

## **Part 1      General**

### **1.1      Section Include**

- .1      Materials and installation for chain link fences and gates.

### **1.2      Related Sections**

- .1      Section 01 33 00 - Submittal Procedures.
- .2      Section 01 35 30 - Health and Safety Requirements.
- .3      Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .4      Section 02 61 33 - Hazardous Materials.
- .5      Section 03 10 00 – Concrete Forms and Accessories.
- .6      Section 32 91 21 – Topsoil Placement and Grading.

### **1.3      Measurement Procedures**

- .1      Measure supply and erection of chain link fence in metres erected.

### **1.4      References**

- .1      American Society for Testing and Materials International, (ASTM).
  - .1      ASTM A53/A53M-02, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
  - .2      ASTM A90/A90M-01, Standard Test Method for Weight Mass of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
  - .3      ASTM A121-99, Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.
  - .4      A653/A653M-03, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .5      ASTM C618-03, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
  - .6      ASTM F1664-01, Standard Specification for Poly(Vinyl Chloride) (PVC)-Coated Steel Tension Wire Used with Chain-Link Fence.
- .2      Canadian General Standards Board (CGSB).
  - .1      CAN/CGSB-138.1-96, Fabric for Chain Link Fence.
  - .2      CAN/CGSB-138.2-96, Steel Framework for Chain Link Fence.
  - .3      CAN/CGSB-138.3-96, Installation of Chain Link Fence.
  - .4      CAN/CGSB-138.4-96, Gates for Chain Link Fence.
  - .5      CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
- .3      Canadian Standards Association (CSA International).

- .1 CAN/CSA-A23.1/A23.2-00(August 2001), Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.
- .2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .3 CAN/CSA-A3000-98(R2002), Cementitious Materials Compendium. Includes:
  - .1 CAN/CSA-A23.5-98, Supplementary Cementing Materials
- .4 Department of Justice Canada (Jus).
  - .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
  - .1 Material Safety Data Sheets (MSDS).
- .6 The Master Painters Institute (MPI) - Architectural Painting Specification Manual - March 1998.
  - .1 MPI # 18, Organic Zinc Rich Primer.
- .7 Transport Canada (TC).
  - .1 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

## **1.5 Submittals**

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures .
- .2 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 61 33 - Hazardous Materials.

## **1.6 Health and Safety**

- .1 Do construction occupational health and safety in accordance with Section 01 35 30 - Health and Safety Requirements.

## **1.7 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, plastic, polystyrene, and corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .4 Separate for reuse and recycling and place in designated containers Steel, Metal, and Plastic waste in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .5 Place materials defined as hazardous or toxic in designated containers.
- .6 Handle and dispose of hazardous materials in accordance with CEPA , TDGA , Regional and Municipal regulations.

- .7 Divert unused metal and wiring materials from landfill to metal recycling facility as approved by Contract Administrator.
- .8 Divert unused concrete materials from landfill to local facility as approved by Contract Administrator.
- .9 Unused paint or coating material must be disposed of at official hazardous material collections site as approved by Contract Administrator.
- .10 Do not dispose of unused paint material into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
- .11 Fold up metal banding, flatten and place in designated area for recycling.

## **Part 2 Products**

### **2.1 Materials**

- .1 Chain-link fence fabric: to CAN/CGSB-138.1.
  - .1 Type 1, Class A, to match existing style, Grade 2 or to match existing.
  - .2 Height of fabric: to match existing fence height (1220mm typ.).
- .2 Posts, braces and rails: to CAN/CGSB-138.2, galvanized steel pipe. Dimensions as indicated.
  - .1 2438mm O.C. spacing as shown.
- .3 Tension Bar – top and bottom: to ASTM A653/A653M, 5 x 20 mm minimum galvanized steel.
- .4 Gates: to CAN/CGSB-138.4.
- .5 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.
- .6 Fittings and hardware: to CAN/CGSB-138.2, galvanized steel.
  - .1 Tension bar bands: 3 x 20 mm minimum galvanized steel.
  - .2 Post caps to provide waterproof fit, to fasten securely over posts and to carry top rail.
- .7 Organic zinc rich coating: to CAN/CGSB-1.181 MPI #18.

## **2.2 Finishes**

- .1 Galvanizing:
  - .1 For chain link fabric: to CAN/CGSB-138.1 Grade 2.
  - .2 For pipe: 550 g/m<sup>2</sup> minimum to ASTM A90.
  - .3 For other fittings: to CAN/CSA-G164.

## **Part 3 Execution**

### **3.3 Grading**

- .1 Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts.
  - .1 Provide clearance between bottom of fence and ground surface of 30 mm to 50 mm.

### **3.4 Erection of Fence**

- .1 Erect fence along lines as indicated, as directed by Contract Administrator and to CAN/CGSB-138.3.
- .2 Excavate post holes to dimensions indicated depth x diameter to fit 300mm concrete forming tube and as directed by Contract Administrator.
  - .1 Refer to Section 03 10 00 – Concrete Forming and Accessories.
- .3 Space line posts 2438mm O.C. apart, measured parallel to ground surface.
- .4 Space straining posts at equal intervals not to exceed 150 m if distance between end or corner posts on straight continuous lengths of fence over reasonably smooth grade, is greater than 150 m.
- .5 Install additional straining posts at sharp changes in grade and where directed by Contract Administrator.
- .6 Install corner post where change in alignment exceeds 10 degrees.
- .7 Install end posts at end of fence and at buildings.
  - .1 Install gate posts on both sides of gate openings.
- .8 Place compacted gravel fill in post holes then embed posts into gravel to 914mm min.
  - .1 Refer to Section 31 05 10 – Corrected Maximum Dry Density for Fill and Section 32 91 21 – Top Soil Placement and Grading.
  - .2 Extend gravel 50 mm above ground level and slope to drain away from posts.
  - .3 Brace to hold posts in plumb position and true to alignment and elevation until set.
- .9 Install brace between end and gate posts and nearest line post, placed in centre of panel and parallel to ground surface.

- .1 Install braces on both sides of corner and straining posts in similar manner.
- .10 Install overhang tops and caps.
- .11 Install top and bottom rail between posts and fasten securely to posts and secure waterproof caps and overhang tops.
- .12 Lay out fence fabric. Stretch tightly to tension recommended by manufacturer and fasten to end, corner, gate and straining posts with tension bar secured to post with tension bar bands spaced at 300 mm intervals.
  - .1 Twisted selvedge at bottom.
  - .2 Twisted selvedge at top.
- .13 Secure fabric to top rails, line posts and bottom rail with tie wires at 450 mm intervals.
  - .1 Give tie wires minimum two twists.

### **3.5 Installation of Gates**

- .1 Install gates in locations as indicated and where directed by Contract Administrator.
- .2 Level ground between gate posts and set gate bottom approximately 40 mm above ground surface.

### **3.6 Cleaning**

- .1 Clean and trim areas disturbed by operations.
  - .1 Dispose of surplus material and replace damaged turf with sod as directed by Contract Administrator.
    - .1 Refer to Section 32 92 23 – Sodding.

**END OF SECTION**

**Part 1            General**

**1.1                SECTION INCLUDES**

- .1            Materials and installation of standard manufactured catalogue items: outdoor benches.

**1.2                RELATED SECTIONS**

- .1            Section 01 33 00 - Submittal Procedures.
- .2            Section 01 74 19 - Construction/Demolition Waste Management And Disposal.
- .3            Section 01 78 00 - Closeout Submittals.

**1.3                SUBMITTALS**

- .1            Submit product data as requested and shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2            Indicate dimensions, sizes, assembly, anchorage and installation details for each furnishing specified.
- .3            Provide maintenance data for care and cleaning of site furnishings for incorporation into manual(s) specified in Section 01 78 00 - Closeout Submittals.

**1.4                WASTE MANAGEMENT AND DISPOSAL**

- .1            Separate waste materials for recycling in accordance with Section [01 74 19 - 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, plastic, polystyrene, corrugated cardboard packaging material for recycling in accordance with Waste Management Plan.
- .4            Fold up metal banding, flatten and place in designated area for recycling.

**Part 2            Products**

**2.1                BENCH**

- .1            Acceptable Materials:
  - .1            End pieces: n/a.
  - .2            Seat: recycled plastic
  - .3            Frame and supports: steel.
- .2            Acceptable Products:
  - .1            Contour Series by Cascades Replast
  - .2            Alternates as approved by Contract Administrator

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- .3 Dimensions:
    - .1 Height: 860mm
    - .2 Length: 1830mm
    - .3 Depth: 610mm.
  - .4 Finish:
    - .1 Submit actual samples for colour selection upon request.
  - .5 Weight: 79.5 kg .

**Part 3 Execution**

**3.1 INSTALLATION**

- .1 Assemble in accordance with manufacturer's instructions.
- .2 Install anchored as indicated in manufacturer's instructions.
- .3 Touch-up damaged finishes to approval of Contract Administrator

**END OF SECTION**

## **Part 1      General**

### **1.1      Related Sections**

- .1      Section 01 29 83 - Payment Procedures: Testing Laboratory Services.
- .2      Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .3      Section 31 22 13 - Rough Grading.
- .4      Section 32 92 23 – Sodding.

### **1.2      Definitions**

- .1      **COMPOST:** A mixture of soil and decomposing organic matter used as a fertilizer, mulch, or soil conditioner. Compost is processed organic matter containing 40% or more organic matter as determined by the Walkley-Black or LOI test. 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. Composed bio-solids must meet the requirements of the Guidelines for Compost Quality, Category (A) (B) produced by the Canadian Council of the Ministers of the Environment (CCME), January 1996.

### **1.3      Quality Assurance**

- .1      **Test Reports:** certified test reports showing compliance with specified performance characteristics and physical properties.
- .2      **Certificates:** product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3      **Pre-Installation Meetings:** conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements.

### **1.4      Waste Management and Disposal**

- .1      Separate and recycle waste materials 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 Contract Administrator.
- .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.



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## **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 50mm diameter.
    - .2 Course vegetative material, 10mm diameter and 100mm length, occupying more than 2% of soil volume.
  - .4 Consistence: friable when moist.

### **2.2          Soil Amendments**

- .1 Sand: washed coarse silica sand, medium to course textured.
- .2 Organic matter: compost Category A, unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements.
- .3 Use composts meeting Category B requirements for land fill reclamation and large scale industrial applications.
- .4 Limestone:
  - .1 Ground agricultural limestone.
  - .2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.
- .5 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 Contract Administrator of sources of topsoil and 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 Contract Administrator. Soil sampling, testing and analysis to be in accordance with Provincial standards.

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## **Part 3 Execution**

### **3.1 Stripping of Topsoil**

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

### **3.2 Preparation of Existing Grade**

- .1 Verify that grades are correct. If discrepancies occur, notify Contract Administrator and do not commence work until instructed by Contract Administrator.
- .2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.
- .3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials. Remove soil contaminated with calcium chloride, toxic materials and petroleum products. Remove debris that protrudes more than 75 mm above surface. Dispose of removed material off site.
- .4 Cultivate entire area which is to receive topsoil to minimum depth of 100 mm. Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

### **3.3 Placing and Spreading of Topsoil/ Planting Soil**

- .1 Place topsoil after Contract Administrator has accepted subgrade.
- .2 Spread topsoil in uniform layers not exceeding 150mm.
- .3 For sodded areas keep topsoil 15mm below finished grade.
- .4 Spread topsoil as indicated to following minimum depths after settlement.
  - .1 135mm for sodded areas.
  - .2 300mm for flower beds where shown.
    - .1 Plantings as indicated on Drawings.
- .5 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

**3.4 Finish Grading**

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

**3.5 Acceptance**

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

**3.6 Surplus Material**

- .1 Dispose of materials except topsoil not required off site.

**3.7 Cleaning**

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED SECTIONS**

- .1            Section 01 33 00 - Submittal Procedures.
- .2            Section 32 91 21 - Topsoil Placement and Grading.

**1.2                SUBMITTALS**

- .1            Samples.
  - .1            Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
  - .2            Submit:
    - .1            Sod for each type specified.
      - .1            Install approved samples in one square metre mock-ups and maintain in accordance with maintenance requirements during establishment period.

**1.3                QUALITY ASSURANCE**

- .1            Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .2            Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3            Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements. Obtain clarifications from Contract Administrator if necessary.

**1.4                SCHEDULING**

- .1            Schedule sod laying to coincide with preparation of soil surface.
- .2            Schedule sod installation when frost is not present in ground.

**1.5                WASTE MANAGEMENT AND DISPOSAL**

- .1            Divert unused fertilizer from landfill to official hazardous material collections site approved by Contract Administrator
- .2            Do not dispose of unused fertilizer into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

**Part 2 Products**

**2.1 MATERIALS**

- .1 Number One Turf Grass Nursery Sod: sod that has been especially sown and cultivated in nursery fields as turf grass crop.
  - .1 Turf Grass Nursery Sod types:
    - .1 Number One Kentucky Bluegrass Sod: Nursery Sod grown solely from seed of cultivars of Kentucky Bluegrass, containing not less than 50% Kentucky Bluegrass cultivars.
    - .2 Number One Kentucky Bluegrass Sod - Fescue Sod: Nursery Sod grown solely from seed mixture of cultivars of Kentucky Bluegrass and Chewing Fescue or Creeping Red Fescue, containing not less than 40% Kentucky Bluegrass cultivars and 30% Chewing Fescue or Creeping Red Fescue cultivar[s].
    - .3 Number One Named Cultivars: Nursery Sod grown from certified seed.
  - .2 Turf Grass Nursery Sod quality:
    - .1 Not more than 2 broadleaf weeds or 10 other weeds per 40 square metres.
    - .2 Density of sod sufficient so that no soil is visible from height of 1500 mm when mown to height of 50 mm.
    - .3 Mowing height limit: 35 to 65 mm.
    - .4 Soil portion of sod: 6 to 15 mm in thickness.
  - .3 Mow sod at height directed by Contract Administrator within 36 hours prior to lifting, and remove clippings.
- .2 Water:
  - .1 Supplied by Contract Administrator at designated source.
- .3 Fertilizer:
  - .1 To Canada "Fertilizers Act" and "Fertilizers Regulations".
  - .2 Complete, synthetic, slow release with 65 % of nitrogen content in water-insoluble form.

**2.2 SOURCE QUALITY CONTROL**

- .1 Obtain approval from Contract Administrator of sod at source.
- .2 When proposed source of sod is approved, use no other source without written authorization from Contract Administrator.

**Part 3 Execution**

**3.1 PREPARATION**

- .1 Verify that grades are correct and prepared in accordance with Section 32 91 19.13 - Topsoil Placement and Grading. If discrepancies occur, notify Contract Administrator and do not commence work until authorized to do so.

- .2 Do not perform work under adverse field conditions such as frozen soil, excessively wet soil or soil covered with snow, ice, or standing water.
- .3 Fine grade surface free of humps and hollows to smooth, even grade, to tolerance of [plus or minus 8 mm, for Turf Grass Nursery Sod, surface to drain naturally.
- .4 Remove and dispose of weeds; debris; stones 50mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site. in location as directed by Contract Administrator.

### **3.2 SOD PLACEMENT**

- .1 Lay sod within 24 hours of being lifted if air temperature exceeds 20 degrees C.
- .2 Lay sod sections in rows, joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.
- .3 Roll sod as directed by Contract Administrator. Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.

### **3.3 FERTILIZING PROGRAM**

- .1 Fertilize during establishment and warranty periods to following program:

Date	Date	Rate	Ratio
[ ] to	[ ]	[ ][kg/ha]	[ ]
[ ] to	[ ]	[ ][kg/ha]	[ ]
[ ] to	[ ]	[ ][kg/ha]	[ ]

### **3.4 MAINTENANCE DURING ESTABLISHMENT PERIOD**

- .1 Perform following operations from time of installation until acceptance.
- .2 Water sodded areas in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 75 to 100 mm.
- .3 Cut grass to 50 mm when or prior to it reaching height of 75 mm. Remove clippings which will smother grassed areas as directed by Contract Administrator.
- .4 Maintain sodded areas weed free 95%.
- .5 Fertilize areas in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles and water as per manufacturer's instructions.

### **3.5 ACCEPTANCE**

- .1 Turf Grass Nursery Sod areas will be accepted by Contract Administrator provided that:
  - .1 Sodded areas are properly established.
  - .2 Sod is free of bare and dead spots.

- .3 No surface soil is visible from height of 1500 mm when grass has been cut to height of 50mm.
- .4 Sodded areas have been cut minimum 2 times prior to acceptance.
- .2 Areas sodded in fall will be accepted in following spring one month after start of growing season provided acceptance conditions are fulfilled.

### **3.6 MAINTENANCE DURING WARRANTY PERIOD**

- .1 Perform following operations from time of acceptance until end of warranty period:
  - .1 Water sodded [Turf Grass Nursery Sod] [and] [Commercial Grade Turf Grass Nursery Sod] areas at weekly intervals to obtain optimum soil moisture conditions to depth of 100 mm.
  - .2 Repair and resod dead or bare spots to satisfaction of Contract Administrator.
  - .3 Cut grass and remove clippings that will smother grass to height as follows:
    - .1 Turf Grass Nursery Sod:
      - .1 50 mm during normal growing conditions.
      - .2 Cut grass at intervals so that approximately one third of growth is removed in single cut.
      - .3 Fertilize areas in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles and water as per manufacturer's instructions.
      - .4 Eliminate weeds to extent acceptable Contract Administrator.
        - .1 If chemical means are used, comply with Section [31 31 19.13 - Chemical Control of Vegetation] [\_\_\_\_].

### **3.7 CLEANING**

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**

## **Part 1      General**

### **1.1          SUMMARY**

- .1 Section Includes:
  - .1 Materials and installation for plant material, accessories, mulch, planting, tree support, mulching and maintenance.
- .2 Related Sections:
  - .1 Section 01 33 00 - Submittal Procedures.
  - .2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .3 Section 02 62 00 - Hazardous Materials.
  - .4 Section 31 22 13 - Rough Grading.
  - .5 Section 32 91 21 - Topsoil Placement and Grading.

### **1.2          REFERENCES**

- .1 Agriculture and Agri-Food Canada (AAFC).
  - .1 Plant Hardiness Zones in Canada-[2000].
- .2 Canadian Nursery Landscape Association (CNLA).
  - .1 Canadian Standards for Nursery Stock-[2001].
- .3 Department of Justice Canada (Jus).
  - .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
  - .2 Transportation of Dangerous Goods Act (TDGA), 1992, c.34.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
  - .1 Material Safety Data Sheets (MSDS).

### **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          SUBMITTALS**

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit product data for:
  - .1 Fertilizer.
  - .2 Mycorrhiza.
  - .3 Anti-desiccant.
  - .4 Guying assembly including clamps, collar, guying wire, anchors and wire tightener.



- .5 Mulch.
- .3 Submit WHMIS MSDS - in accordance with Section 02 62 00.01 - Hazardous Materials.

## **1.5 QUALITY ASSURANCE**

- .1 Health and Safety:
  - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

## **1.6 STORAGE AND PROTECTION**

- .1 Protect plant material from frost, excessive heat, wind and sun during delivery.
- .2 Immediately install plant materials upon delivery to site. Store, protect, and water (as required) that plant material which will not be installed immediately upon arrival at site in storage location approved by Contract Administrator.
- .3 Protect plant material from damage during transportation:
  - .1 When delivery distance is less than 30 km and vehicle travels at speeds under 80 km/h, tie tarpaulins around plants or over vehicle box.
  - .2 When delivery distance exceeds 30 km or vehicle travels at speeds over 80 km/h, use enclosed vehicle where practical.
  - .3 Protect foliage and root balls using anti-desiccants and tarpaulins, where use of enclosed vehicle is impractical due to size and weight of plant material.
- .4 Protect stored plant material from frost, wind and sun and as follows:
  - .1 For bare root plant material, preserve moisture around roots by heeling-in or burying roots in topsoil and watering to full depth of root zone.
  - .2 For pots and containers, maintain moisture level in containers.
  - .3 For balled and burlapped and wire basket root balls, place to protect branches from damage. Maintain moisture level in root zones.
- .5 Store and manage hazardous materials in accordance with Section [01 47 15 - Sustainable Requirements: Construction.
- .6 Waste Management and Disposal:
  - .1 Separate waste materials for recycling in accordance with Section 01 74 19- 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, plastic, polystyrene, corrugated cardboard packaging materials for recycling in accordance with Waste Management Plan (WMP).
  - .4 Separate for recycling: Steel Metal Plastic waste in accordance with WMP.
  - .5 Place materials defined as hazardous or toxic in designated containers.
  - .6 Handle and dispose of hazardous materials in accordance with Municipal regulations.

- .7 Divert unused metal materials from landfill to metal recycling facility as approved by Contract Administrator.
- .8 Fold up metal and plastic banding, flatten and place in designated area for recycling.
- .9 Divert discarded plastic plant containers materials from landfill to plastic recycling facility approved by Contract Administrator.
- .10 Dispose of unused fertilizer at official hazardous material collection site approved by Contract Administrator.
- .11 Dispose of unused anti-desiccant at official hazardous material collections site approved by Contract Administrator.
- .12 Divert unused wood and mulch materials from landfill to recycling or composting facility approved by Contract Administrator.

## **1.7 SCHEDULING**

- .1 Obtain approval from Contract Administrator of schedule 7 days in advance of shipment of plant material.
- .2 Schedule to include:
  - .1 Quantity and type of plant material.
  - .2 Shipping dates.
  - .3 Arrival dates on site.
  - .4 Planting Dates.

## **1.8 WARRANTY**

- .1 The Contractor hereby warrants that plant material as itemized on plant list will remain free of defects for 1 full growing season, providing adequate maintenance has been provided.
- .2 End-of-warranty inspection will be conducted by Contract Administrator.
- .3 Contract Administrator reserves the right to extend Contractor's warranty responsibilities for an additional one year if, at end of initial warranty period, leaf development and growth is not sufficient to ensure future survival.

## **Part 2 Products**

### **2.1 PLANT MATERIAL**

- .1 Type of root preparation, sizing, grading and quality: comply to Canadian Standards for Nursery Stock.
  - .1 Source of plant material: grown in Zone 2b in accordance with Plant Hardiness Zones in Canada.
  - .2 Plant material must be planted in zone indicated as appropriate for its species.
  - .3 Plant material in location appropriate for its species.

- .2 Plant material: free of disease, insects, defects or injuries and structurally sound with strong fibrous root system.
- .3 Trees: with straight trunks, well and characteristically branched for species except where specified otherwise.
- .4 Bare root stock: nursery grown, in dormant stage, not balled and burlapped or container grown.
- .5 Collected stock: maximum 40 mm in caliper, with well developed crowns and characteristically branched; no more than 40% of overall height may be free of branches.

## **2.2 WATER**

- .1 Free of impurities that would inhibit plant growth.

## **2.3 STAKES**

- .1 T-bar, steel, 40 x 40 x 5 x 2440 mm

## **2.4 WIRE TIGHTENER**

- .1 Type 1: galvanized,.
- .2 Type 2: turnbuckle, galvanized 9.5 mm diameter with 270 mm open length.

## **2.5 GUYING WIRE**

- .1 Type 1: steel, 3mm wire.
- .2 Type 3: 3 mm diameter multi-wire steel cable.

## **2.6 CLAMPS**

- .1 U-bolt: galvanized, 13mm diameter, c/w curved retaining bar and hex nuts.
- .2 Crimp type.

## **2.7 ANCHORS**

- .1 Drive-in type.
  - .1 Type 1: 13 mm diameter x 75 mm long, aluminum.

## **2.8 GUYING COLLAR**

- .1 Tube: plastic, 13 mm diameter, nylon reinforced.

## **2.9 TRUNK PROTECTION**

- .1 Plastic: perforated spiralled strip.
- .2 Burlap: clean, minimum 2.5 kg/m<sup>2</sup> mass and 150 mm wide, and twine fastener.

- .3 Tar impregnated crepe paper and twine fastener.

**2.10 MULCH**

- .1 Wood chip: varying in size from 50 mm to 75 mm and 5 to 20 mm thick, free of small branches, leaves and foreign matter.
- .2 Shredded wood: varying in size from 25 to 125 mm in length, from coniferous trees, free of small branches, leaves and foreign matter.

**2.11 FERTILIZER**

- .1 Synthetic commercial type as appropriate per plant type
- .2 Mycorrhiza in contact with new root growth as recommended by manufacturer.

**2.12 ANTI-DESICCANT**

- .1 Wax-like emulsion.

**2.13 FLAGGING TAPE**

- .1 Fluorescent, colour.

**2.14 SOURCE QUALITY CONTROL**

- .1 Obtain approval from Contract Administrator of plant material prior to planting.
- .2 Imported plant material must be accompanied with necessary permits and import licenses. Conform to Federal, Provincial or Territorial regulations.

**Part 3 Execution**

**3.1 PRE-PLANTING PREPARATION**

- .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .2 Ensure plant material acceptable to Contract Administrator.
- .3 Remove damaged roots and branches from plant material.
- .4 Apply anti-desiccant to conifers and deciduous trees in leaf in accordance with manufacturer's instructions.

**3.2 EXCAVATION AND PREPARATION OF PLANTING BEDS**

- .1 Establishment of sub-grade for planting beds is specified in Section 31 22 13 - Rough Grading.

- .2 Preparation of planting beds is specified in Section 32 91 19.13 - Topsoil Placement and Grading]
- .3 For individual planting holes:
  - .1 Excavate to depth and width as indicated.
  - .2 Remove subsoil, rocks, roots, debris and toxic material from excavated material that will be used as planting soil for trees and individual shrubs. Dispose of excess material.
  - .3 Scarify sides of planting hole.
  - .4 Remove water which enters excavations prior to planting. Notify Contract Administrator if water source is ground water.

### **3.3 PLANTING**

- .1 For bare root stock, place 50 mm backfill soil in bottom of hole. Plant trees and shrubs with roots placed straight out in hole.
- .2 For jute burlapped root balls, cut away top one third of wrapping and wire basket without damaging root ball. Do not pull burlap or rope from under root ball.
- .3 For container stock or root balls in non-degradable wrapping, remove entire container or wrapping without damaging root ball.
- .4 Plant vertically in locations as indicated. Orient plant material to give best appearance in relation to structure, roads and walks.
- .5 For trees and shrubs:
  - .1 Backfill soil in 150 mm lifts. Tamp each lift to eliminate air pockets. When two thirds of depth of planting pit has been backfilled, fill remaining space with water. After water has penetrated into soil, backfill to finish grade.
  - .2 Form watering saucer as indicated.
- .6 For ground covers, backfill soil evenly to finish grade and tamp to eliminate air pockets.
- .7 Water plant material thoroughly.
- .8 After soil settlement has occurred, fill with soil to finish grade.
- .9 Dispose of burlap, wire and container material off site.

### **3.4 TRUNK PROTECTION**

- .1 Install trunk protection on deciduous trees as indicated.
- .2 Install trunk protection prior to installation of tree supports when used.

### **3.5 TREE SUPPORTS**

- .1 Install tree supports as indicated.

- .2 Use single stake tree support for deciduous trees less than 3 m.
  - .1 Place stake on prevailing wind side and 150 mm from trunk.
  - .2 Drive stake minimum 150 mm into undisturbed soil beneath roots. Ensure stake is secure and vertical.
  - .3 Install 150 mm long guying collar 1500 mm above grade.
  - .4 Thread Type 1 guying wire through guying collar tube. Twist wire to form collar and secure firmly to stake. Cut off excess wire.
  - .5 Install flagging tape to guys as indicated.
- .3 After tree supports have been installed, remove broken branches with clean, sharp tools.

### **3.6 MULCHING**

- .1 Ensure soil settlement has been corrected prior to mulching.
- .2 Spread mulch as indicated.

### **3.7 MAINTENANCE DURING ESTABLISHMENT PERIOD**

- .1 Perform following maintenance operations from time of planting to acceptance by Contract Administrator.
  - .1 Water to maintain soil moisture conditions for optimum establishment, growth and health of plant material without causing erosion.
    - .1 Remove weeds monthly.
    - .2 Replace or respread damaged, missing or disturbed mulch.
    - .3 For non-mulched areas, cultivate as required to keep top layer of soil friable.
    - .4 If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from Contract Administrator prior to application.
    - .5 Remove dead or broken branches from plant material.
    - .6 Keep trunk protection and guy wires in proper repair and adjustment.
    - .7 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.

### **3.8 MAINTENANCE DURING WARRANTY PERIOD**

- .1 From time of acceptance by Contract Administrator 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 Reform damaged watering saucers.
  - .3 Remove weeds monthly.
  - .4 Replace or respread damaged, missing or disturbed mulch.

- .5 For non-mulched areas, cultivate monthly to keep top layer of soil friable.
- .6 If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from [Contract Administrator prior to application.
- .7 Apply fertilizer in early spring as indicated by soil test.
- .8 Remove dead, broken or hazardous branches from plant material.
- .9 Keep trunk protection and tree supports in proper repair and adjustment.
- .10 Remove trunk protection, tree supports and level watering saucers at end of warranty period.
- .11 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.
- .12 Submit monthly written reports to Contract Administrator 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.

**END OF SECTION**