

Unicorn Daycare

351 Kootenay Ave, Trail, BC

Landscape Specifications

Issued for Tender

Project #: 22531

Date: 2026/08/26

Unicorn Daycare
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List of Contract Documents:

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The following listed documents and other such documents that may be incorporated in agreement of the parties to the contract prior to the execution of the Agreement shall comprise the Contract Documents. This shall include all addenda issued prior to signing the Agreement.

All work, as it applies to soft landscaping, shall conform to the CLNA and CSLA Standards-Latest Edition. In the event that a discrepancy occurs between these specifications and the said Standards, the Standards shall take precedence.

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PART 1 GENERAL

1.1 WORK INCLUDED

- 1.1.1 Furnish all material, labour and equipment to install all carpentry work as noted on the drawings and as specified herein, unless otherwise noted elsewhere.
- 1.1.2 In general the work shall include, but not necessarily be limited to, the supply and/or installation (where applicable) of fencing, trellises, and benches (including staining).
Requirements

1.2 RELATED WORK

- 1.2.1 See Architectural and Engineering specifications

1.3 REFERENCES

- 1.3.1 All work to be in accordance and compliance with CSA Standards Manual
- 1.3.2 Children's Playspaces and Equipment CAN/CSA-Z614-07, May 2007 edition.

1.4 QUALITY ASSURANCE

- 1.4.1 All carpentry to be in accordance with the "Quality Standards for Architectural Woodwork" latest edition as published by Architectural Woodwork Manufacturers Association of Canada (AWMAC).

Any work which does not meet AWMAC Quality Standards as specified shall be replaced by the Trade Contractor, at no additional cost to the Owner and to the satisfaction of the Landscape Architect.
- 1.4.2 All lumber to be in accordance with NLGA Standard Grading Rules for Canadian Lumber, latest edition including supplements and shall bear the grading stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- 1.4.3 All lumber to be marked at mill and end-marked, delivered to site with certificates as to species, grades, stress grades, seasoning, moisture content, and other evidence as required by the Landscape Architect to show compliance with specifications.
- 1.4.4 All lumber to be properly air dried and seasoned and shall not exceed a maximum moisture content of 19% for exterior use lumber.
- 1.4.5 All preservative treated lumber shall be in accordance with CSA requirements and shall bear the stamp of an approved independent inspection agency.
- 1.4.6 All wood design shall conform to CAN/CSA-086.1-M89, "Engineering Design in Wood (Limit States Design)".

1.5 SUBMITTALS

- 1.5.1 Submit manufacturer's product literature, specifications and colour/finish samples for all pressure treated wood products as specified herein or as required to complete the work for

review and selection.

- 1.5.2 Submit shop drawings and hardware list for all items for review prior to fabrication, clearly indicating all materials, construction details, connections, attachments, anchorage's, and finishes.

1.6 DELIVERY, HANDLING AND STORAGE

- 1.6.1 Protect all lumber against moisture before and after installation to prevent defects.
- 1.6.2 Store carpentry materials in a dry weather tight enclosure, protected against dampness, damage and theft.
- 1.6.3 Handle and treat (cut) pressure treated wood in strict accordance with manufacturer's written instructions.

1.7 WARRANTY

- 1.7.1 Provide the following written warranties from date of Substantial Completion:
- a. Casework manufacturers one (1) year on materials and labour.
 - b. Hardware (hinges and latches) manufacturer's lifetime warranty on defects.

PART 2 PRODUCTS

2.1 MATERIALS

- 2.1.1 Permissible species/minimum grade, unless otherwise noted:
- a. All wood members, unless otherwise noted to be #1 Pressure Treated Hem/Fir.
- 2.1.2 Preservative treatment - by immersion (not by brush) to CAN/CSA 080-Series-M89, with no stripping marks tolerated on any exposed to view surfaces done by a licensed applicator prior to delivery to site.
- 2.1.3 Back priming - in accordance with the requirements of Section 09900 by others or pre-primed at mill site. All exterior boards, frames, trim and siding not pressure treated shall be back primed using same or compatible material to exposed surface finish. Material shall be clean and dry (maximum 15% moisture content) before commencing back priming.
- 2.1.4 Fasteners - in accordance with BCBC requirements and as noted below. Use hot galvanized finish steel for all exterior work and for pressure-preservative and fire-retardant treated lumber except where indicated otherwise. Use standard finish elsewhere with primer paint finish where installed on sight-exposed surfaces.
- 2.1.5 Fixings:
- a. Bolts to ASTM A307 unless otherwise noted, complete with nuts and washers, non-corrosive.
 - b. Screws to ASTM requirements, non-corrosive.

- c. Wire nails, spikes and staples to CSA B111-1974, galvanized.
- 2.1.6 Nails - stainless steel nails best choice (type 316 for salt spray environments). Plain galvanized or electroplated nails are not recommended. Do not use aluminum nails in conjunction with galvanized building components (e.g. flashings).
- 2.1.7 Gate hardware - to requirements indicated on drawings.
- 2.1.8 Connecting hardware - pre-engineered, pre-drilled, purpose made galvanized joist hangers, framing fasteners and anchors to structural Consultant's requirements and pre-approval.
 - a. MGA Connectors, or other pre-approved alternates.

PART 3 EXECUTION

3.1 EXAMINATION

- 3.1.1 Verify all dimensions on site prior to fabrication and installation to ensure a neat and accurate fix. Carpentry contractor shall also verify existing openings and other limitations which might affect size, manufacturing of or installation of manufactured units prior to fabrication.
- 3.1.2 Inspect all areas for unsatisfactory conditions prior to installation.

3.2 WORKMANSHIP AND ASSEMBLY

- 3.2.1 Perform all work using skilled tradesmen to best trade practices.
- 3.2.2 Provide additional items as required for strength, rigidity, cutting, fitting, handling and installation and for subsequent movement and shrinkage, whether indicated or not, such as: backing, bracing, fasteners, dowels, bolts, screws, blocking, grounds, furring, infilling, bearers, bucks, framing, rough hardware, etc.
- 3.2.3 All joints to be accurate, tight and formed to conceal shrinkage.
- 3.2.4 All mill markings - painted or embossed to be sanded or sawed off. All exposed corners to have min 1cm radius.
- 3.2.5 Running finish to be in long lengths, joined only on solid bearing.
- 3.2.6 All surfaces to be sanded smooth and free of splinters
- 3.2.7 Install items plumb, level, square and true to lines with permanent concealed fittings and waterproof glue, neatly scribed to fit adjacent surfaces, ensuring components clear adjacent materials and fixtures.
- 3.2.8 Back prime all exterior wood material to be stained or painted.

3.3 COMPLETION

- 3.3.1 All work to be clean, free from all dirt, damage, marks and faults with all nail holes and other holes filled and material sanded as required ready for finishing.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section .1 Section 31 05 13 - Soil Materials: Topsoil material.
- .2 .2 Section 31 22 19 - Finish Grading: Preparation of subsoil and placement of topsoil in preparation for the work of this Section.
- .3 .3 Section 31 23 23 - Backfilling: Rough grading of site.
- .4 .4 Section 32 84 10 - Landscape Irrigation.
- .5 .5 Section 32 91 19.13 - Topsoil Placement and Grading.
- .6 .6 Section 32 93 43.01 - Tree Pruning.

1.2 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM A1064/A1064M-13, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
- .2 CSA Group
 - .1 CSA G30.18-[09], Carbon Steel Bars for Concrete Reinforcement.
- .3 Health Canada - Pest Management Regulatory Agency (PMRA)
 - .1 National Standard for Pesticide Education, Training and Certification in Canada (1995).
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .5 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
 - .2 Fertilizers Act (R.S. 1985, c. F-10).
 - .3 Fertilizers Regulations (C.R.C., c. 666).
 - .4 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

1.3 DEFINITIONS

- .1 Mycorrhiza: association between fungus and roots of plants. This symbiosis, enhances plant establishment in newly landscaped and imported soils.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Scheduling:
 - .1 Obtain approval from Consultant of schedule indicating beginning of Work.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide in accordance with Section 01 33 00 - Submittal Procedures.

- .2 Product Data:
 - .1 Provide manufacturer's instructions, printed product literature and data sheets for tree and shrub preservation materials and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Provide monthly written reports on maintenance during warranty period, to Consultant identifying:
 - .1 Maintenance work carried out.
 - .2 Development and condition of plant material.
 - .3 Preventative or corrective measures required which are outside Contractor's responsibility.
 - .3 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements & 01 35 43 - Environmental Procedures.
- .3 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Provide project Waste Management Plan & Waste Reduction Workplan highlighting recycling and salvage requirements.
 - .2 Provide calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75 % of construction wastes were recycled or salvaged.
 - .2 Recycled Content:
 - .1 Provide listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of [post-consumer] [post-industrial] content, and total cost of materials for project.
 - .3 Regional Materials: Provide evidence that project incorporates required percentage 20% of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions and 01 61 00 - Common Product Requirements.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials indoors and in dry location off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect tree and shrub preservation materials from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

1.7 MAINTENANCE DURING WARRANTY PERIOD

- .1 From time of acceptance by Consultant to end of warranty period, perform following maintenance operations.
 - .1 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.
 - .2 Apply pesticides in accordance with National Standard for Pesticide Education, Training and Certification in Canada, Federal, Provincial and Municipal regulations as and when required to control insects, fungus and disease. Obtain product approval from Departmental Representative prior to application.
 - .3 Apply fertilizer in early spring at manufacturer's suggested rate.
 - .4 Remove dead, broken or hazardous branches from plant material. [Dispose of debris through composting or mulching if appropriate.

Part 2 Products

2.1 MATERIALS

- .1 Fill:
 - .1 Type (A): clean, natural river sand and gravel material, free from silt, clay, loam, friable or soluble materials and organic matter.
 - .2 Type (B): excavated soil, free from roots, rocks larger than 3 inches, building debris, and toxic ingredients (salt, oil, etc). Excavated material shall be approved by Consultant or Departmental Representative before use as fill.
- .2 Coarse washed stones: 1.5-3 inches diameter clean round hard stone.
- .3 Draintile: 4 inches diameter corrugated recycled content plastic perforated tubing complete with snap couplings. Fill vents with .8 inch clear stone.
- .4 Unamended Peatmoss:
 - .1 Derived from partially decomposed species of Sphagnum Mosses.
 - .2 Elastic and homogeneous.
 - .3 Free of wood and deleterious material which could prohibit growth.
 - .4 Shredded minimum particle size: 0.2 inches.
 - .5 To have a natural pH and is not to be amended with lime.
- .5 Fertilizer:
 - .1 To Canada Fertilizer Act and Fertilizers Regulations.
 - .2 Complete, commercial, slow release with 35% of nitrogen content in water-insoluble form.
- .6 Anti-desiccant: commercial, wax-like emulsion.
- .7 Filter Cloth:
 - .1 Type 1: 100 % non-woven needle punched polyester, .10 inches thick, 5.7 lb/ft² mass.
 - .2 Type 2: biodegradable burlap.

- .8 Wood posts: 1.5 x 3.5 x 95 inches length, untreated wood.
- .9 Welded wire fabric (WWF): 4 x 4 inches, to CSA G30.18 & ASTM A1064/A1064M.
- .10 Board Cladding: to consist of 2 x 4 inch lumber secured around the perimeter of tree trunks with plastic strapping or other means which will not damage the tree.
- .11 Tree Barriers: steel T-rail posts 15.75 x 15.75 x 0.2 x 100 inches, at 70 inches o.c., with wood slat snow fencing attached to posts with 9 gauge wire, 13 per post.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for tree and shrub preservation installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Consultant.
 - .2 Inform Consultant of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant and Arborist.

3.2 IDENTIFICATION AND PROTECTION

- .1 Tree protection to be installed prior to the start of any on site work.
- .2 Identify plants and limits of root systems to be preserved as approved by Consultant and Arborist.
- .3 Protect plant and root systems from damage, compaction and contamination resulting from construction as approved by Consultant and Arborist.
- .4 Ensure no root pruning is done inside drip line. If pruning inside drip line is required consult an arborist or Canadian Certified Horticultural Technician (CCHT) as approved by Consultant and Arborist.

3.3 TRUNK PROTECTION

- .1 Install board cladding vertically around the perimeter of designated deciduous trees within the active work zone.

3.4 ROOT CURTAIN SYSTEM

- .1 Identify limits for required construction excavation as approved by Consultant and Arborist.
- .2 Prior to construction excavation, hand dig trench minimum 20 inches wide x 60 inches deep, along perimeter of excavation limits.
- .3 Prune exposed roots cleanly at side of trench nearest plants to be preserved. Pruned ends to point obliquely downwards.
- .4 Install wooden posts and welded wire fabric against construction edge of trench.
- .5 Securely attach Type 2 filter fabric on plant side of wire mesh.

- .6 Prepare homogeneous mixture of fertilizer, parent material and organic matter.
 - .1 Add organic matter to mixture to achieve 7-9 % organic matter content by weight.
 - .2 Incorporate with mixture grade 2:12:8 ratio fertilizer dry at rate of 0.1lb/ft³.
- .7 Backfill with homogeneous mixture between curtain wall and plants to be preserved in layers not exceeding 5.9 inches in depth. Compact each layer to 85% Standard Proctor Density.
- .8 Protect root curtain from damage during construction operations.
- .9 Water plants and root curtain sufficiently during construction to maintain optimum soil moisture condition until backfill operations are complete.
- .10 Protect root curtain before & during backfill operations. Ensure root curtain is cut down to 11.8 inches below finished grade and remove cut material.

3.5 AIR LAYERING SYSTEM

- .1 Using manual methods, carefully remove turf, plants, leaves and organic matter in area of root system, dispose of plant matter through compost site and slightly loosen topsoil surface. Avoid damage to root system.
- .2 Lay horizontal system of perforated recycled content drain pipe on surface of existing grade.
 - .1 Slope drain tile minimum 3 % for drainage away from trunk of tree.
 - .2 Connect system with general site drainage system or drain to low point on site.
- .3 Install plastic vent pipes vertically over joints in horizontal pipe system or where indicated. Top of vent pipe to be 0.8 inches above finished grade of fill. Keep top of vent pipe covered during construction.
- .4 Cover joints with Type 1 filter fabric and place coarse washed stone around joints and vertical pipes to secure their position.
- .5 Construct drywell around trunk of tree.
 - .1 Ensure open ends of vertical vent pipes & horizontal pipe system are left exposed for air circulation to root system.
 - .2 Protect openings from blockage during construction.
 - .3 Install protective caps on exposed horizontal openings.
- .6 Place 7.85 inches depth of coarse washed stone on surface of original ground and horizontal pipe system to limits.
- .7 Place Type 1 filter fabric over surface of granular layer.
- .8 Place Type A fill over filter fabric to required depth without disturbing or damaging drain pipe system. Avoid damage to filter fabric.
- .9 Complete finished paving or topsoil and sodding over area of sub-surface system within 1 week of placing fill.
- .10 Remove temporary protective covering from vent pipe openings. Install protective caps flush with finished grade.

3.6 TRENCHING AND TUNNELING FOR UNDERGROUND SERVICES

- .1 Centre line location and limits of trench/tunnel excavation to be approved by Consultant and Arborist prior to excavation. Tunnel excavation to extend 79 inches from edge of trunk on either side.
- .2 Excavate manually within zone of root system. Do not sever roots greater than 1.6 inches diameter except at greater than 20 inches below existing grade. Protect roots, and cut roots cleanly with sharp disinfected tools.
- .3 Excavate tunnel under centre of tree trunk using methods and equipment approved by Consultant and Arborist.
- .4 Minimum acceptable depth to top of tunnel: 39.5 inches.
- .5 Backfill for tunnel and trench to 85% Standard Proctor Density. Avoid damage to trunk and roots of tree.
- .6 Complete tunnelling and backfilling at tree within 2 weeks of beginning Work.

3.7 LOWERING GRADE AROUND EXISTING TREE

- .1 Begin Work in accordance with schedule approved by Consultant.
- .2 Cut slope not less than 19.7 inches from tree trunk to new grade level.
- .3 Excavate to depths as indicated. Protect root zone designated to remain from damage.
- .4 When severing roots at excavation level, cut roots with clean, sharp tools.
- .5 Cultivate excavated surface manually to 0.6 inches depth.
- .6 Prepare homogeneous soil mixture consisting by volume of:
 - .1 60% excavated soil cleaned of roots, plant matter, stones, debris.
 - .2 25% coarse, clean sterile sand.
 - .3 15% organic matter.
 - .4 Grade 2:12:8 fertilizer at rate of 0.09lb/ft³.
- .7 Place soil mixture over area of excavation to finished grade level. Compact to 85% Standard Proctor Density.
- .8 Water entire root zone to optimum soil moisture level.

3.8 PRUNING

- .1 Prune in accordance with Section 32 93 43.01 - Tree Pruning.
- .2 Prune crown to compensate for root loss while maintaining general form and character of plant. Dispose of debris through composting or mulching if applicable.

3.9 ANTI-DESICCANT

- .1 Apply anti-desiccant to foliage where applicable and as directed by Consultant.

3.10 VERIFICATION

- .1 Verification requirements in accordance with Section 01 47 17 - Sustainable Requirements: Contractor's Verification, include:

- .1 Materials and resources.
- .2 Storage and collection of recyclables.
- .3 Construction waste management.
- .4 Local/regional materials.
- .5 Low-emitting materials.

3.11 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse & recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Aggregate base course.

1.2 PRICE AND PAYMENT PROCEDURES

- .1 Coarse Aggregate Fill by the cubic metre. Includes stockpiling, scarifying substrate surface, placing where required, and compacting.
- .2 Coarse Aggregate Fill by the square metre down to a drawing defined elevation. Includes stockpiling, scarifying substrate surface, placing where required, and compacting.
- .3 Fine Aggregate Fill by the cubic metre. Includes stockpiling, scarifying substrate surface, placing where required, and compacting.
- .4 Fine Aggregate Fill by the square metre down to a drawing defined elevation. Includes [supplying fill material] stockpiling, scarifying substrate surface, placing where required, and compacting.

1.3 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.

1.4 CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

Part 2 Products

2.1 MATERIALS

- .1 Coarse Aggregate Fill Type [A1]: As specified in Section [31 05 16].
- .2 Blended Aggregate Fill Type [A2]: As specified in Section [31 05 16].
- .3 Fine Aggregate (Sand) Fill Type [A3]: As specified in Section [31 05 16].

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify substrate has been inspected, gradients and elevations are correct, and is dry.

3.2 PREPARATION

- .1 Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.
- .2 Do not place fill on soft, muddy, or frozen surfaces.

3.3 AGGREGATE PLACEMENT

- .1 Place aggregate in maximum 150 mm layers and roller compact to specified density.

- .2 Level and contour surfaces to elevations and gradients indicated.
- .3 Add small quantities of fine aggregate to coarse aggregate as appropriate to assist compaction.
- .4 Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.
- .5 Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.4 TOLERANCES

- .1 Section 01 73 00: Tolerances.
- .2 Flatness: Maximum variation of 6 mm measured with 3 m straight edge.
- .3 Scheduled Compacted Thickness: Within 6 mm.
- .4 Variation From Design Elevation: Within 13 mm.

3.5 FIELD QUALITY CONTROL

- .1 Section 01 45 00: Field [testing] [inspection].
- .2 Compaction testing will be performed to [ASTM D698] [ASTM D1556/D1556M] [ASTM D1557] [AASHTO T 180] [ASTM D2167].
- .3 If tests indicate Work does not meet specified requirements, remove Work, replace and retest.

3.6 SCHEDULES

- .1 Compact placed aggregate materials to achieve compaction of 95%.
- .2 Under Concrete Pavement: Compact placed aggregate materials to achieve compaction of 95%.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Concrete sidewalks, paved areas, stair steps, integral curbs.
- .2 Aggregate base course.

1.2 RELATED SECTIONS

- .1 Section 32 14 13 - Precast Concrete Unit Paving: Unit Pavers.
- .2 Section 32 11 23 - Aggregate Base Course

1.3 PRICE AND PAYMENT PROCEDURES

- .1 Concrete Pavement Mix (Base): By the cubic metre. Includes mix design, supplying to site, testing.
- .2 Concrete Pavement Mix (Wearing Course): By the cubic metre. Includes mix design, supplying to site, testing.
- .3 Concrete Placed: By the square metre per 25 mm thickness. Includes preparing base, placing, floating and finishing, testing.

1.4 REFERENCES

- .1 [ACI 301-10 - Specifications for Structural Concrete for Buildings.]
- .2 [ASTM C94/C94M-15a - Standard Specification for Ready-Mixed Concrete.]
- .3 [ASTM C260/C260M-10a - Standard Specification for Air-Entraining Admixtures for Concrete.]
- .4 [ASTM D1751-04(2013)e1 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).]
- .5 [ASTM D1752-04a(2013) - Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.]
- .6 [CSA-A23.1-09/A23.2-14 - Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.]
- .7 [CSA-A3000-13 - Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).]
- .8 [CSA-G30.18-09 (R2014) - Carbon Steel Bars for Concrete Reinforcement.]
- .9 [CAN/CSA-S269.3-M92 (R2013) - Concrete Formwork.]
- .10 [CSA-W186-M1990 (R2012) - Welding of Reinforcing Bars in Reinforced Concrete Construction.]

1.5 PERFORMANCE REQUIREMENTS

- .1 Paving: Designed for the following.
 - .1 Light duty commercial vehicles.

.2 Pedestrian areas.

1.6 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

1.7 SUBMITTALS FOR INFORMATION

.1 Section 01 33 00: Submission procedures.

1.8 CLOSEOUT SUBMITTALS

.1 Section 01 78 10: Submission procedures.

1.9 QUALITY ASSURANCE

.1 Perform work in accordance with requirements of Sections [03 30 00] [03 20 00] [03 11 00] and City of Richmond standards.

.2 Obtain cementitious materials from same source throughout.

1.10 REGULATORY REQUIREMENTS

.1 Conform to applicable standards for paving work on City property.

1.11 SITE CONDITIONS

.1 Ambient Conditions:

.1 Do not place concrete when base surface temperature is less than 4 degrees C, or surface is wet or frozen.

Part 2 Products

2.1 FORM MATERIALS

.1 Form Materials: As specified in Section [03 11 00].

.2 Form Materials: Wood forms, profiled to suit requirements and site conditions.

.3 Joint Filler: [ASTM D1751]

2.2 REINFORCEMENT

.1 Reinforcing Wire: Wire type specified in Section 03 20 00, galvanized.

.2 Reinforcing Steel: [CSA-G30.18], 276 MPa yield grade; deformed billet steel bars; galvanized.

.3 Welding of Reinforcing Steel: Conform to [CSA-W186].

.4 Fabricated Mats: Comprised of deformed steel bars for concrete reinforcement.

.5 Dowels: Plain steel, 276 MPa yield grade, galvanized finish.

2.3 CONCRETE MATERIALS

.1 Concrete Materials: As specified in Section [03 30 00].

- .2 Concrete Materials: In accordance with City of Richmond standards.
- .3 Air Entrainment: [ASTM C260/C260M].
- .4 Fine and Coarse Mix Aggregates: Refer to [CSA-A3000] and Section 03 30 00.
- .5 Water: Potable, not detrimental to concrete.
- .6 Chemical Admixture: [CSA-A3000].

2.4 CONCRETE MIX - BY PERFORMANCE CRITERIA

- .1 Mix and deliver concrete to [ASTM C94/C94M].
- .2 Select proportions for normal weight concrete in accordance with the following:
 - .1 The concrete supplier to provide mix design and strength by trial batch.
 - .2 The concrete supplier to provide field test criteria to achieve specified performance criteria.
 - .3 The concrete supplier to provide concrete to specific minimum water/cement ratio.
- .3 Use accelerating admixtures in cold weather only when approved by Consultant. Use of admixtures will not relax cold weather placement requirements.
- .4 Use calcium chloride only when approved by Consultant.
- .5 Use set retarding admixtures during hot weather only when approved by Consultant.

2.5 SOURCE QUALITY CONTROL

- .1 Section 01 43 00: Manufacturer quality control.
- .2 Submit proposed mix design to appointed firm for review prior to commencement of work.
- .3 Tests on cement and aggregates will be performed to ensure conformance with specified requirements.
- .4 Test samples to [CSA-A23.1/A23.2].

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 70 00: Verify base conditions before starting work.
- .2 Verify compacted subgrade, granular base, and stabilized soil is acceptable and ready to support paving and imposed loads.
- .3 Verify gradients and elevations of base are correct.

3.2 SUBBASE

- .1 Subbase: Section 32 11 23 - Aggregate Base Course.
- .2 Subbase: Prepare subbase in accordance with City of Richmond standards.

3.3 PREPARATION

- .1 Moisten base to minimize absorption of water from fresh concrete.
- .2 Coat surfaces of manhole, catch basin, and drain frames with oil to prevent bond with concrete pavement.
- .3 Notify Consultant minimum twenty-four (24) hours prior to commencement of concreting operations.

3.4 FORMING

- .1 Place and secure forms to correct location, dimension, profile, and gradient.
- .2 Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- .3 Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.5 REINFORCEMENT

- .1 Place reinforcement as directed.
- .2 Interrupt reinforcement at expansion joints.
- .3 Place reinforcement to achieve pavement and curb alignment.
- .4 Provide dowelled joints at interruptions of concrete, with one end of dowel set in capped sleeve to allow longitudinal movement.

3.6 PLACING CONCRETE

- .1 Coordinate installation of snow melting components.
- .2 Place concrete as specified in Section [03 30 00].
- .3 Place concrete in accordance with City of Richmond standards.
- .4 Place concrete using the slip form technique.
- .5 Ensure reinforcement, inserts, embedded parts, and formed joints are not disturbed during concrete placement.
- .6 Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.
- .7 Place concrete to pattern indicated on Landscape drawings.

3.7 JOINTS

- .1 Place expansion joints at 6 m intervals. Align curb, gutter, and sidewalk joints.
- .2 Place joint filler between paving components and building or other appurtenances. Recess top of filler 6mm for sealant placement by Section 07 92 00.
- .3 Provide keyed joints as indicated.
- .4 Saw cut contraction joints 5 mm wide at an optimum time after finishing. Cut one third (1/3) into depth of slab.

3.8 FINISHING

- .1 Paving: Light broom.
- .2 Sidewalk Paving:
 - .1 Wood float.
 - .2 Exposed aggregate.
 - .3 Light broom, and trowel joint edges
- .3 Curbs and Gutters: Light broom.
- .4 Direction of Texturing: Perpendicular to pavement direction, or as indicated.
- .5 Place sealer on exposed concrete surfaces immediately after finishing. Apply to manufacturer's written instructions.

3.9 JOINT SEALING

- .1 Separate pavement from vertical surfaces with joint filler.
- .2 Place joint filler in pavement pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- .3 Extend joint filler from bottom of pavement to within 13 mm of finished surface. Conform to Section [07 92 00] for finish joint sealer requirements.

3.10 TOLERANCES

- .1 Section 01 73 00: Tolerances.
- .2 Maximum Variation of Surface Flatness: 6 mm
- .3 Maximum Variation From True Position: 6 mm.

3.11 FIELD QUALITY CONTROL

- .1 Section 01 45 00: Field [inspection] [testing].
- .2 Testing firm will take cylinders and perform slump and air entrainment tests in accordance with [ACI 301].
- .3 Three concrete test cylinders will be taken of concrete placed each day of each class or every 57 cu m or less of concrete placed each day.
- .4 One (1) additional test cylinder will be taken during cold weather and cured on site under same conditions as concrete it represents.
- .5 One slump test will be taken for each set of test cylinders taken.
- .6 Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.12 PROTECTION OF FINISHED WORK

- .1 Section 01 78 40: Protecting installed work.
- .2 Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.

- .3 Do not permit pedestrian traffic over pavement for seven (7) days minimum after finishing.
- .4 Do not permit pedestrian traffic over pavement until [75%] design strength of concrete has been achieved.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Formed and reinforced concrete sidewalks, street side curbs and gutters.
- .2 Paraplegic ramps.

1.2 RELATED SECTIONS

- .1 Section 03 30 00 - Cast-in-Place Concrete.

1.3 REFERENCES

- .1 [ASTM D698-12e2 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³ (600 kN-m/m³)).]
- .2 [CSA-A23.1-09/A23.2-14 - Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.]

1.4 PRICE AND PAYMENT PROCEDURES

- .1 Concrete Walks: Measured in square metres.
- .2 Concrete Curbs: Measured in linear metres.
- .3 Concrete Gutters: Measured in linear metres.
- .4 Borrow Material: Measured in cubic metres of fill compacted in place.

1.5 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.

1.6 CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

Part 2 Products

2.1 MATERIALS

- .1 Granular Base: Sections 31 23 16 and 31 23 23 for excavating, fill and compaction.
- .2 Forms: Section 03 11 00.
- .3 Reinforcement: Section 03 20 00.
- .4 Concrete Mix and Materials: Section 03 30 00.
- .5 Curing Compound: Section 03 30 00.
- .6 Joint filler: Section 03 30 00.
- .7 Form Release Agent: Non-staining mineral type, chemically active containing compounds that react to provide a water soluble soap for ease of release.

Part 3 Execution

3.1 PREPARATION

- .1 Construct embankments using excavated material free from organic matter or other objectionable materials.
- .2 Store surplus or unsuitable excavated material at a location as directed by Consultant.
- .3 Place fill in maximum 150 mm layers, compact to [95%] of optimum density to [ASTM D698].
- .4 Obtain Consultant approval of subgrade before placing granular base.
- .5 Place granular base material to lines, widths, and depths as indicated.
- .6 Compact base to [95%] of optimum density.

3.2 CONCRETE PLACEMENT

- .1 Perform concrete work to Section 03 30 00.
- .2 Immediately after rough floating, provide uniform broom finish to produce regular surface texture not exceeding 1.5 mm deep, by drawing broom in direction normal to centre line.
- .3 Provide edging as indicated with 10 mm radius edging tool.
- .4 Form concrete with string line for line and grade control.
- .5 Hand finish surfaces when directed by Landscape Consultant.

3.3 TOLERANCES

- .1 Section 01 73 00: Tolerances.
- .2 Finish surfaces flat to within 3 mm as measured with straightedge placed on surface.

3.4 JOINTS

- .1 Install tooled transverse contraction joints after floating, when concrete is stiff but still plastic.
- .2 Place lateral expansion joints at intervals of 6 m.
- .3 Place isolation joints around manhole rings, catch basins, and adjacent to concrete curbs, catch basins, buildings, or permanent abutting surfaces.
 - .1 Install joint filler in isolation joints [to Section 03 30 00] [as indicated].
 - .2 Seal isolation joints with sealant approved by Consultant.
- .4 When sidewalk is adjacent to curb or gutter, form joints of curb, gutter, and sidewalk to coincide.

3.5 CURING

- .1 Cure concrete by adding moisture continuously to [CSA-A23.1/A23.2], to exposed finished surfaces for minimum one (1) day after placing, or by sealing moisture by a surface curing compound approved by Consultant.

- .2 Apply curing compound evenly to form continuous film to compound manufacturer's requirements.

3.6 PARAPLEGIC RAMPS

- .1 Remove existing curbs, gutters or sidewalks as indicated to construct paraplegic ramp.
- .2 Removals to begin and end at existing joints only. No saw cuts in existing work is permitted.
- .3 Construct concrete paraplegic ramps to lines and grades and slope gradients as indicated.
- .4 Hand finish ramp surfaces when and where directed by Landscape Consultant.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 43 00 - Quality Assurance: Inspection of bearing surfaces.
- .2 Section 03 30 00 - Cast-in-Place Concrete.
- .3 Section 32 11 23 - Aggregate Base Course.

1.2 MEASUREMENT PROCEDURES

- .1 Unit paving will be measured for payment in square metres.

1.3 REFERENCE STANDARDS

- .1 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM C117-95, Standard Test Method for Material Finer Than 0.075mm (No.200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C136-01, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM C902-02, Standard Specification for Pedestrian and Light Traffic Paving Brick.
 - .4 ASTM C1272-02, Standard Specification for Heavy Vehicular Paving Brick.
 - .5 ASTM D698-00a, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³(600kN-m/m³)).
 - .6 ASTM D1557-00, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³(2,700kN-m/m³)).
 - .7 ASTM E11-01, Standard Specification for Wire-Cloth Sieves for Testing Purposes.
- .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.
- .3 Canadian Standards Association (CSA International).
 - .1 CSA A23.1/A23.2, Concrete Materials and Methods of Construction/Methods of Test for Concrete.
 - .2 CSA A179-94 (R1999), Mortar and Grout for Unit Masonry.
 - .3 CSA-A231.1-99, Precast Concrete Paving Slabs.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit following product test data:
 - .1 Sieve analysis for gradation of bedding and joint material.
 - .2 Unit paver test data.
- .2 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

- .3 Indicate layout, pattern and relationship of paving joints to fixtures and project formed details.
- .4 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .5 Submit full size sample of each type paving unit.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, polystyrene, corrugated cardboard, plastic, and packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Divert unused concrete materials from landfill to local facility as approved by Departmental Representative.
- .5 Divert unused aggregate materials from landfill to facility or quarry for reuse as approved by Departmental Representative.
- .6 Divert unused geotextiles from landfill to plastic recycling facility approved by Departmental Representative.
- .7 Fold up metal banding, flatten and place in designated area for recycling.

Part 2 Products

2.1 MATERIALS

- .1 Unit pavers: uniform in material, colour, size and from one manufacturer.
- .2 Precast concrete unit paving: refer to the material schedule on landscape drawings for material type, size, colour, thickness, pattern, and finish.
- .3 Crushed stone or gravel base course: consisting of hard, durable, angular particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials.
 - .1 Gradations: within limits specified when tested to ASTM C117 and ASTM C136. Sieve sizes to CAN/CGSB-8.2 and CAN/CGSB-8.1 rather than ASTM E11.

Sieve Designation	% Passing
19 mm	100
12.5 mm	70-100
4.75 mm	40 - 70
2.00 mm	23 - 50
0.425 mm	7 - 25
0.075 mm	3 - 8

- .4 Manufactured sand for bedding: hard, durable, crushed stone particles, conforming to gradation of concrete sand as specified in CAN/CSA A23.1. Sand: free from clay lumps,

cementation, organic material, frozen material and other deleterious materials. Do not use limestone screenings or stone dust.

- .1 Gradations: within limits specified when tested to ASTM C117 and ASTM C136. Sieve sizes to CAN/CGSB-8.2 and CAN/CGSB-8.1 rather than ASTM E11. 0% to pass 0.075 mm sieve.

Sieve Designation	% Passing
10 mm	100
5 mm	95-100
2.5 mm	80-100
1.25 mm	50 - 90
0.630 mm	25 - 60
0.315 mm	10 - 35
0.160 mm	2 - 10

- .5 Joint sand: to CSA A179, hard, durable, angular particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials.
- .6 Edging: As per landscape detail.
- .7 Geotextile filter: Non-woven fabric material. As per landscape detail.

Part 3 Execution

3.1 PROTECTION

- .1 Prevent damage to fences, curbs, landscaping, sidewalks, roads, trees, buildings, and adjacent property. Make good any damage.
- .2 Provide access to building at all times. Coordinate paving schedule to minimize interference with normal use of premises.

3.2 SUBGRADE

- .1 Ensure that subgrade preparation conforms to levels and compaction required to allow for installation of granular base.

3.3 GEOTEXTILE

- .1 Install geotextile filter as indicated.

3.4 GRANULAR BASE

- .1 Base minimum thickness: as indicated.
- .2 Spread and compact crushed stone or gravel base in uniform layers not exceeding 150 mm compacted thickness.
- .3 Compact base to a density of not less than 95 % Modified Density in accordance with ASTM D698 and D1557 as per City of Victoria guidelines.
- .4 Shape and roll alternately to obtain smooth, even and uniformly compacted granular base and ensure conformity of grades with finish surface.
- .5 Apply water as necessary during compaction to obtain specified density. If granular base is excessively moist, remove it and install more granular material to rid it of sponginess.

- .6 In areas not accessible to rolling equipment, compact to specified density with approved mechanical tampers.
- .7 Ensure top of granular base does not exceed plus or minus 10 mm over 3 m straightedge.

3.5 EDGING

- .1 Install edging true to grade, in location, layout, and pattern as indicated.

3.6 BEDDING SAND

- .1 Place and spread bedding sand as indicated
- .2 Maximum thickness after compaction: 25 mm as per landscape details.
- .3 Use material other than bedding sand to compensate for depressions that exceed specified tolerances in surface of base.
- .4 Do not use joint sand for bedding sand.

3.7 SURFACE COURSE

- .1 Ensure bedding sand and granular base are not saturated prior to placement of unit pavers.
- .2 Install unit paving true to grade on the bedding sand, in location, layout and pattern as indicated.
- .3 Where required, cut units accurately without damaging edges.
- .4 Precast concrete paving slabs.
 - .1 Install paving slabs with 5 mm wide joints.
 - .2 For vehicular areas, use cut pieces no smaller than one-third of a whole paver.
 - .3 Compact and level slabs with min. 22 kN force mechanical plate vibrator [use minimum 19 slabs until units are true to grade and free of movement.
 - .4 Do not compact unit paving within 1 m of unrestrained edges.
 - .5 Fill spaces between pavers by sweeping in sand.
 - .6 Pass mechanical plate vibrator over unit paving to achieve compaction of sand in joints. Ensure joints are full at completion of compaction.
 - .7 At completion of each work day, ensure work within 1 m of laying face is left fully compacted with sand filled joints.
 - .8 Surface of finished pavement: free from depressions exceeding 3 mm as measured with 3 m straight edge.
 - .9 Sweep surface clean and check final elevations for conformance to drawings.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 This Section includes outline specifications for materials and installation of standard manufactured catalogue items and custom made furnishings which includes:
 - .1 Benches, bike racks
 - .2 Timber seating stumps/logs at grade,
Play equipment:
 - .1 Metal slide
 - .2 Musical play panels
 - .3 Sand box

1.2 REFERENCE STANDARDS

- .1 CSA International
 - .1 CAN/CSA-Z809-08, Sustainable Forest Management.
 - .2 CAN/CSA-A23.1, Concrete Materials and Methods of Concrete Construction
 - .3 G40.20-13/G40.21-13, Rolled or Welded Structural Quality Steel/Structural Quality Steels
 - .4 ASTM F1267-12, Metal, Expanded, Steel
- .2 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001-[2004], FSC Principle and Criteria for Forest Stewardship.
- .3 Sustainable Forestry Initiative (SFI)
 - .1 SFI-[2010-2014] Standard.

1.3 PRICE AND PAYMENT PROCEDURES

- .1 Allowances: Section 01 21 00 - Quantity allowances affecting this section.
 - .1 Allowance includes purchase, delivery, and installation of all off the shelf furnishing elements as well as custom made site furniture.
- .2 Unit Prices: Section 01 22 10 - Measurement of quantities & payment procedures affecting this section.
 - .1 Site furniture: by the unit, includes purchase, delivery, and installation.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Provide manufacturer's instructions, printed product literature and data sheets for furniture and include product characteristics, performance criteria, physical size, finish and limitations.

- .2 Refer to the landscape furniture schedule and the furnishing details and cut sheets in the Landscape set of drawings for product cutsheets and proposed product design.
- .3 Shop Drawings:
 - .1 Submit shop drawings for all furniture items indicating dimensions, sizes, assembly, anchorage and installation details for each furnishing specified.
 - .2 Wood Certification: Provide manufacturer's Chain-of-Custody Certificate number for CAN/CSA-Z809 or FSC or SFI certified wood.

1.5 CLOSEOUT SUBMITTALS

- .1 Provide maintenance data for care and cleaning of site furnishings for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.6 QUALITY ASSURANCE

- .1 Sustainable Standards Certification:
 - .1 Certified Wood: Provide listing of wood products and materials used in accordance with CAN/CSA-Z809 or FSC or SFI.
 - .2 Concrete: Provide listing of concrete products and materials used in accordance with CAN/CSA-A23.1
 - .3 Galvanized steel: Provide listing of steel products and materials used in accordance with G40.20-13/G40.21-13
 - .4 Metals: Provide listing of metal products and materials used in accordance with ASTM F1267-12

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials in dry location, indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect furnishings from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 SCHEDULE OF FURNISHING ELEMENTS

- .1 Material and finishes, manufacturer, model, color, size and quantity of all landscape site furniture elements, refer to landscape set for the Materials and Furnishings Schedule

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for exterior site furnishing installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate and inform consultant of unacceptable conditions immediately upon discovery.
 - .2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from consultant.

3.2 PREPARATION

- .1 Locate and protect utility lines.
- .2 Notify and acquire written acknowledgement from utility authorities before beginning installation Work

3.3 INSTALLATION

- .1 Assemble furnishings in accordance with manufacturer's written recommendations.
- .2 Touch-up damaged finishes to approval of consultant

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.5 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by site furnishings installation.

END OF SECTION

Part 1 General

1.1 MATERIAL SPECIFIED BY CONSULTANT

- .1 Contractor will supply topsoil delivered to job site available for pickup 100 miles from job site.

1.2 RELATED REQUIREMENTS

- .1 Section 31 05 13 - Soil Materials: Topsoil material.
- .2 Section 31 22 19 - Finish Grading: Preparation of subsoil and placement of topsoil in preparation for the work of this Section.
- .3 Section 31 23 23 - Backfilling: Rough grading of site.
- .4 Section 32 84 10 - Landscape Irrigation.
- .5 Section 32 91 19.13 - Topsoil Placement and Grading.
- .6 Section 32 93 43.01 - Tree Pruning.

1.3 MEASUREMENT PROCEDURES

- .1 Preparation of sub-grade for placing of topsoil will be measured in square feet of area prepared.
- .2 Topsoil stripping will be measured by Contractor and approved by consultant in cubic feet of stockpiled topsoil and volume will be determined by average end area method.
- .3 Measure placing of topsoil in cubic metres removed from stockpile.
 - .1 Stockpiles will be measured by Contractor and approved by consultant and volume of topsoil removed calculated by average end area method.
- .4 Measure supply and application of soil amendments, including fertilizer, in standard commercial units of weight/volume as determined by Consultant.
- .5 Measure supplying, placing and spreading topsoil in cubic metres determined by truck box measurement as loaded.
 - .1 Truck box capacity determined by Contractor.
- .6 Measure supplying, placing and spreading topsoil in cubic metres as determined from actual surface area covered and depth of topsoil specified.
 - .1 Specified depth of topsoil: measured and approved by Consultant after settlement and consolidation as specified.
- .7 Measure finish grading in square feet from actual surface measurements as determined by Consultant.

1.4 PAYMENT

- .1 Testing of topsoil: Owner will pay for cost of tests as specified in Section 01 29 83 - Payment Procedures for Testing Laboratory Services.

1.5 REFERENCE STANDARDS

- .1 Agriculture and Agri-Food Canada
 - .1 The Canadian System of Soil Classification, Third Edition, 1998.
- .2 Canadian Council of Ministers of the Environment
 - .1 PN1340-[2005], Guidelines for Compost Quality.

1.6 DEFINITIONS

- .1 Compost:
 - .1 Mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil conditioner.
 - .2 Compost is processed organic matter containing 40% or more organic matter as determined by Walkley-Black or Loss On Ignition (LOI) test.
 - .3 Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio below (25) (50)), and contain no toxic or growth inhibiting contaminants.
 - .4 Composed bio-solids to: CCME Guidelines for Compost Quality, Category (A) (B).

1.7 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Quality control submittals:
 - .1 Soil testing: submit certified test reports showing compliance with specified performance characteristics and physical properties as described in PART 2 - SOURCE QUALITY CONTROL.
 - .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.8 QUALITY ASSURANCE

- .1 Pre-installation meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements in accordance with Section 01 32 16.06 - Construction Progress Schedule - Critical Path Method (CPM) or 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart.

1.9 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse or recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Divert unused soil amendments from landfill to official hazardous material collections site approved by Consultant or Departmental Representative.
- .3 Do not dispose of unused soil amendments into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

Part 2 Products

2.1 TOPSOIL

- .1 Topsoil for planting beds mixture of particulates, micro-organisms and organic matter which provides suitable medium for supporting intended plant growth.
 - .1 Soil texture based on The Canadian System of Soil Classification, to consist of 20 to 70 % sand, minimum 7 % clay, and contain 2 to 10 % organic matter by weight.
 - .2 Contain no toxic elements or growth inhibiting materials.
 - .3 Finished surface free from:
 - .1 Debris and stones over 50 mm diameter.
 - .2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.
 - .4 Consistence: friable when moist.

2.2 SOIL AMENDMENTS

- .1 Fertilizer:
 - .1 Fertility: major soil nutrients present in following amounts:
 - .2 Nitrogen (N): 20 to 40 micrograms of available N per gram of topsoil.
 - .3 Phosphorus (P): 40 to 50 micrograms of phosphate per gram of topsoil.
 - .4 Potassium (K): 75 to 110 micrograms of potassium per gram of topsoil.
 - .5 Calcium, magnesium, sulphur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.
 - .6 Ph value: 6.5 to 8.0.
- .2 Peatmoss:
 - .1 Derived from partially decomposed species of Sphagnum Mosses.
 - .2 Elastic and homogeneous, brown in colour.
 - .3 Free of wood and deleterious material which could prohibit growth.
 - .4 Shredded particle minimum size: 0.2 inches.
- .3 Sand: washed coarse silica sand, medium to course textured.
- .4 Organic matter: compost Category A or B in accordance with CCME PN1340, unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements.
- .5 Use composts meeting Category B requirements for land fill reclamation and large scale industrial applications.
- .6 Limestone:
 - .1 Ground agricultural limestone.
 - .2 Gradation requirements: percentage passing by weight, 90% passing 0.04 inch sieve, 50% passing 0.005 inch sieve.

- .7 Fertilizer: industry accepted standard medium containing nitrogen, phosphorous, potassium and other micro-nutrients suitable to specific plant species or application or defined by soil test.

2.3 SOURCE QUALITY CONTROL

- .1 Advise Consultant of sources of topsoil or manufactured topsoil to be utilized with sufficient lead time for testing.
- .2 Contractor is responsible for amendments to supply topsoil as specified.
- .3 Soil testing by recognized testing facility for PH, P and K, and organic matter.
- .4 Testing of topsoil will be carried out by testing laboratory designated by Contractor and approved by Consultant.
 - .1 Soil sampling, testing and analysis to be in accordance with Provincial standards.

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 STRIPPING OF TOPSOIL

- .1 Begin topsoil stripping of areas as directed by Consultant after area has been cleared of brush and grasses and weeds and removed from site.
- .2 Strip topsoil to depths as directed by Consultant.
 - .1 Avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended application.
- .3 Stockpile in locations as directed by Consultant or Departmental Representative.
 - .1 Stockpile height not to exceed 6.7 feet.
- .4 Disposal of unused topsoil is to be in an environmentally responsible manner but not used as landfill as directed Departmental Representative or Consultant.
- .5 Protect stockpiles from contamination and compaction.

3.3 PREPARATION OF EXISTING GRADE

- .1 Verify that grades are correct.
 - .1 If discrepancies occur, notify Consultant and do not commence work until instructed by Consultant.

- .2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.
- .3 Remove debris, roots, branches, stones in excess of 2 inches diameter and other deleterious materials.
 - .1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.
 - .2 Remove debris which protrudes more than 3 inches above surface.
 - .3 Dispose of removed material off site.
- .4 Cultivate entire area which is to receive topsoil to minimum depth of 4 inches.
 - .1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.4 PLACING AND SPREADING OF TOPSOIL/PLANTING SOIL

- .1 Place topsoil after Consultant]has accepted subgrade.
- .2 Spread topsoil in uniform layers not exceeding 6 inches.
- .3 Spread topsoil as indicated on drawings to minimum depths after settlement.
- .4 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

3.5 SOIL AMENDMENTS

- .1 For planting beds: apply and thoroughly mix soil amendments into full specified depth of topsoil to conform with current edition of CSLA Landscape standards.

3.6 FINISH GRADING

- .1 Grade to eliminate rough spots and low areas and ensure positive drainage.
 - .1 Prepare loose friable bed by means of cultivation and subsequent raking.
- .2 Consolidate topsoil to required bulk density using equipment approved by Consultant.
 - .1 Leave surfaces smooth, uniform and firm against deep footprinting.

3.7 ACCEPTANCE

- .1 Consultant will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

3.8 SURPLUS MATERIAL

- .1 Dispose of materials except topsoil not required off site where directed by Consultant or Departmental Representative.

3.9 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Placing of subsoil.
- .2 Fertilizing.
- .3 Sod installation.
- .4 Maintenance.

1.2 RELATED SECTIONS

- .1 Section 32 93 10 - Trees, Shrubs And Ground Cover Planting.

1.3 PRICE AND PAYMENT PROCEDURES

- .1 Topsoil: By the cubic metre. Includes topsoil, placing topsoil.
- .2 Sodded Areas: By the square metre. Includes preparation of topsoil, placing topsoil, sodding, watering and maintenance to specified time limit.

1.4 REFERENCES

- .1 ASPA (American Sod Producers Association) - Guideline Specifications to Sodding.

1.5 DEFINITIONS

- .1 Weeds: Includes Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

1.6 ADMINISTRATIVE REQUIREMENTS

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.
 - .2 Coordinate with installation of underground sprinkler system piping and watering heads.
- .3 Sequencing: Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.7 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Sustainable Design:
 - .1 Section 01 35 18: LEED documentation procedures.
 - .2 Provide required LEED documentation for Product [regional materials].

- .3 Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.8 CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.
- .2 Maintenance Contracts:
 - .1 Provide service and maintenance of sodded areas for three (3) months from Date of Substantial Completion.
 - .2 Maintain seeded areas immediately after placement until grass is well established and exhibits a vigorous growing condition.
- .3 Operation Data: Submit for continuing Owner maintenance.
- .4 Maintenance Data: Include maintenance instructions, cutting method and maximum grass height; [types, application frequency, and recommended coverage of fertilizer].

1.9 QUALITY ASSURANCE

- .1 Sod: Minimum age of eighteen (18) months, with root development that will support its own weight without tearing, when suspended vertically by holding the upper two corners.
- .2 Submit sod certification for grass species and location of sod source.
- .3 Sod Producer: Company specializing in sod production and harvesting with minimum five (5) years experience, and certified by the Province of British Columbia.
- .4 Installer: Company approved by the sod producer.

1.10 REGULATORY REQUIREMENTS

- .1 Comply with regulatory agencies for fertilizer composition.
- .2 Provide certificate of compliance from City of Richmond indicating approval of fertilizer mixture.

1.11 DELIVERY, STORAGE, AND PROTECTION

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Deliver sod on in rolls. Protect exposed roots from dehydration.
- .3 Do not deliver more sod than can be laid within twenty-four (24) hours.

Part 2 Products

2.1 MATERIALS

- .1 Sod: Sod to be Canada No. 1 nursery grown turf from seed, free of diseases, clovers, stones, pests, debris and containing no more than two broadleaf weeds or ten other weeds per 42 m² (50 yd²).
- .2 Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay, or impurities, plants, weeds and roots; pH value of minimum [5.4] and maximum [7.0].

- .3 Topsoil: Excavated from site and free of weeds.
- .4 Fertilizer: Type recommended for soil and grass, with 50% of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil as indicated in analysis.
- .5 Fertilizer: Type recommended for soil and grass, with 50% of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil.
- .6 Water: Clean, fresh and free of substances or matter which could inhibit vigorous growth of grass.

2.2 ACCESSORIES

- .1 Wood Pegs: Softwood, sufficient size and length to ensure anchorage of sod on slope.
- .2 Wire Mesh: Interwoven hexagonal metal wire or plastic mesh of 50 mm size.
- .3 Edging: Plastic or Galvanized Steel.
- .4 Herbicide: only as directed and approved.

2.3 HARVESTING SOD

- .1 Machine cut sod to ASPA Guidelines.
- .2 Cut sod in area not exceeding 1 sq m with minimum 13 mm and maximum 25 mm topsoil base.

2.4 SOURCE QUALITY CONTROL

- .1 Section 01 43 00: Manufacturer quality control.
- .2 Provide mix formulation for fertilizer.
- .3 Analyse to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.
- .4 Submit minimum sample of topsoil proposed. Forward sample to approved testing laboratory in sealed containers to prevent contamination.
- .5 Testing is not required if recent tests are available for imported topsoil. Submit these test results to the testing laboratory for approval. Indicate, by test results, information necessary to determine suitability.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify that prepared soil base is ready to receive the work of this section.

3.2 PREPARATION OF SUBSOIL

- .1 Prepare subsoil and eliminate uneven areas and low spots.

- .2 Maintain lines, levels, profiles and contours. Make changes in grade gradual. Blend slopes into level areas.
- .3 Remove foreign materials and undesirable plants and their roots. Do not bury foreign material beneath areas to be sodded.
- .4 Remove contaminated subsoil.
- .5 Scarify subsoil to a depth of 100 mm where topsoil is to be placed.
- .6 Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted subsoil.

3.3 PLACING TOPSOIL

- .1 Spread topsoil to a minimum depth of 50 mm over area to be sodded.
- .2 Place topsoil during dry weather and on dry unfrozen subgrade.
- .3 Remove vegetable matter and foreign non-organic material from topsoil while spreading.
- .4 Grade topsoil to eliminate rough, low or soft areas, and to ensure positive drainage.
- .5 Install edging at periphery of sodded areas in straight lines to consistent depth.

3.4 FERTILIZING

- .1 Apply fertilizer at rate recommended by manufacturer.
- .2 Apply after smooth raking of topsoil and prior to installation of sod.
- .3 Apply fertilizer no more than forty-eight (48) hours before laying sod.
- .4 Mix thoroughly into upper 50 mm of topsoil.
- .5 Lightly water to aid the dissipation of fertilizer.

3.5 LAYING SOD

- .1 Moisten prepared surface immediately prior to laying sod.
- .2 Lay sod within twenty-four hours after harvesting to prevent deterioration.
- .3 Lay sod tight with no open joints visible, and no overlapping; stagger end joints 300 mm minimum. Do not stretch or overlap sod pieces.
- .4 Lay smooth. Align with adjoining grass areas.
- .5 Place top elevation of sod 13mm below adjoining edging/paving/curbs.
- .6 On slopes [1:2] and steeper, lay sod perpendicular to slope and secure every row with wooden pegs at maximum 600 mm on centre. Drive pegs flush with soil portion of sod.
- .7 Prior to placing sod, where indicated place wire mesh over topsoil. Securely anchor in place with wood pegs sunk firmly into the ground.
- .8 Water sodded areas immediately after installation. Saturate sod to 100 mm of soil.
- .9 After sod and soil have dried, roll sodded areas to ensure good bond between sod and soil and to remove minor depressions and irregularities.

3.6 MAINTENANCE

- .1 Mow grass at regular intervals to maintain at a maximum height of 65 mm. Do not cut more than 1/3 of grass blade at any one mowing.
- .2 Neatly trim edges and hand clip where necessary.
- .3 Immediately remove clippings after mowing and trimming.
- .4 Water to prevent grass and soil from drying out.
- .5 Roll surface to remove minor depressions or irregularities.
- .6 Control growth of weeds. Apply herbicides in accordance with manufacturer's written instructions. Remedy damage resulting from improper use of herbicides.
- .7 Immediately replace sod to areas which show deterioration or bare spots.
- .8 Protect sodded areas with warning signs during maintenance period.

3.7 SCHEDULES

- .1 Rear Yard Sodded Area: Sod grass mixture specified except substitute Clover for Kentucky Blue Grass, 50 mm top soil.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Preparation of topsoil.
- .2 Topsoil bedding.
- .3 Trees, Plants, Ground cover, new.
- .4 Mulch and Fertilizer.
- .5 Maintenance.
- .6 Tree Pruning.

1.2 PRICE AND PAYMENT PROCEDURES

- .1 Allowances affecting this section:
 - .1 Allowance includes purchase, delivery, and installation of trees, plants, and ground cover.
- .2 Unit Prices: Section 01 22 10 - Measurement of quantities affecting this section.
 - .1 Topsoil: By the cubic metre. Includes topsoil, placing topsoil.
 - .2 Plants: By the unit. Includes preparation of topsoil, planting, watering and maintenance to specified time period.

1.3 REFERENCES

- .1 NAA (National Arborist Association) - Pruning Standards for Shade Trees.

1.4 DEFINITIONS

- .1 Weeds: Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.
- .2 Weeds: Any plant life not specified [or scheduled].
- .3 Plants: Living trees, plants, and ground cover specified in this Section.

1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.
 - .2 Install plant life after and coordinate with installation of underground irrigation system piping and watering heads specified in Section [32 84 10].

1.6 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.

1.7 CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.
- .2 Maintenance Contracts:
 - .1 Maintain plant life for three (3) months after Date of Substantial Completion.
 - .2 Maintain plant life immediately after placement until plants are well established and exhibit a vigorous growing condition. Continue maintenance until termination of warranty period.
- .3 Maintenance to include:
 - .1 Cultivation and weeding plant beds and tree pits.
 - .2 Applying herbicides for weed control in accordance with manufacturer's written instructions. Remedy damage resulting from use of herbicides.
 - .3 Remedy damage from use of insecticides.
 - .4 Irrigating sufficient to saturate root system.
 - .5 Pruning, including removal of dead or broken branches, and treatment of pruned areas or other wounds.
 - .6 Disease control.
 - .7 Maintaining wrapping, guys, and stakes. Repair or replace accessories when required.
 - .8 Replacement of mulch.
- .4 Maintenance Data: Include cutting and trimming method; types, application frequency, and recommended coverage of fertilizer.
- .5 Plant Source: Submit list of plant life sources.

1.8 QUALITY ASSURANCE

- .1 Workmanship and materials must conform to the latest edition of Guide Specification for Nursery Stock as published by the Canadian Nursery Trades Association (CNTA) and Guide Specification for Landscape Construction as published by the BC Nursery Trade Association (BCNTA).
- .2 Nursery Qualifications: Company specializing in growing and cultivating the plants with minimum three (3) years experience.
- .3 Installer Qualifications: Company specializing in installing and planting the plants with minimum three (3)] years experience and approved by nursery and Landscape Consultant.
- .4 Tree Pruner Qualifications: Company specializing in pruning trees with proof of Arborist Certification.
- .5 Tree Pruning: [NAA] - Pruning Standards for Shade Trees.
- .6 Maintenance Services: Performed by installer.

1.9 REGULATORY REQUIREMENTS

- .1 Comply with regulatory agencies for fertilizer composition.
- .2 Provide certificate of compliance from City of Richmond indicating approval of plants, fertilizer mixture.
- .3 Plant Materials free of disease or hazardous insects.

1.10 DELIVERY, STORAGE, AND PROTECTION

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.
- .3 Protect and maintain plant life until planted.
- .4 Deliver plant life materials immediately prior to placement. Keep plants moist.

1.11 ENVIRONMENTAL REQUIREMENTS

- .1 Section 01 35 26: Environmental conditions affecting products on site.
- .2 Do not install plant life when ambient temperatures may drop below 2 degrees C or rise above 32 degrees C.
- .3 Do not install plant life when wind velocity exceeds 48 k/hr.

1.12 WARRANTY

- .1 Section 01 78 10: Warranties.
- .2 Provide one (1) year warranty.
- .3 Warranty: Include coverage for one continuous growing season; replace dead or unhealthy plants.
- .4 Replacements: Plants of same size and species as specified, planted in the next growing season, with a new warranty commencing on date of replacement.

Part 2 Products

2.1 TREES, PLANTS, AND GROUND COVER

- .1 Species and size identifiable in plant schedule, grown in climatic conditions similar to those in locality of the Work.

2.2 SOIL MATERIALS

- .1 Topsoil: As specified in Section 31 05 13.
- .2 Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay or impurities, plants, weeds and roots; minimum pH value of [5.4] and maximum [7.0].

2.3 SOIL AMENDMENT MATERIALS

- .1 Fertilizer: Containing 50% of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil as indicated in analysis.
- .2 Fertilizer: Containing 50% of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil to the following proportions: nitrogen, phosphoric acid, soluble potash.
- .3 Peat Moss: Shredded, loose, sphagnum moss; free of lumps, roots, inorganic material or acidic materials; minimum of [85%] organic material measured by oven dry weight, pH range of [4 to 5]; moisture content of [30%].
- .4 Bone Meal: Raw, finely ground, commercial grade, minimum of 3% nitrogen and 20% phosphorous.
- .5 Lime: Ground limestone, dolomite type, minimum 95% carbonates.
- .6 Water: Clean, fresh, and free of substances or matter which could inhibit vigorous growth of plants.

2.4 MULCH MATERIALS

- .1 Mulching Material: wood shavings, free of growth or germination inhibiting ingredients.
- .2 Mulching Material: Oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry.

2.5 ACCESSORIES

- .1 Wrapping Materials: Burlap.
- .2 Stakes: Softwood lumber, pointed end.
- .3 Cable, Wire, Eye Bolts [and Turnbuckles]: Non-corrosive, of sufficient strength to withstand wind pressure and resulting movement of plant life.
- .4 Plant Protectors: Rubber sleeves over cable to protect plant stems, trunks, and branches.
- .5 Grates: Cast steel, galvanized finish, with grill design as indicated, square, sized to City of New Westminster standards.
- .6 Tree Protectors: Plastic with galvanized rings.

2.6 PLANT SOIL MIX

- .1 A uniform mixture of one (1) part peat and three (3) parts topsoil by volume.

2.7 SOURCE QUALITY CONTROL AND TESTS

- .1 Section 01 43 00: Provide mix design for soil.
- .2 Provide analysis of imported topsoil.
- .3 Analyse to ascertain percentage of nitrogen, phosphorus, potash, soluble salt and organic matter; pH value.
- .4 Submit sample of topsoil proposed. Forward sample to testing laboratory in sealed containers to prevent contamination.

- .5 Testing is not required if recent tests are available for imported topsoil. Submit these test results to the testing laboratory for approval. Indicate, by test results, information necessary to determine suitability.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify that prepared subsoil and planters are ready to receive work.
- .3 Saturate soil with water to test drainage.
- .4 Verify required underground utilities are available, in proper location, and ready for use.

3.2 PREPARATION OF SUBSOIL

- .1 Prepare subsoil to eliminate uneven areas. Maintain profiles and contours. Make changes in grade gradual. Blend slopes into level areas.
- .2 Remove foreign materials, weeds and undesirable plants and their roots. Remove contaminated subsoil.
- .3 Scarify subsoil to a depth of 75 mm where plants are to be placed. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted subsoil.
- .4 Dig pits and beds 150 mm larger than plant root system.

3.3 PLACING TOPSOIL

- .1 Spread topsoil to a minimum depth of 150 mm over area to be planted. Rake smooth.
- .2 Place topsoil during dry weather and on dry unfrozen subgrade.
- .3 Remove vegetable matter and foreign non-organic material from topsoil while spreading.
- .4 Grade topsoil to eliminate rough, low or soft areas, and to ensure positive drainage.
- .5 Install topsoil into pits and beds intended for root balls, to a min. thickness of 150mm.

3.4 FERTILIZING

- .1 Apply fertilizer at rate recommended by manufacturer.
- .2 Apply after initial raking of topsoil.
- .3 Mix thoroughly into upper 50 mm of topsoil.
- .4 Lightly water to aid the dissipation of fertilizer.

3.5 PLANTING

- .1 Place plants for best appearance for review and final orientation by Consultant.
- .2 Set plants vertical.
- .3 Remove non-biodegradable root containers.

- .4 Set plants in pits or beds, partly filled with prepared plant mix, at a minimum depth as indicated on Drawings under each plant. Remove/loosen burlap, ropes, and wires, from the root ball.
- .5 Place bare root plant materials so roots lie in a natural position. Backfill soil mixture in 150 mm layers. Maintain plant life in vertical position.
- .6 Saturate soil with water when the pit or bed is half full of topsoil and again when full.

3.6 PLANT RELOCATION AND RE-PLANTING

- .1 Relocate plants as directed by Landscape Consultant.
- .2 Re-plant plants in pits or beds, partly filled with prepared topsoil mixture, at a minimum depth as indicated on Drawings under each plant. Remove/loosen burlap, ropes, and wires, from the root ball.
- .3 Place bare root plant materials so roots lie in a natural position. Backfill soil mixture in 150 mm layers. Maintain plant materials in vertical position.
- .4 Saturate soil with water when the pit or bed is half full of topsoil and again when full.

3.7 INSTALLATION OF ACCESSORIES

- .1 Place grates at base of trees where indicated on Drawings.
- .2 Wrap deciduous shade and flowering tree trunks and place tree protectors.

3.8 PLANT SUPPORT

- .1 Brace plants vertically with plant protector wrapped guy wires and stakes to the following tree caliper and support method:
 - .1 25 mm, one (1) stake with one (1) tie.
 - .2 25 to 50 mm, two (2) stakes with two (2) ties.
 - .3 50 to 100 mm, three (3) guy wires [with eye bolts and turn buckles].
 - .4 Over 100 mm, four (4) guy wires [with eye bolts and turn buckles].

3.9 TREE PRUNING

- .1 Prune trees to [NAA] Class [2 - Medium Pruning].

3.10 FIELD QUALITY CONTROL

- .1 Section 01 45 00: Field inspection
- .2 Plants will be rejected if a ball of earth surrounding roots has been disturbed or damaged prior to or during planting.

3.11 MAINTENANCE

- .1 Neatly trim plants where necessary.
- .2 Immediately remove clippings after trimming.
- .3 Water to prevent soil from drying out.
- .4 Control growth of weeds. Apply herbicides only if directed.

- .5 Apply pesticides in accordance with manufacturers written instructions.

END OF SECTION

Part 1 General

1.1 MEASUREMENT PROCEDURES

- .1 Measure tree pruning for payment per tree.

1.2 REFERENCE STANDARDS

- .1 American National Standard Institute (ANSI)
 - .1 ANSI A300 (Part 1)-2001, Tree Care Operations - Tree, Shrub and Other Woody Plant Maintenance - Standard Practices (revision and re-designation of ANSI A300-1995) (includes supplements).
 - .2 ANSI A300 (Part 2)-1998, Tree Care Operations - Tree, Shrub, and Other Woody Plant Maintenance - Standard Practices - Part 2 - Fertilization.
 - .3 ANSI A300 (Part 3)-2000, Tree Care Operations - Tree, Shrub and Other Woody Plant Maintenance: Standard Practices - Part 3 - Tree Support Systems (a. Cabling, Bracing, and Guying) (supplement to ANSI A300-1995).
- .2 Canadian Nursery Landscape Association (CNLA)
- .3 International Society of Arboriculture (ISA)
- .4 Ontario Ministry of Agriculture, Food and Rural Affairs
 - .1 Publication 483-2004, Pruning Ornamentals.

1.3 DEFINITIONS

- .1 Crown Cleaning: consists of selective removal of one or more of following items: dead, dying or diseased branches, weak branches and water sprouts.
- .2 Crown Thinning: consists of selective removal of branches to increase light penetration, air movement and reduce weight.
- .3 Crown Raising: consists of removal of lower tree branches to provide clearance.
- .4 Crown Reduction or Crown Shaping: decreases tree height and/or spread.
- .5 Vista Pruning: is selective thinning of framework limbs or specific crown areas to improve views.
- .6 Crown Restoration: improves structure, form and appearance of trees that have been severely headed or vandalized.

1.4 QUALITY ASSURANCE

- .1 Certification: provide Canadian Nursery Landscape Association and International Society of Arboriculture certification.
- .2 Regulatory requirements: provide safety certificate as approved by local hydro utility.
- .3 Field Samples: do sample pruning in manner to enable Consultant to identify:
 - .1 Knowledge of target areas including branch bark ridge and branch collars.
 - .2 Technique for selection process and pruning used to establish desired form and shape for each species.

- .4 Acceptance of Work will be determined by Consultant from field sample.
- .5 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse & recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic in designated containers.
- .3 Dispose of unused disinfectant at official hazardous material collections site approved by Consultant.
- .4 Ensure emptied containers are sealed and stored safely.
- .5 Divert wood materials from landfill to facility for composting & recycling as directed by Consultant.

1.6 TOOL MAINTENANCE

- .1 Ensure that tools are clean and sharp throughout pruning operation: do not use tools that crush or tear bark.
- .2 Disinfect tools before each tree is pruned.
- .3 On diseased plant material disinfect tools before each cut.

Part 2 Products

2.1 DISINFECTANT

- .1 20% solution of sodium hypochlorite or 70% solution of ethyl alcohol.

Part 3 Execution

3.1 APPLICATION

- .1 Manufacturer's instructions: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.2 GENERAL

- .1 Prune in accordance with Pruning Ornamentals, and as directed by Consultant. Where discrepancies occur between standard and specifications, specifications govern.
- .2 Notify immediately the Consultant with conditions detrimental to health of plant material or operations.
- .3 Prune during plant dormant period or after leaves have matured. Avoid pruning during leaf formation, at time of leaf fall, or when seasonal temperature drops below 14 degrees F.
- .4 Prune each species when in full leaf.

- .5 Retain natural form and shape of plant species.
- .6 Do not:
 - .1 Flush cut branches.
 - .2 Crush or tear bark.
 - .3 Cut behind branch bark ridge.
 - .4 Damage branch collars.
 - .5 Damage branches to remain.

3.3 PRUNING

- .1 Remove dead, dying, diseased and weak growth from plant material to provide clear crown reduction, crown raising, crown restoration, crown thinning, vista pruning or crown cleaning depending on what is most suitable for the specific situation in order to promote healthy growth.
- .2 Remove live branches that:
 - .1 Interfere with healthy development and structural strength including branches crossed or rubbing more important branches.
 - .2 Are of weak structure including narrow crotches.
 - .3 Obstruct development of more important branches.
 - .4 Are broken.
- .3 Remove live branches to re-establish natural species form including:
 - .1 One or more developing leaders.
 - .2 Multiple growth due to previous topping.
 - .3 Branches extending outward from natural form.
 - .4 Undesirable sucker growth.
- .4 Remove loose branches, twigs and other debris lodged in tree.
- .5 Remove vines.
- .6 For branches under 2 inches in diameter:
 - .1 Locate branch bark ridge and make cuts smooth and flush with outer edge of branch collar to ensure retention of branch collar. Cut target area to bottom of branch collar at angle equal to that formed by line opposite to branch bark ridge.
 - .2 Make cuts on dead branches smooth and flush with swollen callus collar. Do not injure or remove callus collar.
 - .3 Do not cut lead branches unless directed by Consultant.
- .7 For branches greater than 2 inches in diameter:
 - .1 Make first cut on lower side of branch 12 inches from trunk, one third diameter of branch.
 - .2 Make second cut on upper side of branch 20 inches from trunk until branch falls off.
 - .3 Make final cut adjacent to and outside branch collar.

- .8 Ensure that trunk bark and branch collar are not damaged or torn during limb removal.
- .1 Repair areas which are damaged, or remove damaged area back to next branch collar.
- .9 Remove additional growth designated by Consultant

3.4 ROOT GIRDLING

- .1 For girdling roots one-quarter size of trunk diameter or larger, V-cut girdling root one-half way through at point where root is crossing.
- .2 Remove exposed portion of girdling root as directed by Consultant after cleanly cutting root flush with grade on each side of parent root. Do not injure bark or parent root.

3.5 CARE OF WOUNDS

- .1 Shape bark around wound to oblong configuration ensuring minimal increase in wound size. Retain peninsulas of existing live bark.

3.6 CLEAN-UP

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Collect and compost/recycle whenever applicable or dispose of pruned material daily and remove from site.
- .3 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION