

PART 1 GENERAL

1.1 References

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM C117-95, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C131-96, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .3 ASTM C136-96a, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .4 ASTM D1557-00, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft³) (2,700kN-m/m³).
 - .5 ASTM D1883-99, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
 - .6 ASTM D4318-00, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

1.2 Delivery, Storage, and Handling

- .1 Deliver and stockpile aggregates in accordance with Section 32 11 24 – Granular Sub-Base.

PART 2 PRODUCTS

2.1 Materials

- .1 Granular base: material in accordance with Section 32 11 24 – Granular Sub-Base and following requirements:
 - .1 Liquid limit: to ASTM D4318, maximum 25
 - .2 Plasticity index: to ASTM D4318, maximum 6
 - .3 Los Angeles degradation: to ASTM C131. Max. % loss by weight: 45
 - .4 Crushed particles: at least 60% of particles by mass within each of following sieve designation ranges to have at least 1 freshly fractured face. Material to be divided into ranges using methods of ASTM C136.

| | | |
|---------|----|-------------|
| Passing | | Retained on |
| 50 mm | to | 25 mm |
| 25 mm | to | 19.0 mm |
| 19.0 mm | to | 4.75 mm |

- .5 Soaked CBR: to ASTM D1883, min 80, when compacted to 100% of ASTM D1557.

PART 3 EXECUTION

3.1 Sequence Of Operation

- .1 Place granular base after sub-base surface is inspected, proof rolled and approved by Contract Administrator.
- .2 Placing
 - .1 Construct granular base to depth and grade in areas indicated.
 - .2 Ensure no frozen material is placed.
 - .3 Place material only on clean unfrozen surface, free from snow and ice.
 - .4 Begin spreading base material on crown line or on high side of one-way slope.
 - .5 Place material using methods which do not lead to segregation or degradation of aggregate.
 - .6 Place material to full width in uniform layers not exceeding 150 mm compacted thickness. Contract Administrator may authorize thicker lifts (layers) if specified compaction can be achieved.
 - .7 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
 - .8 Remove and replace that portion of layer in which material becomes segregated during spreading.
- .3 Compaction Equipment
 - .1 Compaction equipment to be capable of obtaining required material densities.
- .4 Compacting
 - .1 Compact to density as specified in Section 31 23 16 – Excavating, Trenching and Backfilling.
 - .2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
 - .3 Apply water as necessary during compacting to obtain specified density.
 - .4 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Contract Administrator.
 - .5 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.2 Site Tolerances

- .1 Finished base surface to be within plus or minus 10 mm of established grade and cross section but not uniformly high or low.

3.3 Protection

- .1 Maintain finished base in condition conforming to this Section until succeeding material is applied or until acceptance by Contract Administrator.

PART 1 GENERAL

1.1 References

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM C117-95, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C131-96, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .3 ASTM C136-96a, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .4 ASTM D422-63(1998), Standard Test Method for Particle-Size Analysis of Soils.
 - .5 ASTM D1557-00, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft³) (2,700kN-m/m³).
 - .6 ASTM D1883-99, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
 - .7 ASTM D4318-00, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

PART 2 PRODUCTS

2.1 Materials

- .1 Granular sub-base material: in accordance with Section 32 11 23 – Granular Base and following requirements:
 - .1 Other Properties as follows:
 - .2 Liquid Limit: to ASTM D4318, Maximum 25.
 - .3 Plasticity Index: to ASTM D4318, Maximum 6.
 - .4 Los Angeles degradation: to ASTM C131. Max% Loss by mass: 40.
 - .5 Soaked CBR: to ASTM D1883, Min 40 when compacted to 100% of ASTM D1557.

PART 3 EXECUTION

3.1 Placing

- .1 Place granular sub-base after subgrade is inspected, proof rolled and approved by Contract Administrator.
- .2 Construct granular sub-base to depth and grade in areas indicated.
- .3 Ensure no frozen material is placed.
- .4 Place material only on clean unfrozen surface, free from snow or ice.

- .5 Begin spreading sub-base material on crown line or high side of one-way slope.
 - .6 Place granular sub-base materials using methods which do not lead to segregation or degradation.
 - .7 Place material to full width in uniform layers not exceeding 150 mm compacted thickness. Contract Administrator may authorize thicker lifts (layers) if specified compaction can be achieved.
 - .8 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
 - .9 Remove and replace portion of layer in which material has become segregated during spreading.
- 3.2 Compaction
- .1 Compaction equipment to be capable of obtaining required material densities.
 - .2 Compact to density as specified in Section 31 23 16 – Excavating, Trenching and Backfilling.
 - .3 Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.
 - .4 Apply water as necessary during compaction to obtain specified density.
 - .5 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Contract Administrator.
 - .6 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.
- 3.3 Site Tolerances
- .1 Finished sub-base surface to be within [10] mm of elevation as indicated but not uniformly high or low.
- 3.4 Protection
- .1 Maintain finished sub-base in condition conforming to this section until succeeding base is constructed, or until granular sub-base is accepted by Contract Administrator.

PART 1 GENERAL

- 1.1 References
 - .1 CAN/CGSB-1.5-M91, Low Flash Petroleum Spirits Thinner.
 - .2 CGSB1-GP-12c-68, Standard Paint Colours.
 - .3 CGSB1-GP-71-83, Method, of Testing Paints and Pigments.
 - .4 CGSB1-GP-74M-79, Paint, Traffic, Alkyd.

PART 2 PRODUCTS

- 2.1 Materials
 - .1 Paint:
 - .1 To CGSB1-GP-74M, alkyd traffic paint.
 - .2 Colour: to CGSB1-GP-12C, yellow 505-308, black 512-301, white 513-301 as indicated.
 - .2 Thinner: to CAN/CGSB-1.5.

PART 3 EXECUTION

- 3.1 Equipment Requirements
 - .1 Paint applicator to be an approved pressure type mobile distributor capable of applying paint in single, double and dashed lines. Applicator to be capable of applying marking components uniformly, at rates specified, and to dimensions as indicated, and to have positive shut-off.
- 3.2 Condition of Surfaces
 - .1 Pavement surface to be dry, free from ponded water, frost, ice, dust, oil, grease and other foreign materials.
- 3.3 Application
 - .1 Lay out pavement markings.
 - .2 Apply paint only when air temperature is above 10°C, wind speed is less than 60km/h and no rain is forecast within next 4h.
 - .3 Apply traffic paint evenly at rate of 3m²/L.
 - .4 Do not thin paint
 - .5 Symbols and letters to conform to dimensions indicated.
 - .6 Paint lines to be of uniform colour and density with sharp edges.
 - .7 Thoroughly clean distributor tank before refilling with paint of different colour.
- 3.4 Tolerance
 - .1 Paint markings to be within plus or minus 12mm of dimensions indicated.
- 3.5 Protection of Completed Work
 - .1 Protect pavement markings until dry.

PART 1 GENERAL

1.1 References

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM D698-91 (1998), Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft³) (600kN-m/m³).
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.2-98, Boiled Linseed Oil.
 - .2 CAN/CGSB-3.3-99, Kerosene.
- .3 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.

PART 2 PRODUCTS

2.1 Materials

- .1 Concrete mixes and materials: to Section 03 30 00 - Cast-in-Place Concrete.
- .2 Reinforcing steel: to Section 03 20 00 - Concrete Reinforcement.
- .3 Joint filler, Curing Compound: to Section 03 30 00 - Cast-in-Place Concrete.
- .4 Granular base: to Section 31 23 16 - Excavating, Trenching and Backfilling.
- .5 Non-staining mineral type form release agent: chemically active release agents containing compounds that react with free lime to provide water soluble soap.
- .6 Fill material: to Section 31 23 16 - Excavating, Trenching and Backfilling.
- .7 Boiled linseed oil: to CAN/CGSB-1.2.
- .8 Kerosene: to CAN/CGSB-3.3.

PART 3 EXECUTION

- .1 Grade Preparation
- .2 Do grade preparation work in accordance with Section 31 23 16 - Excavating, Trenching and Backfilling.

3.2 Granular Base

- .1 Obtain Contract Administrator's approval of subgrade before placing granular base.
- .2 Place granular base material to lines, widths, and depths as indicated.
- .3 Compact granular base to at least 95% SPMDD.

3.3 Concrete

- .1 Obtain Contract Administrator's approval of granular base and reinforcing steel prior to placing concrete.
- .2 Do concrete work in accordance with Section 03 30 00 - Cast-in-Place Concrete.
- .3 Immediately after floating, give sidewalk surface uniform broom finish to produce regular corrugations not exceeding 2 mm deep, by drawing broom in direction normal to centre line.

- .4 Provide edging as indicated with 10 mm radius edging tool.
- .5 Slip-form pavers equipped with string line system for line and grade control may be used if quality of work acceptable to Contract Administrator can be demonstrated.
- 3.4 Tolerances
 - .1 Finish surfaces to within 3 mm in 3 m as measured with 3 m straightedge placed on surface.
- 3.5 Expansion and Contraction Joints
 - .1 Install tooled transverse contraction joints after floating, when concrete is stiff, but still plastic, at intervals of 1.5 m.
 - .2 Install expansion joints as indicated at intervals of 6 m.
 - .3 When sidewalk is adjacent to curb, make joints of curb, gutters and sidewalk coincide.
- 3.6 Isolation Joints
 - .1 Install isolation joints around manholes and catch basins and along length adjacent to concrete curbs, catch basins, buildings, or permanent structure.
 - .2 Install joint filler in isolation joints in accordance with Section 03 30 00 - Cast-in-Place Concrete as indicated.
 - .3 Seal isolation joints with approved sealant.
- 3.7 Curing
 - .1 Cure concrete by adding moisture continuously in accordance with CAN/CSA-A23.1 to exposed finished surfaces for at least 1 day after placing, or sealing moisture in by approved curing compound.
 - .2 Where burlap is used for moist curing, place two pre-wetted layers on concrete surface and keep continuously wet during curing period.
 - .3 Apply curing compound evenly to form continuous film. In accordance with manufacturer's requirements.
- 3.8 Backfill
 - .1 Allow concrete to cure for 7 days prior to backfilling.
 - .2 Backfill to designated elevations with approved material. Compact and shape to required contours as indicated.
- 3.9 Linseed Oil Treatment
 - .1 After concrete has cured for specified curing time and when surface of concrete is clean and dry, apply two coats of linseed oil mixture uniformly to surfaces of curbs, walks and gutters.
 - .2 Linseed oil mixture to consist of 50% boiled linseed oil and 50% mineral spirits by volume.
 - .3 Apply treatment when air temperature above 10 deg C.
 - .4 Apply first coat at 135 mL/m².
 - .5 Apply second coat at 90 mL/m² when first coat has dried.

PART 1 GENERAL

- 1.1 Related Sections
 - .1 Submittal Procedures Section 01 33 00
- 1.2 Measurement Procedures
 - .1 Measure supply and erection of chain link fence in metres erected, including gates.
 - .2 Measure supply and erection of chain link fence gates as units of each size erected.
- 1.3 References
 - .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM A53/A53M-01, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A90/A90M-01, Standard Specification for Mass of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
 - .3 ASTM A653/A653M-01, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron-Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .4 ASTM C618-00, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
 - .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-138.2-96, Steel Framework for Chain Link Fence.
 - .2 CAN/CGSB-138.3-96, Installation of Chain Link Fence.
 - .3 CAN/CGSB-138.4-96, Gates for Chain Link Fence.
 - .4 CAN/CGSB-1.181-99, Ready-Mix Organic Zinc-Rich Coating.
 - .3 Canadian Standards Association (CSA)
 - .1 CSA-A23.1/A23.2-00 (June 2001), Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.
 - .2 CAN/CSA-G164-M92 (R1998), Hot-Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CAN/CSA-A3000-98 (April 2001), Cementitious Materials Compendium. Includes:
 - .1 CAN/CSA-A23.5-98, Supplementary Cementing Materials.
- 1.4 Shop Drawings
 - .1 Submit shop drawings in accordance with Section 01 33 00- Submittal Procedures.
 - .2 Drawings to indicate: details at corners and gates.

PART 2 PRODUCTS

- 2.1 Materials
 - .1 Concrete mixes and materials: in accordance with Section 03 30 00 – Cast-In-Place Concrete.
 - .1 Nominal coarse aggregate size: 20-5.

- .2 Compressive strength: 20 Mpa minimum at 28 days.
 - .3 Additives: fly ash to CAN/CSA-A23.5 ASTM C618.
 - .2 Posts, braces and rails: to CAN/CGSB-138.2, galvanized steel pipe. Dimensions as indicated.
 - .3 Wire Mesh Fabric – Fabric shall be No. 9 gauge steel wire woven into a 50mm diamond pattern. Top and bottom selvage to be knuckled.
 - .4 Tension bar: to ASTM A53/A53M, 5 x 20 mm minimum galvanized steel,
 - .5 Gates: to CAN/CGSB-138.4.
 - .6 Gate frames: to ASTM A53/A53M, galvanized steel pipe, standard weight 45 mm outside diameter pipe for outside frame, 35 mm outside diameter pipe for interior bracing.
 - .1 Fabricate gates as indicated with electrically welded joints, and hot-dip galvanized after welding.
 - .2 Fasten fence fabric to gate with twisted selvage at top.
 - .3 Furnish gates with galvanized malleable iron hinges, latch and latch catch with provision for padlock, which can be attached and operated from either side of installed gate.
 - .7 Fittings and hardware: to CAN/CGSB-138.2, cast aluminum alloy, galvanized steel or malleable or ductile cast iron. Tension bar bands: 3 x 20 mm minimum galvanized steel or 5 x 20 mm minimum aluminum. Post caps to provide waterproof fit, to fasten securely over posts and to carry top rail. Turnbuckles to be drop forged.
 - .8 Organic zinc-rich coating: to CAN/CGSB-1.181.
- 2.2 Finishes
- .1 Galvanizing:
 - .1 For pipe: 550 g/m² minimum to ASTM A90.
 - .2 For other fittings: to CAN/CSA-G164.
- PART 3 EXECUTION**
- 3.1 Grading
- .1 Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts. Provide clearance between bottom of fence and ground surface of 30 mm to 50 mm.
- 3.2 Erection of Fence
- .1 Erect fence along lines as indicated and to CAN/CGSB-138.3.
 - .2 Excavate post holes by methods approved by Contract Administrator.
 - .3 Space line posts 3 m apart maximum, measured parallel to ground surface.
 - .4 Install corner post where change in alignment exceeds 10 degrees.
 - .5 Install end posts at end of fence and at buildings. Install gateposts on both sides of gate openings.
 - .6 Place concrete in post holes then embed posts into concrete to depths as indicated by Contract Administrator. Extend concrete 50 mm above ground level and slope to drain

away from posts. Brace to hold posts in plumb position and true to alignment and elevation until concrete has set.

- .7 Install brace between end and gateposts and nearest line post, at inclination as indicated. Install braces on both sides of corner and straining posts in similar manner.
- .8 Install overhang tops and caps.
- .9 Install top rail between posts and fasten securely to posts and secure waterproof caps and overhang tops.
- .10 Install fabric taut and to tension specified by manufacturer. Where posts have been installed in concrete piles, fabric shall not be installed until piles have cured for five (5) days. Fabric to be installed on the outside of the fence.
- .11 Install bottom tension wire, stretch tightly and fasten securely to end, corner, gate and straining posts with turnbuckles and tension bar bands.

3.3 Installation of Gates

- .1 Install gates in locations as indicated.
- .2 Level ground between gateposts and set gate bottom approximately 40 mm above ground surface.
- .3 Determine position of Centre gate rest for double gate. Cast gate rest in concrete as directed. Dome concrete above ground level to shed water.
- .4 Install gate stops where indicated.

3.4 Touch up

- .1 Clean damaged surfaces with wire brush removing loose and cracked coatings. Apply two coats of organic zinc-rich paint to damaged areas in accordance with Section 09 91 10.

3.5 Cleaning

- .1 Clean and trim areas disturbed by operations. Dispose of surplus material and replace damaged turf with sod as directed by Contract Administrator.

PART 1 GENERAL

1.1 Related Work

- .1 See City of Winnipeg Standard Construction Specifications.

1.2 General

- .1 This specification shall cover the supply and installation of trees, shrubs and other plants, including planting beds as shown on the Drawings.
- .2 The Contractor shall furnish all labour, materials, equipment and services necessary, including all things necessary for and incidental to the satisfactory performance and completion of the Work as specified herein.

1.3 Source Quality Control

- .1 Obtain approval from the Contract Administrator of plant material at source prior to digging.

1.4 Protection

- .1 Coordinate shipping of nursery stock and excavation of holes to ensure minimum time laps between digging and planting.
- .2 Tie branches of nursery stock securely, and protect plants against abrasion, exposure and extreme temperature changes during transit. Avoid binding of plants with rope or wire, which could damage bark, break branches, or destroy the natural shape of the plant.
- .3 Give full support to root ball of nursery stock during lifting.
- .4 Cover plant foliage with tarpaulin, and protect bare roots by means of dampened straw, peat moss, saw dust or other acceptable material to prevent loss of moisture during transit and storage.
- .5 Remove broken and damaged roots with sharp pruning sheers. Make clean cuts, and cover cuts over 10 mm diameter with a tree wound dressing.

PART 2 PRODUCTS

2.1 Planting Beds And Planting Soil

- .1 Planting depth shall be 300 mm unless otherwise stated.
- .2 Soil shall be as specified in City of Winnipeg Standard Construction Specifications.

2.2 Plant Material

- .1 Plant material shall be as specified on the Plant Specification List on the Landscape Plan. All sizes shown are minimum. Plant form, habit, etc., shall be in accordance with the most recent Canadian Nursery Landscape Association (CNL) publications.
- .2 Quality and source are to comply with the Canadian Standards for Nursery Stock, Seventh Edition of CNLA referring to size and development of plant material and root ball. Measure trees when branches are in their natural position. Height and spread dimensions refer to main body of trees and not from branch top to branch top. Use trees of No.1 grade unless specified as multi-stem. Trees are to have only one, sturdy, reasonably straight and vertical trunk, and a well-balanced crown with fully developed leader. Evergreens are to be full and bushy to grade with single leader only. Height o be measured to previous year's growth.

- .3 Trees and shrubs are to be free of disease, insect infestation, rodent damage, sun scald, frost cracks, abrasions, unhealed scars, scars exceeding 5 cm in diameter, major forks or crooks in the trunk, broken branches or angled leaders. Bare root is not acceptable. Plants having the above defects will not be accepted by the Contract Administrator.
 - .4 Nursery stock is to be grown in nurseries under proper cultural practices as recommended by the Canadian Nursery Trades Association. Only nursery stock grown for at least the last four (4) years in nurseries located in an Agriculture Canada Plant Hardiness Zone of 2 (a or b) or 3 (a or b) will be accepted. Nursery stock that has grown in Plant Hardiness Zones of 1 & 4 or greater will be rejected.
- 2.3 Water
- .1 Water is to be potable and free of minerals, which may be detrimental to plant growth.
- 2.4 Fertilizer
- .1 Fertilizer is to be a slow release formulation of low nitrogen and high phosphorus e.g. 10-50-12. apply quantities at rates stated by product manufacturer.
- 2.5 Tree Supports
- .1 Stakes: T-bar, steel, 38 x 38 x 5 x 2440 mm.
 - .2 Wire tightener: Turnbuckle, galvanized steel, 9.5 mm diameter with 270 mm length.
 - .3 Guying Wire: 3 mm diameter multi-wire steel cable.
 - .4 Clamps: U-bolt, galvanized, 13 mm diameter c/w curved retaining bar and hex nuts.
 - .5 Anchors: Wood, 38 x 67 x 600 mm.
 - .6 Guying collar: Tube, plastic, 13 mm diameter, nylon reinforced.
- 2.6 Trunk Protection
- .1 150 mm diameter Corrugated Plastic Pipe 300 mm height.
- 2.7 Landscape Fabric
- .1 'Weedpro' Or Acceptable Equal.
- 2.8 Drainage Materials
- .1 100 mm diameter 'Big O' flexible pipe complete with filter cloth sock.
 - .2 Clean pea stone.
 - .3 100 mm diameter PVC pipe set vertically, complete with screw cap at top.
- 2.9 Mulch
- .1 Wood chip mulch: Local shredded wood chip mulch. 75 mm depth around all trees and in shrub beds as indicated on Landscape Plan.
 - .2 Samples must be supplied for approval prior to installation. No debris permitted.
- PART 3 EXECUTION**
- 3.1 Installation
- .1 Trees and shrubs are to be planted according to the Landscape Plan and planting details.
 - .2 Location of nursery stock will be staked out or painted on Site by the Contractor in consultation with the Contract Administrator.

- .3 The Contractor shall coordinate operations, keeping the Site clean and the planting holes drained. The Contractor shall immediately remove soil or debris spilled onto street pavement, grass or sidewalk.
 - .4 Installation shall be done during periods of suitable weather conditions and in accordance with locally accepted practice. Trees are to be planted within forty-eight (48) hours of excavation from the nursery. No tree pit is to be left open at the end of the Contractor's workday. The planting program is to be planned to ensure that trees delivered to the Site at designated planting locations are installed and thoroughly watered the same day as delivery.
 - .5 Plant trees and shrubs vertically. Orient plants to give best appearance in relation to structures, roads and sidewalks. Place nursery stock to depth equal to depth they were originally growing in the nursery. With balled and burlapped root balls and root balls in wire baskets, loosen burlap and cut away the top 1/3 without disturbing the root ball. Do not pull burlap or rope from under the root ball. Non-biodegradable wrapping must be removed. Tamp planting soil around the root system in layers of 150 mm, eliminating air voids. Frozen or saturated planting soil is unacceptable. When 2/3 of planting soil has been placed, fill hole with water. After water has completely penetrated into soil, complete backfilling.
 - .6 Each tree is to have an earth saucer at its base having a diameter as large as the excavation with a 100 mm lip formed at the perimeter of the saucer to retain water. When planting is completed, give surface of planting saucer dressing of fertilizer and mix fertilizer thoroughly with top layer of planting soil and water in well.
 - .7 Tree Supports
 - .1 All trees shall be staked or guyed with 3 guy wires and anchors, to acceptable horticultural practices and satisfaction of the Contract Administrator.
 - .8 Pruning
 - .1 All new and existing deciduous and coniferous trees shall be pruned. The amount of pruning shall be limited to the minimum necessary to remove dead or injured branches. Pruning shall be done in such a manner as to preserve the natural character of the plants. Leaders shall not be removed. Only clean, sharp tools shall be used. All cuts shall be clean and flush, leaving no stubs. Cuts, bruises or scars on the bark shall be traced back to living tissue and removed. The affected areas shall be shaped so as not to retain water and all cuts of more than 25 mm in diameter shall be painted with approved tree paint.
 - .2 All pruning to be done by an individual with a Manitoba Arborist License.
- 3.2 Damage to Existing Structures and Property and Services and Utilities
- .1 Further to GC:17, all necessary precautions shall be exercised by the Contractor so as not to remove, disturb, or damage any existing trees, shrubs, sod, pavements, streets, roads, boulevards, poles, hydrants, water pipes, gas pipes, electrical wires, cables, conduits, sewers or other existing facilities and equipment at the Site of the Work. For all damage incurred thereto in the performance of the Work, the Contractor shall upon instructions from and to the satisfaction of the Contract Administrator, either replace and repair such damage, whichever may be deemed necessary in the opinion of, and acceptable to, the Contract Administrator. The cost of which shall be borne entirely by the Contractor. The Contractor shall also indemnify and save harmless the City from all claims made directly or indirectly against it in respect to any such damage.
 - .2 The Contractor's operations shall be limited to the minimum area necessary for undertaking the Work and he shall be responsible for all damage resulting from his Work

on private property. The Contractor shall take such measures as are necessary to ensure safe and convenient pedestrian ingress and egress is maintained to private properties while he is working near them. Any damage caused by the negligence of the Contractor or his Sub-contractors to the adjacent Works or properties, shall be promptly repaired by him at his own expense, to the satisfaction of the Contract Administrator.

.3 Existing Services and Utilities

.1 No responsibility will be assumed by the City for correctness or completeness of the Drawings, when provided, with respect to the existing utilities, pipes or other objects either underground or on the surface; the City shall not be liable for the incorrectness and inadequacy thereof. It shall be the responsibility of the Contractor to determine the location of all such utilities, pipes and other objects and to make good any damage done to them.

3.3 Protection of Existing Tree

.1 The Contractor shall take the following precautionary steps to prevent damage from construction activities to existing trees within the limits of the construction area:

.1 Trees greater than 100mm diameter or trees identified to be at risk by the Contract Administrator are to be strapped with 25x100x2440 wood planks, or suitable protected as approved by the Contract Administrator. Do not use nails or other fasteners that penetrate the tree trunk. The width and length of strapping may be reduced to suit the tree being protected as approved by the Contract Administrator.

.2 Excavation shall be performed in a manner that minimizes damage to the existing root systems. Where possible, excavation shall be carried out such that the edge of the excavation shall be a minimum of 1.5 times the diameter (measured in inches), with the outcome read in feet, where 1 inch diameter equals 1 foot measured from the outside edge of the trunk of the tree at 6 inches above grade. Where roots must be cut to facilitate excavation, they shall be pruned neatly at the face of excavation.

.3 Operation of equipment within the drip line of the trees shall be kept to a minimum required to perform the Work required. Equipment shall not be parked, repaired, refuelled; construction materials shall not be stored, and earth materials shall not be stockpiled within the drip lines of trees. The drip line of a tree shall be considered to be the ground surface directly beneath the tips of its outermost branches. The Contractor shall ensure that the operations do not cause flooding or sediment deposition on areas where trees are located.

.4 Repair, replace and maintain tree protection materials during construction until such time no equipment will be working in the area.

.5 Remove safety fencing and strapping material without harming the trees as soon as the construction and restoration Work is complete.

.2 Obtain approval from the Contract Administrator to excavate within 2.0 metres of a tree.

.3 Excavate in a manner to minimize damage to the tree root systems. Keep exposed roots in excavations and trenches moist or shaded. If stockpiling of excavated soil material is required, stockpile in areas away from the tree roots if possible.

.4 Prune exposed roots with equipment such as trencher, chain saws, root cutters or other methods acceptable to the Contract Administrator in a manner that will leave a neat, clean root end.

- .5 Take precautions to ensure tree limbs overhanging the Work area are not damaged by construction equipment. Contact the Contract Administrator for consultation or pruning of overhanging or damaged limbs and branches and other unanticipated problems with trees during the construction of the Works.
 - .6 All damage to existing trees caused by the Contractor's activities shall be repaired to the requirements and satisfaction of the Contract Administrator. Damages must be repaired by an Individual with a Manitoba Arborist License.
- 3.4 Maintenance Period
- .1 Substantial Performance shall be achieved once all materials are in place. The Contractor shall maintain the plant material for one (1) year after the completion of the installation.
 - .2 Water plantings sufficiently and regularly to maintain optimum growth and health of plants without causing erosion. For evergreen plant material, water thoroughly in late fall prior to freeze-up to saturate soil around root system.
 - .3 Remove weeds using control methods acceptable to the Contract Administrator.
 - .4 Maintain tree guards, guy wires, and wrappings in proper repair.
 - .5 Replace or re-spread damaged, missing, or disturbed mulch. Maintain proper mulch depths.
- 3.5 Acceptance
- .1 Total Performance shall be granted at the end of the maintenance period.
- 3.6 Warranty Period
- .1 The Warranty/Maintenance period of one (1) year shall commence at Total Performance. Plant material that is replaced during the maintenance period shall be of the same size, calliper and species as the original plant material unless otherwise agreed to, in writing, by the Contract Administrator. Plant material that is replaced will receive an additional 1 year Warranty/Maintenance period, which will commence on the date of replacement.