grasses and approved by the Consultant. Seed at rate of 50 or 58kg/ha.
 - .5 Rake seed into soil. Roll lightly.
 - .6 Water to ensure penetration of 80 mm and at frequent intervals to maintain vigorous growth.
- .3 Sod Replacement:
- .1 Cut out and remove all areas of dead, or unhealthy sod or which has been damaged by any means or cause and replace with new healthy sod. All repair areas to be square or rectangular.
 - .2 Rake existing soil before installing new sod. Add planting medium to fill uneven and low areas.
 - .3 Butt new sod tightly to adjacent existing sod. Add planting medium to open and exposed joints.
 - .4 Water to ensure penetration of 80 mm and at frequent intervals to maintain healthy growth.
- .4 Seed and Sod Establishment and Erosion:
- .1 Until seeded and sodded areas are established, the Contractor shall be responsible for replacing soils that have eroded into hard surface areas. Residual soils on hard surfaces shall be removed and if not mingled with objectionable materials may be re-used in eroded areas. In the event this

is a continuous problem, the Contractor shall install “jute mat” or other methods to prevent the erosion problem until the seed and turf areas are established.

3.4 Fertilizing

- .1 The Contractor shall be responsible for determining the application type and rate for fertilizer to ensure end product specification is achieved. Prior to any fertilizing being completed, the Contractor shall submit a detailed plan for the Consultant’s review and comments.
- .2 Apply fertilizer as directed by the Consultant or as indicated in soil analysis. Use only mechanical equipment to spread fertilizer. Check spreader calibration to ensure specified application rate is used.
- .3 Spread 50% of fertilizer in one direction, then 50% at right angles.
- .4 Synthetic Fertilizer: apply the following slow-release granular fertilizer unless approved otherwise by the Consultant. Indicate total quantity of fertilizer applied on site in Maintenance Log for each turf area.
- .5 The following type of fertilizer is for guidance only. The Contractor shall be required to complete Spring, Summer and Fall application as noted at a minimum.
 - .1 Spring Application: all turf areas. Apply 26-14-6 or similar slow-release granular fertilizer at rate of 3 kg/100 m² by May 20th.
 - .2 Summer Application: all turf areas. Apply 24-5-11 or similar slow-release granular fertilizer at rate of 3 kg/100 m² by July 15th.
 - .3 Fall Application: all turf areas. Apply 12-3-18 or similar slow-release granular fertilizer at rate of 2 =kg/100 m² by September 30th.
- .6 Water: apply water immediately after spreading fertilizer. Alternatively, Contractor shall time fertilizer applications prior to natural rainfall that will activate the fertilizer and produce the desired response. Ensure moisture penetration of 50 mm minimum.
- .7 Advise the County prior to any application of turf fertilizer. Upon completion of service, provide documentation along with invoice to support type and quantity of turf fertilizer applied.
- .8 Public notice, to be coordinated through the Consultant, shall be given and posted for each property prior to application.

3.5 Mowing - Maintained Areas

- .1 Mowing Height: cut and maintain turf areas at required variable minimum heights respective of the growing season. During periods of active growth turf shall be mowed at minimum required mowing height. During hot dry conditions and slow growth periods turf shall be mowed at increased or maximum heights to maintain turf health. Turf shall generally be cut and maintained as follows:
 - .1 Sodded Areas: cut and maintain turf at 60 - 80 mm height.
 - .2 Seeded Native Grass: provide weed control during seed establishment by mowing weed growth to 100 mm height and remove from site. Mow native seed areas during the last two weeks of June and August or as directed by the Consultant. Mow tall growing native grass at a height of 135 to 150 mm and short growing native grass at a height of 90 to 100

mm. Do not mow native grass lower than specified. Provide an additional cut due to active and/or accelerated growth when directed by the Consultant.

- .2 Mowing Schedule: mow sodded areas on weekly intervals during periods of active growth and more frequently during accelerated growth periods to maintain sod at required height. During periods of hot dry seasonal climatic conditions and when sod growth is slow, sod shall be cut less frequently at an increased height to maintain sod health.
- .3 Mowing shall generally be performed when “one-third” of grass blade can be removed during a single cutting to achieve required turf height. Schedule and complete mowing in one continuous operation, weather permitting. Do not mow sod when insufficient growth is evident or cut sod lower than specified height.
- .4 Mow areas only when dry. Use mowers with sharp blades that will cut cleanly. Areas mowed when wet or with dull blades that tear and leaves ragged leaf edges are unacceptable.
- .5 During periods of extended moisture and excessive sod growth, increase mower blade height and pre-cut sod at an increased height. Remove clippings. After sod dries, lower blade height to specified height and mow sod a second time to achieve required height.
- .6 Remove clippings after each mowing. Small and unnoticeable grass clippings may be left on lawns that are regularly mowed at the desired height.
- .7 Remove papers, rocks, animal waste, and other foreign material before cutting.
- .8 Change direction of cut with each mowing to avoid soil compaction and sod wear or ruts from mower wheels. In the event that sod damage or ruts result, the Contractor shall immediately repair all damaged areas.
- .9 During each cutting operation, temporarily relocate movable site furnishings. Replace to approximate original location after mowing lawn.
- .10 Trimming: trim grass areas as follows:
 - .1 trim grass along fences, walls, signposts, structures, monuments and other select lawn areas not accessible to mowers using a mechanical trimmer. Trim turf at a height no lower than 60 mm. Never scalp turf or damage any plant when using trimmers. Remove resulting plant debris from site.
 - .2 use hand trimmers to trim grass adjacent to trees and other plants to prevent damage to tree trunks, plant stems and roots. Do not use string line trimmers near live plants.
 - .3 cut and neatly trim grass around irrigation equipment, manholes, valves and other surface features in lawn areas. Remove resulting plant debris from site.
- .11 Clean all sidewalks, stairs, roads, parking lots, curbs, hard surfaces, building walls and other required locations of all grass clippings after each mowing to maintain clean site appearances.

3.6 Integrated Pest Management

- .1 Manage and control pests using Integrated Pest Management (IPM) principles that utilizes regular monitoring to identify pests, considers various control options (biological, physical, cultural, mechanical and chemical) before implementing an effective, economical and environmentally acceptable solution to prevent and suppress pests.

- .2 Use IPM principles to reduce or eliminate a reliance on chemical pesticides.
- .3 The Contractor shall be knowledgeable regarding the identification of pests on site, controls to be implemented in management of pests and assessing outcome of treatment actions. Inform the Consultant of all pest concerns on site and controls to be implemented in management of pests. Record all information in the maintenance log.

3.7 Pests: Weed, Insect and Disease Control

.1 Pest Monitoring:

- .1 Pest Monitoring: regularly monitor and visually inspect all plants, turf and other landscape areas to identify potential pest problems and determine appropriate pest controls. Pest problems include insect, disease and weed infestations that pose a serious and on-going threat to plant life on site.
- .2 Ensure proper, positive identification of infestations. Reference “Backyard Pest Management” for identification and control of pests.
- .3 Indicate results of each monitoring inspection in maintenance log. Review all pest concerns with the Consultant. Record all actions taken to control pest problems in log.

.2 General Considerations:

- .1 Use of chemical pesticides are restricted as Town of Drumheller supports the use of IPM practices. Advise Consultant on whether IPM practices are practical in managing and controlling any existing pests on site.
- .2 Determine susceptibility of plant species to pesticide damage before requesting chemical pesticides. Request the Consultant’s approval before use, where chemical pesticides are deemed necessary in the management and control of pest infestations.
- .3 Applications of pesticides shall be performed in accordance with Alberta Environment’s current legislation. Provide the Consultant with three days advance notification of intent to apply chemical pesticides on site.
- .4 Use equipment and containers free of harmful residues not related to specific control measures applicable to situation.
- .5 Certified Applicator: when pesticides are deemed necessary to control pests, the application of each pesticide on site shall be performed by a certified pesticide applicator. Personnel assisting the certified applicator on site shall be thoroughly trained and knowledgeable in pesticide applications and use of all equipment in accordance with Alberta Environment’s Code of Practice for Pesticides. Applicator shall maintain pesticide application record books and submit at completion of each pesticide application.
- .6 Prepare and apply pesticide according to manufacturer’s specifications. Minimize drift at all times. Erect signs to notify building occupants and the public regarding pesticide use on site.
- .7 Timing: pesticides shall be applied at times, which limit any possibility of contamination from climatic and other factors. Monitor weather conditions to avoid making application prior to inclement weather to eliminate potential runoff from treated areas. Confine all applications to outside of regular site operation hours to avoid contamination from drift

and its effect on surroundings, occupants of nearby buildings and site users.

- .8 Ineffective and improper application of pesticide shall be immediately terminated and corrected by Contractor. Additional application of pesticides shall be completed approximately two weeks after initial application is noted as visibly inadequate or deemed deficient by the Consultant.

3.8 Pest Control

.1 Weeds:

- .1 Provide ongoing weed control and eradication methods during active growth and establishment, by cultivation, physical removal and use of approved chemical pesticides.
- .2 Completely eliminate and remove from site all noxious weeds in accordance with government regulations.
- .3 Control and elimination of weeds within soft and hard landscaped surfaces on site on an ongoing basis. Ensure weed seed heads are removed before maturity.

.2 Insects and Disease:

- .1 Apply pesticides based on development stage of insects' life cycles to prevent loss or damage to plant material. Monitor turf areas and plants and apply pesticides, if approved, to control pest infestations.
- .3 Monitor effectiveness of each pesticide application and promptly correct any inadequate or deficient application.
- .4 Repair and pay for damage caused by application of herbicides.
- .5 Do not use soil sterilants.
- .6 Eliminate rodents using controls and methods that comply with Town of Drumheller standards.

3.9 Autumn Preparation

- .1 Leaf Removal: rake and vacuum fallen leaves weekly and remove from site to approved waste recycling depot. Continue until leaves cease to fall.
- .2 Clean all plant beds, planters, tree wells, mulched areas, and other landscaped areas on site weekly. Keep catch basins and all road and parking curbs clean and free of all debris. Remove all collected leaves and other debris to approved waste recycling depot.
- .3 Remove and dispose of annuals from plant beds and planters within one week after first killing frost or when directed by the Consultant. Deep cultivate plant beds and planters.
- .4 Cut back foliage of perennial plants within one week after killing frost. Ornamental grass shall remain intact during winter and trimmed back the following spring unless directed otherwise by the Consultant. Stake locations of cut perennials and apply organic mulch around plants for winter protection as necessary. Thoroughly water all perennial plants for winter.
- .5 Deep root water all plants between September 15th and September 30th in preparation for winter. Supply water, trucking and other necessary accessories to adequately apply water

to each plant. Trees to receive minimum 40 liters of water per 25 mm of trunk diameter (measure at 300 mm above ground level). Apply water throughout tree dripline area. Saturate root area of shrubs/planted areas. Record total quantity of water applied in maintenance log after each day of plant watering activities. Indicate quantity of plants watered each day and their location in maintenance log. Provide additional deep root watering services when warm dry temperatures are experienced in late fall to maintain plant warranty.

- .6 Protect plants from rodent, animal and sun damages by installing appropriate protective materials.
- .7 Sweep and clean all walkways and other hard surface areas weekly. Remove all collected debris and litter from site.
- .8 Supply and erect snow fencing, as necessary, in protection of new landscape installations and as directed by the Consultant.

3.10 Cleanliness of Grounds

- .1 Keep grounds in clean and tidy condition to ensure clean site appearances are continually maintained. Provide minimum twice monthly clean-up services as directed by the Consultant. Sweep, clean, collect and remove all debris, litter, rubbish and pests from project limits.
- .2 Provide prompt service, within 3 hours, when directed by the Consultant to correct or complete clean-up services deemed inadequate or incomplete.
- .3 Pay all costs for collecting and disposing of excess material and debris to municipal disposal site following each site clean-up. Do not dispose of any debris in Town of Drumheller disposal bins on site.
- .4 Sweep and clean all walkways and other hard surface areas weekly, or more frequently, as required. Provide mechanical power wash equipment to clean and wash paved surfaces near buildings if directed by the Consultant.
- .5 Record all cleaning services performed each week in the maintenance log.
- .6 Make weekly inspections for vandalism and damage. Immediately report vandalism and damage to the Consultant. Note all findings in the maintenance log.
- .7 Provide same day response to the Consultant's request to correct, repair, and adjust damage or defacement of plant materials caused by vandalism, accident or weather.