

LANDSCAPE STANDARD

1983

Prepared jointly by:

The B. C. Society of Landscape Architects

The B. C. Nursery Trades Association

DRAFT

OCTOBER 17, 1983

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SUBJECT TO CHANGE

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To all holders of the Landscape Standard:

The postcard included on this sheet is intended to provide the Standard Committee with a complete list of holders, so that we may advise all holders of amendments, supplements and new sections of the Landscape Standard.

Please fill in and return to the Committee.

Name _____

Date of receipt of
Landscape Standard

Position _____

Agency or Firm _____

Address _____

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(Note: The numbers in parentheses are the section numbers of the Construction Specifications Association of Canada National Master Specification, included here for cross reference for projects specified in that format).

PREFACE

The 1983 edition is the first edition of the Landscape Standard. It has been prepared by a joint committee of the B. C. Society of Landscape Architects and the B. C. Nursery Trades Association. The Committee is composed of:

_____ Chairman
_____ Subcommittees

The Committee wishes to thank contributors to the Standard, including . . .

The purpose of this Standard is to document what has been agreed by both B. C. N. T. A. and B. C. S. L. A. to be an acceptable level of landscape construction, and to set guidelines that will upgrade landscape work being carried out. It is hoped that Federal, Provincial and Municipal agencies will adopt the Standard and will require inspections of all work to ensure compliance with the provisions of the Standard. In addition, it is intended that landscape architects, Parks Boards, and other specifiers of landscape work will simplify and standardize their specifications by making reference to the Standard.

Of particular importance is the factor that broad acceptance of the Standard and more uniform enforcement of acceptable levels of performance will result in landscape contractors being able to provide in their bidding for quality work with assurance that their competition is bidding on the same basis.

Comments, criticisms, and suggestions for the improvement of the Landscape Standard are welcomed, and should be addressed to:

October, 1983

ENDORSEMENTS

The Landscape Standard is endorsed by:

REFERENCE PUBLICATIONS

This Standard refers to the following publications, and where such reference is made shall be to the latest edition and any amendments thereto approved by the organization issuing that publication.

1. Standards

- CNTA, Guide Specification for Nursery Stock.
- CMHC, Roof Decks, Design Guidelines, Publication NHA 5520 79-01.
- CSA B181.12 - 1967, Recommended Practice for the Installation of PVC Drain, Waste and Vent Pipe and Pipe Fittings.
- CSA B181.4 - 1976, Polyethylene (PE) Drain, Waste and Vent Pipe and Pipe Fittings.
- CSA B181.1 - M1977, Plastic Drain and Sewer Pipe and Pipe Fittings.
- CSA B182.11 - 1967, Recommended Practice for the Installation of Plastic Drain and Sewer Pipe and Pipe Fittings.
- CSA A60.1 - M1976, Vitrified Clay Pipe.
- CSA A60.3 - M1976, Vitrified Clay Pipe Joints.
- Ontario Shade Tree Council, Arboriculture Specifications.
- , Nursery Sod Specifications, Nursery Sod Growers' Association.
- Public Works Canada - 1980, Canadian National Master Construction Specification, Dept. of Public Works, Ottawa.
- Public Works Canada, Landscape and Site Development, Design Branch, Dept. of Public works, Ottawa.
- Agriculture Canada - 1978, The Canadian System of Soil Classification, Publication #1646, Canada Dept. of Agriculture, Ottawa.

2. Provincial Legislation

- The Mechanics Lien Act
- The Cemeteries Act
- The Dogwood, Rhododendron and Trillium Act
- The Environment and Land Use Act
- The Employment Standards Act
- The Grasshopper Control Act
- The Greenbelt Act
- The Highway Act
- The Highway Scenic Improvement Act

- The Labour Code
- The Land Titles Act
- The Park Act
- The Pesticide Control Act
- The Plant Protection Act
- The Pollution Control Act
- The Recreational Land Act
- The Riverbank Protection Act
- The Water Act
- The Weed Control Act
- The Wildlife Act
- The Worker's Compensation Act

3. Federal Legislation

- The Environmental Contaminants Act
- The Fisheries Act
- The Food and Drug Act
- The Plant Quarantine Act
- Migratory Bird Regulations
- The Seed and Fertilizer Act

4. Sources of Additional Information

- Gaines, Richard L., Interior Landscaping, New York: Architectural Record Books, 1977.
- Pacific Soil Analysis, Inc., Report prepared for Don Vaughan & Associates re: Soils for Landscaping Purposes, 1980.
- McKeague, J. A., Manual on Soil Sampling and Methods of Analysis, published by either Agriculture Canada or the Canadian Society of Soil Science.
- Black, C. A., Methods of Soil Analysis, used by Soil Science Society of America.
- Lavkulich, L. M. and Hermon, Bev, Methods Manual, Soil Science Dept., University of British Columbia.
- _____, A Guide to Specifications for Interior Landscaping, Associated Landscape Contractors of America, 1979.
- Alex, J. F. and Switzer, C. M., Weed Control in Lawns, Ontario Ministry of Agriculture and Food, Publication 529, 1973.
- Cordukes, W. E., Lawns, Agriculture Canada, Publication 1163, Revised 1975.
- Webber, L. R. (ed.), Ontario Soils - Physical, Chemical and Biological Properties and Soil Management Practices, Ontario Ministry of Agriculture and Food, Publication 492.

- Brady, Nyle C., The Nature and Properties of Soils, 8th Edition, New York: Macmillan Publishing Co. Inc., 1974.
- 1982 Publications List, B. C. Ministry of Agriculture and Food.
- Nursery Production Guide 1982, B. C. Ministry of Agriculture and Food.
- Major Insect and Mite Pests of Ornamental Shrubs and Shade Trees of B. C., B. C. Ministry of Agriculture and Food.
- Pruning Nursery Stock, B. R. Greenwell, Nursery Horticulturist, Dec. 1979, B. C. Ministry of Agriculture and Food.
- Nursery Stock Production in B. C. B - Field Culture, B. R. Greenwell, Nursery Horticulturist, Jan. 1980, B. C. Ministry of Agriculture and Food.
- Nursery Stock Production in B. C. A - Container Culture, B. R. Greenwell, Nursery Horticulturist, May 1982, B. C. Ministry of Agriculture and Food.
- Robinette, Gary O. 1968. Off the Board/Into the Ground. Dubuque, Iowa: Kendall/Hunt Publishing Co.
- Waddle, A. E. Landscape Techniques. London: Heinemann.
- , Common Pest of Ornamental Trees and Shrubs, Ontario Ministry of Natural Resources, Publication PC.3, 1975.
- 4428: 1969 (1979), Recommendations for General Landscape Operations (excluding hard surfaces), SBN 580 05057 2.
- 3975: 1969, Glossary for Landscape Work.
- CMHC: Site Planning Criteria (under republication)
Roof Decks Design Guidelines (NHA 5220 79/11)
- Environment Canada Forestry Service: Forest Landscape Development Handbook (visual).
- Department of Fisheries and Oceans: Guidelines for Land Development and Protection of the Aquatic Environment (No. 807, 1978).
- Public Works Canada: Landscape Site Development (No. W31-2372).
Landscape Construction Details (No. 78-01).
- Transport Canada: Airport Grounds Development and Maintenance (No. AK 70-11).

INTRODUCTION

Standards and Specifications

This document is not a specification. The Webster dictionary defines a specification in part as a ". . . detailed, precise statement of legal particulars . . ." related to a particular item, and defines a standard in part as ". . . constituting or conforming to a standard established by custom or law . . . widely recognized as acceptable . . .".

This Standard

The Standard has adopted existing trade standards wherever possible and has, in addition, documented existing successful practices. It should therefore become a widely accepted reference for normal, acceptable performance.

Applicable federal and provincial legislation is adopted by frequent reference to help ensure that all landscape work is carried out in compliance with applicable legislation.

As with many published standards, the Landscape Standard results from the effort of a group manufacturers, producers, professionals and tradesmen seeking simplification and efficiency or the assurance of a minimum level of quality.

The Landscape Standard has two basic objectives:

- (1) to establish levels of quality that may be recognized by the user, specifier, approver or buyer of a material, product, plant, design, system, or installation procedure; and
- (2) to standardize or simplify such variables as dimensions, varieties or other characteristics of specific products or plants so as to minimize the variation in manufacture, production and/or use.

Living Material

In contrast with most construction and products standards, the Landscape Standard deals largely with living materials. This is important in two respects.

First, many of the "products" are not manufactured, rather they are found in nature or are produced by the management of natural processes. These products are therefore more widely varied and not as easily quantified as manufactured products. The Standard strives to standardize as far as possible definitions of products and acceptable, recognizable levels of quality.

Secondly, and more importantly, handling of these living materials must be done with a full understanding of their vital nature. Mishandling can destroy the structure of a soil that has been built up over centuries of natural processes; a lapse in providing for the needs of plant material can cause irreparable damage. Recognition of these factors is integral to this Standard.

A Living Document

The Landscape Standard is designed to be capable of change and expansion. It will be reviewed regularly every three years in the light of changes in trade practices, new techniques, and user comments. Amendments, supplements and new sections will be published accordingly, to keep the Standard current and effective.

Possible additional Standard Sections include:

- Landscape irrigation
- Valuation of existing plants
- Long-term maintenance
- Fire lanes

A GUIDE TO THE USE OF THIS STANDARD

Administration Recommendations

The Landscape Standard does not attempt to distribute responsibility for enforcement of its provisions or to predetermine methods of use by specifiers, municipalities or other users. The Standard can be readily adopted by various users by the selection, adoption and, if necessary, by modification of the Administration Recommendations. Determining the suitability of the Standard for each user's purposes remains the responsibility of that user.

A written standard cannot cover the requirements of all projects. This Standard, therefore, is intended to set a level of quality which is to be equalled or bettered in the construction documents for each project. Where provisions of the construction documents conflict with this Standard, but set a level of quality compatible with this Standard, the construction documents shall govern the work.

Format

The layout and language of this Standard is based on guidelines from the Canadian Standards Association for compatibility with widely recognized published standards.

For ease of cross-referencing by construction specifiers, individual topics are in the universal three-part format: General (including a listing of pertinent legislation and standards), Products, Execution. The section numbering system of the National Master Specification is referenced in the Table of Contents and in each topic heading.

1. GENERAL

1.1 ADMINISTRATION RECOMMENDATIONS

1.1.1 Use by Authorities

It is recommended that the provisions of the Landscape Standard be formally adopted by municipalities and other agencies having an interest in maintaining a standard of quality for landscape work. The following procedures are recommended for municipalities and other Authorities for administration and enforcement of the Standard.

1.1.2 Working Documents

The Authority should require that a copy of the Working Documents be submitted to the Authority before the work begins. This should be coordinated with the development permit/building permit/approval process for each Authority.

1.1.3 Changes

- (1) The Authority should require that all substantial changes in design, materials, or existing conditions from those shown in the Working Documents be reported in writing to the Authority. The Working Documents should be revised to show all changes. All substantial changes should be approved in writing by the Authority before the changes are carried out on site.

1.1.4 Inspections

- (1) The Authority should identify a qualified Inspector before the work is to begin.
- (2) The contract between Owner and Contractor should set out who is responsible for testing and certification of products and materials, and in particular the growing medium.
- (3) Unless the contract sets out other provisions, the Owner shall pay for testing and obtaining all certifications of compliance with this Standard, except that if any product or material does not meet the Standard, the cost of all subsequent retesting shall be borne by the Contractor.
- (4) The Inspector should take actions as necessary to ensure compliance with this Standard and with working documents and approved changes, including, but not limited to:

- (i) - inspecting the work as often as necessary
(ii) - calling for samples and tests of materials and products as necessary

who pays

- (iii) - interpreting test results
 - (iv) - reporting to the Authority (see Definitions, 1.3) on the results of tests and inspections
 - (v) - advising the Contractor, the Authority and the Owner of any work found unacceptable
- (5) The Inspector shall have access to the work at all reasonable times for the above purposes.
- (6) The Inspector shall not interfere with the Contractor's control and management of the work and his forces, except to prevent non-compliance with this Standard.
- (7) Inspections and reports shall be timed to avoid undue delays in the execution of the work.
- (8) A minimum of four inspections are recommended as per the following schedule:
- (i) Existing Conditions Review
 - confirm site conditions, proposed layout, and approved substitutions or contract changes to date, prior to construction
 - (ii) Subgrade/Growing Medium Inspection
 - (iii) Inspection for Acceptance
 - (iv) Guarantee Inspection
 - confirm completion of all necessary replacements and corrections at the conclusion of the guarantee period

1.1.5 Acceptance

In most cases, the work will be inspected by the Owner's representative, likely the landscape architect, to determine compliance with the contract for the work, and to set Substantial Completion (Mech. Lien Act) and to accept the work on the Owner's behalf.

It is anticipated that in the above case, as well as when there is no separate professional inspector, the Inspector appointed by the Authority will inspect to ensure compliance with this Standard, and will determine Acceptance independently in accordance with this Standard and with the Authority's procedures.

Acceptance of landscape work by an Authority should be integrated with the development permit/building permit/approval process.

1.1.6 Bonding / Administration of Guaranty

It is recommended that the Authority require a bond for each project to ensure that the work is done to this Standard, and as shown in the working documents, and that maintenance is carried out at least to this Standard.

NOTE: EACH AUTHORITY SHOULD SET A LOWER LIMIT ON THE VALUE OF WORK TO WHICH BONDING REQUIREMENTS APPLY, TO AVOID ADMINISTRATIVE LOADS ON SMALL SCALE PROJECTS.

The Authority should ensure that the work is maintained during the guaranty period by conducting an inspection near the end of the guaranty period and exacting a penalty, such as forfeiture of a bond if maintenance and guaranty requirements have not been met.

In order that the Contractor's one-year guaranty be valid, the Owner must arrange to have the provisions of Section 11 - ESTABLISHMENT MAINTENANCE carried out during the guaranty period by competent gardeners.

Maintenance may be carried out by persons other than the Contractor who originally did the work, as long as all the provisions of Section 11 are met.

Regardless of who does the maintenance, that party should be required to maintain a log book stating when maintenance work is carried out, what operations are carried out, and noting any site conditions requiring attention. In addition, maintenance personnel should report the above information to the Owner's representative each time they are on site.

1.1.7 Reports

The Authority should have a mechanism set up for receiving reports of changes, discrepancies found in the course of the work, and reports of damage as required by this Standard. The Contractor should be advised of procedures for reporting before the work begins.

Reports of changes, etc. shall be made promptly and in such a manner that the work schedule and administration procedures are not unduly hampered.

1.1.8 Insurance

Recommended minimum insurance requirements are included in this Standard, however the Authority and the Owner and other parties involved may wish to add to these requirements, and should ensure that proof of insurance is provided, if necessary (see Insurance - Section 2.16).

1.1.9 Use by the Owner

This Standard makes no provisions for contractual arrangements between Owners, Contractors, and Consultants. The Standard can, however, be used as a guide to the various responsibilities involved in ensuring quality landscape work, and to pertinent legislation.

Any contract between the Owner and Contractor should provide for performance equal to or better than that set out in this Standard, and should clearly document who is responsible for compliance with each provision of this Standard.

An Inspector appointed by a municipality or other Authority will be acting in the interest of the Authority, not that of the Owner. It is recommended that a landscape architect be appointed to administer the contract in the interest of the Owner.

Recommended procedures by the Owner or Owner's representative include:

- (1) provision of Working Documents to Contractor
- (2) resolving and documenting changes in the work
- (3) inspections and reports
- (4) administration of the contract and in regard to such legislation as the Mechanics' Lien Act
- (5) testing
- (6) documentation of a guaranty/maintenance agreement between Owner and Contractor (recommended but not mandatory in this Standard)

In adopting the Landscape Standard for a given Contract, an Owner and his representative should review the following provisions and include them as part of their contract with the Contractor:

- (1) Inspection/testing of topsoil/growing medium
 - fertilizer requirements
- (2) Approval procedures for plant material at nursery and/or on site
- (3) Guaranty
- (4) Approval of planting layout
- (5) Acceptance
- (6) Partial acceptance
- (7) Terms of takeover
- (8) Maintenance requirements

1.2 SCOPE

1.2.1 This Standard applies to work that is conventionally thought of as "landscaping"; that is, work generally described by the following headings:

- (a) Site Preparation
- (b) Grading
- (c) Drainage

- (d) Growing Medium
- (e) Additives to Growing Medium (Including Fertilizer)
- (f) Seeding
- (g) Sodding
- (h) Hydroseeding
- (i) Planting
- (j) Landscaping Over Structures
- (k) Establishment Maintenance

1.2.2 This Standard applies also to the areas of planning, design and administration that affect the above headings.

1.3 DEFINITIONS

In this Standard:

Acceptance means - notification to the Contractor or the Owner by the Authority that the work is complete and that the requirements of the Standard have been met in regard to the Work, to the satisfaction of the Authority.

Administration means - the adoption, interpretation and enforcement by the Authority of this Standard, and procedures undertaken by the Authority regarding this Standard. Administration shall also include procedures by the Contractor as required by the Authority regarding this Standard (e.g., reporting, calling for inspections).

Authority means - any body, government, agency, corporation, or individual that adopts this Standard in regard to the Work (may include the Owner or his agents).

Bareroot means - that the plant referred to has been properly dug in the dormant season and prepared for transplanting with no soil on the roots.

Container Grown means - that the plant referred to has been grown in standard nursery containers appropriate to its age and size, and not field-grown or collected.

Contractor means - the landscape contractor carrying out the Work (and may also include, if applicable, the Owner, its agents, or government departments carrying out the Work).

Drip Line means - the line on the ground directly below the outermost twigs of a tree, representing approximately the horizontal extent of the root system.

Field Capacity means - moisture retained against gravity after soil drainage in a well-drained soil.

Growing Medium means - material selected or prepared, to the requirements of this Standard, for planting and growing plants. Growing Medium includes:

- (1) imported topsoil that has been prepared to the requirements of this Standard

- (2) existing topsoil that has been stockpiled and prepared to the requirements of this Standard
- (3) mixtures of Growing Medium Components that meet the requirements of this Standard.

Loam means - loam as defined by the Canadian System of Soil Classification.

Permanent Wilting Point means - the point where the soil moisture retained is unavailable to the plant, causing it to wilt and not regain turgidity at night.

Required means - required by this Standard or by other standards, codes, laws, or regulations in force or referenced by this Standard.

Saturation Point means - all soil pores full of water.

Shall means - that the sentence is a mandatory requirement of this Standard.

Should means - that the sentence is a recommendation. (Such recommendations may be adopted as mandatory by the Authority or by a specifier before the work begins.)

Specimen means - a plant, usually a large shrub or tree, exhibiting either all the best qualities of its type or displaying a unique desirable character or form.

The Work means - (1) all landscape work in British Columbia, and
(2) in regard to administration and enforcement by an Authority that has legally adopted this Standard, means the particular project or portion of a project to which the Standard is being applied.

Topsoil means - imported or on-site soil which meets, or can be modified to meet, the requirements of this Standard.

2. GENERAL REQUIREMENTS

2.1 PLANNING/DESIGN

- 2.1.1 The planning, design and documentation of landscape work shall be such that all bylaws, applicable codes, regulations and standards, including this Standard, can be met during construction and upon completion of the Work.
- 2.1.2 The Owner shall be responsible for ensuring that the provisions of 2.1.1 are met, and shall ensure that its consultants, agents and contractors for the Work comply with all bylaws, codes, etc.
- 2.1.3 Professional consultants having expertise appropriate to the needs of each project shall be engaged in the planning and design of the landscape work.

Professional consultants who might be engaged include (but are not limited to) landscape architects, professional horticulturists, urban foresters, arborists, and agronomists.

2.2 WORKING DOCUMENTS

- 2.2.1 Existing conditions and new work shall be adequately and accurately described in a set of working documents to be provided to the Contractor and to the Authority. (See Administration Recommendations, 1.1.)
- 2.2.2 Working documents shall show, at least:
 - (a) existing grades (where appropriate)
 - (b) new grades (where appropriate)
 - (c) locations of existing plants or vegetation areas to be protected
 - (d) locations of existing plants or vegetation to be removed
 - (e) locations of existing features and utilities
 - (f) depths of growing medium
 - (g) locations, species, sizes, quantities of new plant material
 - (h) landscape specification

2.3 SITE EXAMINATION

No landscaping work shall be carried out in areas or over surfaces that are not properly prepared. The Contractor shall examine the site before starting work to verify that all surfaces are properly prepared. See Administration Recommendations for reporting improperly prepared surfaces.

2.4 SUPERVISION

- 2.4.1 The Contractor shall ensure competent supervision for the duration of the work on site.

2.4.2 The person designated responsible for supervision shall ensure that the required standards of work, materials and safety are achieved. This includes, but is not limited to, confirmation of safety codes and utility layout, records of changes, and on-site coordination, scheduling and management.

2.5 SCHEDULING

2.5.1 The Contractor shall schedule all operations to ensure optimum environmental protection, grading, growing medium placement, planting, seeding or sodding operations as outlined in these Standards. Scheduling shall be organized to ensure a minimum duration of on-site storage of plant material, minimum movement and compaction of growing medium, and prompt mulching and watering operations. The work schedule shall be coordinated with scheduling of other trades on site.

2.5.2 Coordination and scheduling shall be such that no damage occurs to materials before or after installation. In particular, the requirements of living plant material shall be met.

2.6 WORKMANSHIP

The Contractor shall employ *skilled or* experienced personnel for the landscape work, and shall enforce good discipline and order on the site. Recommended personnel should have successful completion of apprenticeship or recognized horticultural diploma courses, or hold current B.C.N.T.A. certification.

2.7 CHANGES

All substantial changes in design, materials or existing conditions shall be reported and shall be resolved in a manner not detrimental to the quality of the design or the work. See Administration Recommendations, 1.1.

2.8 TESTING AND CERTIFICATION

2.8.1 All products and materials used in the work shall be subject to testing when the Inspector determines that testing is necessary to ensure that they meet this Standard. This includes, but is not limited to, seed and seed mixes, fertilizers, mulches, growing medium and its components.

2.8.2 Testing shall be carried out by an independent testing laboratory, using commonly accepted testing methods, or methods set out in this Standard. *as set in 1.1.3 part iii*

What Lab?

if you have parent material what happens?

soil provided

2.8.3 The testing laboratory shall make the test result available to the Contractor, the Inspector and the Owner and shall include either: (a) certification that the tested samples meet the requirements of this Standard, or (b) recommendations for modifying the material or product to meet the Standard.

2.8.4 The Contractor shall carry out the recommended modifications and shall submit new samples for testing if required by the Inspector.

2.8.5 The Contractor shall only be required to modify products or materials as necessary to meet this Standard, except if his contract with the Owner requires a different product or material of equal or better quality.

2.8.6 Samples:

2.8.6.1 Samples of all materials shall be taken, handled and shipped in such a manner that they are representative of the material or product sampled, and shall meet the following requirements:

lab?
 lab?
 (a) Commercial fertilizers: Properly labelled bags shall constitute assurance of conformity. Labels shall be accessible to the Inspector on the job, and inventory taken at each delivery. (Where large installations are involved, it may be advisable to request the Bureau of Chemistry, ~~Department of Agriculture~~, to check the validity of the label. This can be done at no cost to the Owner or Contractor, and places full responsibility upon the supplier.) A minimum 2 kg sample of each material shall be supplied to the control laboratory. *Canada Ag*

lab?
 (b) Seeds and seed mixtures: Certification by the seed supplier shall constitute assurance of conformity, except when the Inspector has reason to verify such certification. A minimum 500 g sample of each seed type or mix shall be supplied to the laboratory. *analysis*

(c) Sand, rock, gravel and other aggregates: When required, a 1 litre sample of each material shall be supplied to the ~~the~~ *a commercial* laboratory.

(d) Soil and growing medium: Subsamples shall be taken at the rate of one subsample per 1,000 m² before stripping on-site soil, or one subsample per 200 m³ for stockpiled on-site soil or for growing medium, to a minimum 5 subsamples and maximum 10 subsamples.

Subsamples shall be taken using a 25 mm sampling tube or a spade. Subsamples shall be thoroughly mixed to obtain a representative composite sample. At least 1 litre of this final sample shall be supplied to the testing laboratory.

- (e) Organic growing medium components: When required, samples of peat moss, manure and other proposed organic amendments shall be supplied to the testing laboratory, in the form of a 1 litre sample of each material.
- 2.8.6.2 Samples in the quantities and conditions set out in this Standard shall be provided to the Inspector for testing within 48 hours of his request for samples (or within an agreed reasonable time if conditions do not permit this).
- 2.8.6.3 Testing shall be carried out as quickly as possible when the Contractor's operations may be delayed by waiting for certification.
- 2.8.6.4 The Inspector may, at his discretion, waive the requirement of testing for each particular project. (This may apply when the Contractor or his supplier has sampled a stock of material, a portion of which will be used in the work, or when the Inspector is familiar with the product from the intended source.)

2.9 INSPECTIONS, ACCEPTANCE

- 2.9.1 Inspection procedures are recommended in Administration Recommendations, 1.1.
- 2.9.2 The Inspector shall have access to the work at all reasonable times for ensuring compliance with the Standard.
- 2.9.3 The Inspector shall not interfere with the Contractor's control and management of the work and his forces, except to examine for or to prevent non-compliance with this Standard.
- 2.9.4 Inspections and reports shall be timed to avoid undue delays in the execution of the work. The Contractor shall give reasonable notice when the work will be ready for inspections in order to avoid delays.
- 2.9.5 Conditions for Acceptance of work are shown in the General part of each section. Acceptance and turnover procedures are recommended in Administration Recommendations, 1.1.

2.10 GUARANTY/MAINTENANCE

- 2.10.1 The Contractor shall guarantee all materials and workmanship for a period of one (1) full year from the date of Final Acceptance, unless specified otherwise.

NOTE: GUARANTY PERIODS GREATER THAN ONE YEAR FOR SPECIFIC WORKS, NOTABLY LARGE TREES, SHOULD BE REQUIRED IN THE WORKING DOCUMENTS.

- 2.10.2 This guaranty includes replacing all plants that are determined by the Inspector to be dead or failing at the end of the guaranty period. Plant replacements shall be made at the next appropriate season, and the conditions of the guaranty shall apply to all replacement plants for one full growing season.
- 2.10.3 The guaranty shall not apply to plants or other products damaged after Acceptance by causes beyond the Contractor's control, such as vandalism, "acts of God", "excessive wear and tear", or abuse. (The Contractor is considered responsible for the work until Acceptance.)
- 2.10.4 The guaranty shall not be valid unless it can be proven that the requirements of Section 11 - ESTABLISHMENT MAINTENANCE have been carried out to a degree acceptable to the Inspector.
- 2.10.5 Guarantee on Nursery Stock *to be written*

2.11 PROTECTION

2.11.1 Environmental Protection

- 2.11.1.1 Environmental damage shall be avoided by ensuring that construction operations are carefully planned and scheduled. Areas that are sensitive or present potential problems shall be noted and schedules and work methods shall be prepared accordingly.
- 2.11.1.2 *Soil* Stripping operations shall be carried out in such a manner as to avoid silting and sedimentation in any stream or other water body. Retention ponds and dikes shall be installed where necessary to prevent rapid site runoff into water courses.
- 2.11.1.3 Stockpiled soil or subsoil shall not be placed in low areas where natural drainage or storm water could pond or erode these materials during inclement weather.
- 2.11.1.4 Temporary erosion control measures shall be provided to prevent excessive runoff on to adjacent sites or water courses, or where a soil or subsoil erosion hazard exists. Temporary measures may include mulching, diking, ponding, terracing or other means to reduce surface water flow effects.
- 2.11.1.5 Appropriate measures shall be taken to ensure that no spillage of fuels, toxic construction materials, or other toxic wastes occurs, and where use of such materials is necessary, to ensure that adequate containment facilities and clean-up equipment are utilized.
- 2.11.1.6 No toxic or waste materials shall be dumped into water courses or any other water body either on or off the job site.

- 2.11.1.7 No toxic materials, fertilizers, or fuels shall be stored adjacent to water courses, ~~or~~ in a location where spillage could result in seepage into a water course.
- 2.11.1.8 All toxic wastes and other construction material shall be disposed of in a manner acceptable to the owner and in accordance with municipal, provincial and federal regulations.

2.11.2 Site Protection

- 2.11.2.1 All existing and new plants, site services, curbs, paving, structures, finishes and all other features shall be protected against damage during the work. Damage shall be reported (see 2.14) and shall be completely repaired to the satisfaction of the Authority.

2.12 SAFETY

- 2.12.1 The Contractor shall comply with all applicable laws, bylaws, rules, regulations and lawful orders of any public authority having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss.
- 2.12.2 The Contractor shall erect and maintain, as required by existing conditions and progress of the work, all reasonable safeguards for safety and protection, as required by the Workers' Compensation Board.
- 2.12.3 The Contractor shall provide barricades, safety guards, and/or warning devices for purposes of controlling traffic and pedestrians whenever necessary for the protection of persons and property.

2.13 CHEMICALS

- 2.13.1 Handling and application of all chemicals, including but not limited to herbicides, pesticides, fungicides and insecticides, shall be done solely by persons legally certified to do so under provincial and federal legislation.
- 2.13.2 Use, handling and disposal of chemicals shall comply with all applicable legislation and regulations, including, but not limited to, the federal Pest Control Products Act, Fisheries Act, and Food and Drugs Act; and the provincial Pesticide Control Act, Wildlife Act, Weed Control Act, Plant Protection Act, and Waste Management Act, as well as any municipal or regional district legislation.

2.14 REPORTING DAMAGE

Notification of danger or damage to property, site features or the environment shall be given at once, verbally, and where necessary in writing, to the Authority and to the appropriate public agencies or authorities responsible for the safety and repair of such property as public utilities or for protection of the environment.

2.15 WATER

Water used for the work shall be free from any organic or chemical contaminants detrimental to healthy plant growth.

Planning, scheduling and execution of the work shall include measures to ensure a supply of water for landscape purposes in adequate amounts and at adequate pressures for satisfactory irrigation of all plants.

Planning of the work shall include provision of a satisfactory means of water distribution. Such means include, but are not limited to, automatic sprinkler systems, drip systems, hose bibbs and connection points, and truck-mounted water tanks.

2.16 INSURANCE

2.16.1 Unless other provisions are agreed to, the Contractor shall provide, maintain and pay for insurance for the duration of the work, providing at least the following coverages for the following categories of risk.

- a) Comprehensive General Liability Insurance protecting the Owner, the Contractor, his subcontractors, and their respective servants, agents or employees against damage arising from personal injury (including death) and against claims for property damage that may arise directly or indirectly out of the operations of the Contractor, his subcontractors, servants, agents or employees. The amount of coverage shall be not less than \$1,000,000 inclusive for any one occurrence. This policy shall contain a standard cross liability clause, and shall cover all liability arising out of products, whether manufactured or supplied by the Contractor, contingent employer's liability and liability assumed by the Contractor under and applicable to the contract for the work.
- b) Automobile Insurance on the Contractor's owned and non-owned vehicles, protecting the Contractor and the Owner against damages arising from bodily injury (including death) and against claims for property damage arising out of their use on the operations of the Contractor, his subcontractors, or agents. The amount of coverage shall be not less than \$1,000,000 inclusive for any one occurrence.

3. SITE PREPARATION

3.1 GENERAL

3.1.1 Pertinent Standards and Legislation

3.2 EXECUTION

3.2.1 Clearing and Grubbing

3.2.1.1 Trees or vegetation zones to be protected shall be clearly and accurately identified and located on site plans and by flagging on site before and during clearing and grubbing operations.

3.2.1.2 The Standard in 3.2.2 for protection of existing trees and vegetation shall be adhered to during clearing and grubbing operations.

3.2.1.3 Clearing and grubbing shall be done according to *appropriate sections in the*
Fed. Air Act

3.2.1.4 Non-normal or unusual subsurface conditions encountered during clearing and grubbing shall be reported. See Administration Recommendations for recommended reporting procedures.

3.2.1.5 Cleared and grubbed material shall be stockpiled in a location separate from growing medium stockpiles, and where noxious or undesirable weeds are on site, grubbed materials shall not be mixed with the growing medium.

3.2.2 Preservation of Existing Vegetation

3.2.2.1 Identification of Vegetation for Preservation

3.2.2.1.1 Prior to any disruption of the existing project site, vegetation intended for preservation should be inspected by a competent landscape architect, horticulturist or arborist. No plant material left standing on the site should be exempt from thorough inspection for health and safety.

3.2.2.1.2 Vegetation areas or specimens intended for preservation should be identified on site plans at an appropriate scale prior to any site work commencing.

3.2.2.1.3 Any trees on hardpan, rock, or muck soils, any large open-grown trees, trees in forest overstory that has been thinned or opened up, and trees that exhibit surface rooting or growth on nurse material shall be judged as potentially hazardous and require prior inspection.

3.2.2.1.4 Any trees exhibiting abnormal growth such as narrow crotch angles, extreme branch length, stem fluting, spiral growth, incipient or active decay, broken leader or topping, excessive stem curvature or lean, or trees exhibiting unthrifty growth, should not be retained without prior inspection.

3.2.2.1.5 A landscape architect or professional arborist should provide on-site instructions to the Contractor and equipment operators regarding the location of trees to be preserved, and methods to be employed for protection.

3.2.2.1.6 Relocation or transplanting of movable plant material should preferably be done before any major site development occurs.

3.2.2.2 Retention of Existing Vegetation

3.2.2.2.1 No building materials, oil, paint or construction debris shall be stored, dumped or leaned against trees or permitted in vegetation retention areas.

3.2.2.2.2 No machinery shall travel through or within vegetation retention areas or under the crown of retention trees.

3.2.2.2.3 Stockpiling of soil, construction materials or excavated materials shall not be permitted in retention areas or under the branch spread of retention trees.

3.2.2.2.4 No vehicles shall be parked, fueled or serviced within vegetation retention areas or under the crowns of trees to be retained.

3.2.2.2.5 No debris disposal fires, clearing fires or trash burning shall be permitted within vegetation retention areas or under the crown of any tree to be retained.

3.2.2.2.6 No excavation, drain and service trenches, nor any other disruption, shall be permitted within vegetation retention areas or under the crowns of retention trees without a review of the proposed encroachment by a landscape architect or professional arborist.

~~3.2.2.2.7~~

3.2.2.2.8 Physical barriers such as snowfence or clearly visible flagging shall be used to delineate clearing boundaries. Snowfence or similar fencing should be supported on metal or wood stakes at least 5 metres from the base of mature trees to be retained.

3.2.2.2.9 There shall be no cutting of branches or roots of retention trees without the approval of a landscape architect or professional arborist.

- 4.3.3 Debris, roots, branches, stones, building material, contaminated subsoil, visible weeds and anything else that may interfere with the proper growth and development of the planned finished landscaping shall be removed.
- 4.3.4 Fill materials shall be placed so as to achieve stability. This may necessitate placing in lifts of 225 mm and compacting each layer to 80-85% standard proctor density.
- 4.3.5 Areas showing excessive compaction shall be scarified to a minimum depth of 150 mm and compacted to 80-85% standard proctor density. All subgrade shall be scarified to a minimum depth of 150 mm immediately before placing growing medium.
- 4.3.6 Gradients should be within the ranges shown in Table 2, except where the designer has called for variation from this standard based on particular conditions.
- 4.3.7 Grade transitions of subgrade should be smooth and even, and shall be such that ponding cannot occur on the subgrade surface.
- 4.3.8 See Section 6 (Growing Medium) for placement and finish grading of growing medium.

TABLE 2. MAXIMUM AND MINIMUM GRADIENTS IN LANDSCAPED AREAS

<u>Location</u>	<u>Minimum</u>	<u>Maximum</u>
Lawn and Grass	50:1 (2%)	3:1
Grass Swales (without additional erosion protection)		
(i) Slope Along Invert	50:1 (2%)	10:1 (10%)
(ii) Side Slopes	6:1 (preferred)	3:1 4:1
Unmowed Areas	100:1 (1%)	2:1* 3:1
Planted Areas	50:1 (2%)	2:1* 3:1

* Varies with soil types, cut vs fill, and other stabilizing procedures.

5. DRAINAGE

5.1 GENERAL

5.1.1 Intent

- 5.1.1.1 Surface and subsurface drainage systems shall be provided, as appropriate, for the collection and disposal of storm drainage and subsurface water.
- 5.1.1.2 These systems shall provide for the safety and convenience of the occupants and the protection of dwellings, other improvements, and usable lot areas from water damage, flooding and erosion. Where storm drainage is concentrated, permanently maintainable facilities shall be provided to prevent significant erosion and other damage or flooding on the site or on adjacent properties.
- 5.1.1.3 Appropriate measures shall be taken, particularly during construction, to prevent siltation of existing drainage systems and water courses.

5.1.2 Scope

- 5.1.2.1 This Section includes standards for products and execution for work occurring within "soft landscaped" areas within the site of the work.

Appropriate measures and installations shall be made off-site and as part of the "hard" construction to ensure that the objectives of this Section can be met.

5.1.3 Pertinent Standards and Legislation

- (a) CMHC - Roof Decks Design Guidelines
- (b) CSA - B 181.1 - 1977, Plastic Drain and Sewer Pipe Fittings
- B 182.11 - 1967, Recommended Practice for the Installation
of Plastic Drain and Sewer Pipe Fittings
- (c) CMHC - Site Grading Handbook

5.2 MATERIALS

5.2.1 Rigid Plastic Pipe

PVC or polyethylene conforming to CSA B 182.1 - M1977.

5.2.2 Flexible Plastic Pipe

clay pipe etc
shall be durable and conform to appropriate
shall be utilised to manuf. specs and. current pract.

5.2.3 Drain Rock

Drain rock shall be clean, round, inert, and durable, and have a maximum size of 19 mm and shall contain no material finer than 10 mm.

5.2.4 Filter Fabric / Soil Separator

A ^{non biodegradable} blanket or other filtering membrane that will allow the passage of water but not fine soil particles shall be used to separate the growing medium from drain rock.

5.2.5 Drainage Structures

Silt traps, culverts, area drains, sumps, and catch basins shall be located and designed to achieve the intent set out in 5.1.1.

5.3 EXECUTION

5.3.1 During Construction

Provision shall be made for proper water management and drainage of the site during construction. This shall include silt traps, erosion control measures, temporary water collection ditches, as well as their adequate maintenance during the construction period.

5.3.2 Secondary Drains

Pipe drains of adequate size from minor runoff concentration points shall be provided and connected to appropriate disposal lines when analysis indicates that they are necessary. Pipe drains are necessary when collected surface water flowing in swales may cause erosion of landscaped areas, or when water flow may interfere with pedestrian or vehicular traffic, or when volume collected becomes excessive.

5.3.3 Drainage Swales and Gutters

Paved gutters shall have a minimum grade of 0.5%. Paved gutters and unpaved drainage swales shall have adequate depth and width to accommodate the maximum foreseeable runoff without overflow. Swales and gutters shall be seeded, sodded, sprigged or paved as appropriate to minimize potential erosion.

5.3.4 Open Channels

Channels shall be protected from erosion by appropriate vegetative covers, lining, or other treatment indicated as necessary by analysis. Earthen channel side slopes shall be no steeper than 2 to 1, and shall be flatter to prevent erosion where analysis indicates the need.

Open channels with lining shall have a maximum gradient on side slopes of 67% (1-1/2:1), with adequate provisions for weep hole drainage. Channel side slopes steeper than 67% shall be designed as structural retaining walls with provision for live and dead surcharge load.

5.3.5 Drainage Pipe

Drainage pipe shall be installed with straight slopes to drains, smooth transitions and all appropriate fittings. Cleanout risers shall be installed where junctions, grade or direction changes may cause siltation within drain lines. Connections at sumps or catch basins shall be made by breaking out at the correct elevation and patching around the pipe with grout concrete to make a tight, durable seal. Minimum slope for drain pipes shall be 0.5%.

5.3.6 Bedding

Drainage pipe shall be installed on bedding material to CSA B 182.11 and shall have the required cover of drain rock and filter fabric.

5.3.7 Over Structures

- 5.3.7.1 Drainage for landscaped areas over structures shall be designed to adequately drain the planting medium, as recommended in CMHC Roof Decks - Design Guidelines.
- 5.3.7.2 Appropriate products, such as protection board, shall be used to adequately protect underlying surfaces and waterproofing when drainage materials and soil are to be installed. Installation procedures for drain rock, etc. shall be such that this protection is maintained in its intended position.
- 5.3.7.3 Where drain rock is installed under growing medium over structures, it should be to a minimum depth of 100 mm and the surface shall be completely covered with filter fabric. Filter fabric shall be lapped a minimum of 150 mm and fitted tightly around drains and other features.
- 5.3.7.4 Access shall be provided to all drains in planting areas for purposes of inspection and cleaning.

6. GROWING MEDIUM

6.1 GENERAL

NOTE: BEFORE ADOPTING THIS STANDARD FOR GROWING MEDIUM, IT SHOULD BE REVIEWED BY THE LANDSCAPE ARCHITECT, AND A MODIFIED GROWING MEDIUM SHOULD BE SPECIFIED IF NEEDED TO SUIT PARTICULAR SITE CONDITIONS AND PLANT TYPES.

6.1.1 Related Standards and Legislation

- (a) Canadian National Master Construction Specification, 02260 Topsoil and Finish Grading.
- (b) Canadian System of Soil Classification.

6.1.2 This Standard and Testing

6.1.2.1 In this Standard, a range of measurable physical and chemical properties are set out as being acceptable in a growing medium. Compliance with the Standard is to be determined by testing for those properties. When imported or on-site soil is used, it shall be tested (see Testing) and modified as necessary by the admixture of other components to bring its properties within the ranges set in 6.2.2 for growing medium.

6.1.2.2 When bidding, a contractor should test, or have his supplier test, the proposed soil and include the required modifications in his price for the work.

6.1.3 Applications

6.1.3.1 Three different growing medium types are described in this Standard for different applications. The applications are:

- (a) Low Traffic Lawn Areas, trees and large shrubs.
- (b) High Traffic Lawn Areas, having regular pedestrian traffic. This growing medium has relatively high structural strength but will require more care due to lower water and nutrient capacity.
- (c) Growing Medium for Planting Areas, such as for shrub and ground cover areas and in planters. This growing medium is similar to that for low traffic lawn areas, but has higher organic content and slightly lower pH. This may be achieved by adding peat moss to growing medium for low traffic lawn areas.

6.2 PRODUCTS

6.2.1 On-Site Soil

6.2.1.1 On-site soil may be used, provided that it meets the standard set for imported topsoil and can be modified to meet the requirements set out for growing medium.

- 6.2.1.2 All areas designated for paving, or the construction of structures, shall be stripped of all topsoil and organic matter.
- 6.2.1.3 Topsoil shall be stripped to its full depth, taking care not to mix topsoil with subsoil.
- 6.2.1.4 Topsoil stripping shall be commenced after the area has been cleared of all scrub, plants, weeds, grass, stumps, rocks 100 mm and over, and other extraneous materials. Such materials shall be removed from the site.
- 6.2.1.5 If testing shows it to be suitable for landscaping, a sufficient quantity of stripped topsoil shall be stockpiled where shown on drawings or in areas designated for stockpiling in accordance with construction planning and scheduling.
- 6.2.1.6 Do not handle topsoil while in a wet or frozen condition or in any manner in which the structure is adversely affected.

6.2.2 Imported Topsoil

- 6.2.2.1 Imported topsoil shall be friable loam, neither heavy clay nor of very light sandy nature, containing a minimum of 4% organic matter for clay loams and 2% for sandy loams, to a maximum of 20% by volume. Topsoil shall be free from subsoil, roots, noxious grass, weeds, toxic materials, stones over 30 mm, foreign objects, and with an acidity range (pH) of 5.5 to 7.5. Topsoil shall be free from crabgrass, couchgrass, equisetum or noxious weeds or seeds or parts thereof.
- 6.2.2.2 Freedom from rock or debris shall be such that of the particles, 95-100% pass a 25.4 mm standard sieve and 85-100% pass a 9.51 mm standard sieve.
- 6.2.2.3 The population of any single species of plant pathogenic nematode shall not exceed 1000 per litre of growing medium.

6.2.3 Peat Moss

- 6.2.3.1 Peat moss shall be Horticultural grade, partially decomposed fibrous or cellular stems and leaves of Sphagnum Mosses with a texture varying from porous to spongy fibrous, fairly elastic and substantially homogeneous with a pH value of not less than 3.5 and not greater than 4.5, free of decomposed colloidal residue, wood, sulphur and iron, brown in colour and medium to coarse shredded, suitable for horticultural purposes.
- 6.2.3.2 Salinity: the saturation extract conductivity shall not exceed 2.0 millimhos/cm at 25° C.
- 6.2.3.3 Organic content: shall be no less than 90% based on dry weight as determined by ash analysis.

6.2.3.4 Nitrogen: shall be no less than 0.8% based on dry weight.

6.2.3.5 Particle size: 95-100% passing a 9.5 mm standard sieve.
0-15% passing a 500 micron standard sieve.

6.2.4 Sand

6.2.4.1 Sand shall be hard, granular sharp sand to CSA A82.50-M1976, well washed and free of impurities, chemical or organic matter.

6.2.4.2 Particle size in sand shall be such that:
95-100% pass a 4.76 mm standard sieve
0-40% pass a 500 micron standard sieve
0-5% pass a 53 micron standard sieve.

6.2.5 Manure

6.2.5.1 Manure shall be well-rotted farm animal manure, rotted to the extent that liquids have been eliminated, and the material is crumbly, free from weed seeds, rocks, sticks, rubble and containing not more than 40% (forty percent) sawdust, straw or shavings.

6.2.5.2 Manure shall be free of harmful chemicals such as any used to artificially hasten decomposition, and shall have salt content that gives an electrical conductivity reading of less than 0.5 mmho/cm.

6.2.5.3 Manure shall contain not less than 1.0% nitrogen based on dry weight.

6.2.5.4 All particles in manure shall pass a 6.35 mm standard sieve.

6.2.5.5 Manure shall be free of viable seed, maximum two plants per litre of manure.

6.2.6 Wood Residuals

6.2.6.1 Where wood residuals such as fir or hemlock sawdust are present in the growing medium, their quantities and properties shall be such that the total Carbon to total Nitrogen ratio is a maximum of 40:1 as required in 6.2.9.12.

6.2.6.2 Cedar or redwood sawdust shall not be present in growing medium.

6.2.7 Fertilizers

6.2.7.1 Chemical Fertilizers

6.2.7.1.1 Fertilizers shall be standard commercial brands, meeting the requirements of the Canada Fertilizer Act.

- 6.2.7.1.2 All fertilizers shall be in granular, pelletal or prill form, and shall be dry, free-flowing and free from lumps.
- 6.2.7.1.3 The fertilizers shall have a guaranteed N-P-K analysis.
- 6.2.7.1.4 Fertilizer shall be packed in standard waterproof containers, clearly marked with the name of the manufacturer, weight and analysis.
- 6.2.7.1.5 All fertilizer shall be stored in a weatherproof storage place and in such a manner that it will stay dry and its effectiveness is not impaired.
- 6.2.7.1.6 Fertilizers shall include, but not be limited to, those shown in Table 3.

TABLE 3: CHEMICAL AMENDMENTS (FERTILIZERS)

NAME	MINIMUM PROPORTION BY WEIGHT	MAIN ELEMENT
Ammonium nitrate	33.5%	N
Ammonium sulfate	21%	N
Superphosphate (0-20-0)	8.5%	P (20% P ₂ O ₅)
Superphosphate (0-45-0)	19.5%	P (45% P ₂ O ₅)
Potassium sulfate	41.5%	K (50% K ₂ O)
Potassium chloride (muriate)	50%	K (60% K ₂ O)
Potassium nitrate	13%	N
	36.5%	K (44% K ₂ O)
Iron sulfate	20%	Fe, as metallic
Gypsum	23%	Ca
Rock or oyster shell lime, limestone flour	40%	Ca
Dolomite lime	20%	Ca
	13%	M
Bonemeal	20%	Phosphoric acid
	3%	N

(Bonemeal, gypsum and limes shall be finely ground, to 12 mesh or finer)

6.2.8 Growing Medium

- 6.2.8.1 Growing medium is any soil, soil substitute, or mixture whose chemical and physical properties fall within the ranges required by this Standard for a particular application.
- 6.2.8.2 Growing medium shall be free of plants or their roots, sticks, building materials, wood chips (in excess of 1 cm in maximum dimensions), chemical pollutants, and other extraneous materials not contributing to the generally desirable physical and chemical properties for landscaping purposes.
- 6.2.8.3 Growing medium shall require not more than 0.5 kg/m² (100 lb per 1000 ft²) of dolomite lime to reach the required pH level.
- 6.2.8.4 Fertility (nitrogen, phosphorus and potassium) and pH may be modified after growing medium is placed, by the incorporation of lime and fertilizers, or by incorporating these chemicals when mixing and screening.
- 6.2.8.5 Salinity - the saturation extract conductivity shall not exceed 3.0 millimhos/cm at 25° C.
- 6.2.8.6 Boron - the concentration in the saturation extract shall not exceed 1.0 ppm.
- 6.2.8.7 Sodium - the sodium adsorption ratio (SAR) as calculated from analysis of the saturation extract shall not exceed 8.0.
- 6.2.8.8 Total Nitrogen shall be 0.2% to 0.4% by weight.
- 6.2.8.9 Available Phosphorus shall be 50 to 70 ppm.
- 6.2.8.10 Available Potassium shall be 50 to 100 ppm.
- 6.2.8.11 Cation Exchange Capacity shall be 30 to 50 meq.
- 6.2.8.12 Carbon to Nitrogen Ratio shall be not more than 40:1.
- 6.2.8.13 Acidity shall be within the pH range shown in Table 4 for the intended application.
- 6.2.8.14 Texture: Particle sizes and proportions of each size particle shall be within the ranges shown in Table 4 for the intended application.
- 6.2.8.15 Organic Content shall be within the ranges shown in Table 4 for the intended application.

- 6.2.8.16 Drainage of growing medium can be measured only after the growing medium is in place. Mixing and handling of growing medium shall be done in such a manner that the minimum saturated hydraulic conductivity shown in Table 4 is achieved.
- 6.2.8.17 Tolerances: Samples of the growing medium taken just before planting shall have the above properties to within tolerances of +20%, except for salinity, which shall be less than the stated limit.

TABLE 4 : PROPERTIES OF GROWING MEDIUM FOR DIFFERENT APPLICATIONS.

PROPERTIES	LOW TRAFFIC LAWN AREAS, TREES AND LARGE SHRUBS	HIGH TRAFFIC LAWN AREAS	PLANTING AREAS, PLANTERS, SHRUB AND GROUNDCOVER AREAS
<u>TEXTURE:</u>			
Particle Size Classes by the Canadian System of Soil Classification		Percent of Dry Weight Mineral Fraction (%)	
Gravel greater than 2 mm less than 75 mm	0 - 10	0	0
Sand greater than 0.05 mm less than 2 mm	50 - 70	80 - 90	50 - 70
Silt greater than 0.002 mm less than 0.05 mm	10 - 30	5 - 20	10 - 30
Clay less than .002 mm	7 - 20	2 - 5	7 - 20
<u>ACIDITY (pH):</u>	6.0 - 6.5	6.0 - 6.5	5.0 - 6.0
<u>DRAINAGE:</u>			
Minimum saturated hydraulic conductivity (cm/hr) in place	2.0	7.0	2.0
<u>ORGANIC CONTENT:</u>			
Percent of Dry Weight (%)	5 - 10	3 - 5	25 - 30

6.3 EXECUTION

6.3.1 Growing Medium

- 6.3.1.1 ^{Commercial} All processing and mixing of growing medium components shall be done thoroughly by a mechanized screening process. No hand mixing shall occur. The resulting product shall be a homogeneous mixture having the required properties throughout.
- 6.3.1.2 Moisture content of peat moss at the time of mixing shall be not less than 60% to 75%. Peat moss shall form a ball when squeezed and retain this upon release of pressure. Insufficient moisture will result in the peat moss not holding together, while excessive moisture is evident when the ball formed is pliable with a clear water sheen on the surface.
- 6.3.1.3 Growing medium shall not be prepared or handled in a wet or frozen condition.

6.3.2 Placing Growing Medium

- 6.3.2.1 Note: The subgrade shall be examined before placing growing medium, and any variation from the requirements of Section 4 shall be reported before placing of growing medium. (Refer to 1.1.7.)
- 6.3.2.2 The subgrade shall be scarified to a minimum depth of 150 mm immediately before placing growing medium.
- 6.3.2.3 Growing medium shall be placed over prepared subgrade and shall be allowed to settle or compacted by light rolling such that it is firm against deep footprints. Growing medium shall not be compacted more than is necessary to meet this requirement.
- 6.3.2.4 Growing medium shall be moist (25% to 75% of field capacity) but not wet when placed, and shall not be handled if it is frozen or so wet that its structure will be altered.
- 6.3.2.5 Table 5 sets out the minimum depths of growing medium after settlement for various types of subgrade.

6.3.3 Fertilizers

- 6.3.3.1 Fertilizers shall be added to bring growing medium fertility within the ranges set out in this Standard.
- 6.3.3.2 Lime (if required) and potassium (if required) may be added to the growing medium at the time of screening. All other fertilizers (such as nitrogen, phosphorus and micronutrients) shall be added to the growing medium by thorough cultivation after it is in place (if required).

TABLE 5 : MINIMUM GROWING MEDIUM DEPTHS

APPLICATION	MINIMUM GROWING MEDIUM DEPTHS		
	OVER PREPARED SUBGRADE		OVER STRUCTURES
	Where the subsoil has a medium (loamy) texture	Where the subsoil has a coarse (sandy) or fine (clay) texture	
Low traffic lawn areas			
i) irrigated	100 mm (4")	150 mm (6")	150 mm (6")
ii) not irrigated	100 mm (4")	150 mm (6")	225 mm (9")
High traffic lawn areas	100 mm (4")	150 mm (6")	-----
Planting medium			
i) ground cover areas	150 mm (6")	300 mm (12")	225 mm (9")
ii) shrub areas - small shrubs	300 mm (12")	450 mm (18")	300 - 500 mm (12 - 20")
iii) shrub areas - large shrubs	450 mm (18")	600 mm (24")	500 - 900 mm (20 - 36")
iv) tree pits	225 mm (9") on sides and bottom of rootball	300 mm (12") on sides and bottom of rootball	See Table 10

6.3.3.3 Fertilizers shall be spread evenly over the growing medium with a suitable mechanical spreader.

6.3.3.4 Fertilizers shall be fully incorporated to a minimum depth of 150 mm, except in lawn areas, where they shall be incorporated to a depth of 50 mm.

6.3.3.5 There should be at least one week separation between the application of lime and fertilizers other than lime.

6.3.4 Finish Grading

6.3.4.1 The growing medium shall be fine graded after placing to the finish elevations and contours required. Rough spots and low areas shall be eliminated to ensure positive surface drainage.

6.3.4.2 The surface shall be finished smooth, uniform, firm against deep footprinting with a fine loose surface texture.

7. SEEDING AND SODDING

7.1 GENERAL

7.1.1 Classes

Establishment of grass can occur in a range of conditions from highway and industrial use to fine residential lawns. The following three classes and corresponding standard characteristics are recommended for designating the standard required for a particular project or area.

7.1.1.1 Class 1 Areas (Lawn)

Uses: High profile building sites, areas around public entrances to buildings of lower profile, small urban and suburban sites. This is the minimum standard for residential and commercial areas.

Growing Medium: To the requirements of Section 6. Depth of growing medium as shown in Table 5.

Gradient Standards: As shown in Table 2.

Drainage: Collected and dispersed via standard means: storm sewer, existing water course.

Seed: Canada #1 or sod of the same quality.

7.1.1.2 Class 2 Areas (Grass)

Uses: Large suburban sites, public areas around large facilities with park-like conditions, industrial sites.

Soil: Satisfactory existing soil cleaned to 100 mm depth of rocks and debris over 25 mm in any dimension.

Gradient Standards: As shown in Table 2. Minor grade irregularities acceptable if ponding is not created.

Drainage: Collected and dispersed via standard means: storm sewer, existing water course.

Seed: Canada #2 lawn and turf grass mixture or sod.

7.1.1.3 Class 3 Areas (Rough Grass)

Uses: Rural sites, verges of airport runways, farms, highway rights-of-way, temporary grass cover.

Soil: Existing soil cleaned by mechanical means of debris over 50 mm in any dimension.

Gradient Standards: Roughly graded for ease of maintenance and positive surface drainage.

Drainage: Collected and dispersed via standard means or held in an area intended for ponding.

Seed: Selected to suit soil, maintenance and climate conditions.

7.1.2 Pertinent Standards and Legislation

(a) Canada Seed Act

7.1.3 Handling and Storage

All grass seed and nurse crop seed, hydraulic mulch, fertilizers and related materials, where required, shall be stored in a dry, weatherproof storage place and shall be protected from damage by heat, moisture, rodents or other causes until time of seeding. Labels or other identification shall not be removed or defaced.

Sod shall be protected during transportation to prevent drying out and shall arrive at the site in a fresh and healthy condition.

Sod shall be installed as soon as possible after arrival. If there is any delay in installation, the sod shall be kept moist and cool at all times until installation.

During the growing season, sod shall be installed within 24 hours of delivery to the site.

7.1.4 Finish Grade Preparation

The finished grade shall be smooth to the extent required for the class of seeding or sodding to be carried out, firm against footprints, loose textured, and free of all stones, roots, branches, etc. larger than the diameter required for removal for the class of seeding or sodding to be carried out.

Areas that are compacted shall have their surfaces loosened by means of a thorough scarification, discing or harrowing, to a minimum of 100 mm depth.

Before commencement of seeding or sodding operations, approval of site preparation should be obtained. See Administration Recommendations.

7.1.5 Recommended Conditions for Acceptance

Acceptance of grass areas by the Authority and by the Owner for further maintenance should be done only when the following conditions exist.

- 7.1.5.1 Growing medium quality, fertility levels, depths and surface conditions are as set out in this Standard.
- 7.1.5.2 Grasses are the required varieties, free of varieties other than those specified.
- 7.1.5.3 Grass areas are relatively free of weeds, containing no more than two (2) broadleaf weeds or ten (10) annual weeds or weedy grasses per 40 square metres (47.8 square yards).
- 7.1.5.4 Sod is sufficiently established that its roots are growing into the underlying growing medium.

- 7.1.5.5 Sodded areas have been mown at least once, to a height of 38 mm.
- 7.1.5.6 Seeded areas have been mown at least twice, to a height of 38 mm, the last mowing being within 48 hours of the inspection for Acceptance.
- 7.1.5.7 Grasses shall be established in sufficient density that no surface soil will be visible when they are mown to a height of 38 mm.
- 7.1.5.8 Maintenance procedures set out in 7.3.3 have been carried out.

7.2 PRODUCTS

7.2.1 Grass Seed

- 7.2.1.1 Grass seed shall meet the requirements of the Canada Seed Act for Canada No. 1 seed. Where specified, all nurse crop seed shall meet the requirements of the Canada Seed Act for Canada No. 1 seed.
- 7.2.1.2 Seed mixtures shall be suited to the climate, terrain, establishment and maintenance conditions under which they are to be grown. Professional consultation is recommended in selecting or designing seed mixtures.
- 7.2.1.3 Seed shall have minimum germination rate of 75% and minimum purity of 97%, except where otherwise required by the professional selecting the seed mixture.
- 7.2.1.4 Seed shall be packed and delivered in original containers clearly showing:
 - (a) name of supplier
 - (b) analysis of seed mixture
 - (c) percentage of pure seed
 - (d) year of production
 - (e) net weight (mass)
 - (f) date and location of bagging
- 7.2.1.5 The mixture shall be mixed and supplied by a recognized seed house.
- 7.2.1.6 The Owner may test seed for purity and germination.

7.2.2 Hydraulic Mulch

- 7.2.2.1 Hydraulic mulch shall consist of fibre or other material designed for hydraulic seeding and dyed for ease of monitoring application.

- 7.2.4.5 The mowing height limit shall be 38 mm (1-1/2") to 64 mm (2-1/2"), and the thickness of the soil portion of the sod shall not exceed 25.4 mm (1") or be less than 16 mm (5/8").
- 7.2.4.6 Grasses in sod shall be of sufficient density that no surface soil will be visible when mowed to a height of 38 mm (1-1/2").

7.3 EXECUTION

7.3.1 Seeding

7.3.1.1 Scheduling

Seeding shall be carried out during periods that are most favourable for the establishment of a healthy stand of grass. All seeding shall be done during calm weather and on soil that is free of frost, snow, and water. See ~~Table 6 for recommended dates for seeding.~~

standing

~~TABLE 6: RECOMMENDED DATES FOR SEEDING~~

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7.3.1.2 Methods

Seed shall be applied by Method A (Mechanical Dry Seeding) or Method B (Hydraulic Seeding) unless otherwise specified. Hand seeding is not recommended, and shall be carried out only when site conditions preclude the above two methods.

7.3.1.3 Rates of Application

Rates of application of fertilizers, seed mixtures, mulch and other components shall be based on an analysis of the season, climate, terrain, soil, and establishment and maintenance conditions affecting the project.

7.3.1.4 Method A (Dry Seeding)

- 7.3.1.4.1 The required fertilizer shall be applied to and well worked into the topsoil by discing, raking, or harrowing at the rate required.

- 7.3.1.4.2 Seed shall be applied by means of an approved mechanical dry seeder at the rate required.
- 7.3.1.4.3 Seed shall be applied in two intersecting directions, except where conditions dictate seeding in one direction only.
- 7.3.1.4.4 All grass seed, nurse crop seed, water, fertilizer, and mulch shall be measured accurately before being applied.
- 7.3.1.4.5 Mulch may be applied with seed or immediately following seeding with an approved mulcher. No area shall be seeded in excess of that which can be mulched on the same day.
- 7.3.1.4.6 The mulch shall be applied to form an even, uniform mat over the entire area.

7.3.1.5 Method B. (Hydraulic Seeding)

7.3.1.5.1 Equipment

- (a) Seed, fertilizer and hydraulic mulch shall be applied, in the various combinations described in this specification, with an hydraulic seeder/mulcher.
- (b) All hydraulic seeding/mulching equipment shall have the tank volume certified by an identification plate or sticker which shall be affixed in plain view on the equipment and shall not be removed or altered.
- (c) The hydraulic seeder/mulcher shall be capable of sufficient agitation to mix the materials into a homogeneous slurry and to maintain the slurry in a homogeneous state until it is applied. The discharge pumps and gun nozzles shall be capable of applying the materials uniformly over the designated areas.

7.3.1.5.2 Protection

- (a) Hydraulic seeding shall be done with care to ensure that fertilizer in solution does not come in contact with the foliage of any trees, shrubs, or other susceptible vegetation. Seed or mulch shall not be sprayed on objects not expected to grow grass.
- (b) Existing site equipment, roadways, landscaping, reference points, monuments, markers and structures shall be protected from damage.
- (c) Any overspray or damage that occurs during hydraulic seeding shall be promptly rectified.

7.3.1.5.3 Application (Hydraulic)

- (a) Seed, fertilizer and hydraulic mulch shall be thoroughly mixed in a water slurry and shall be distributed uniformly over the surface area with an approved hydraulic mulcher.
- (b) The quantities of each of the materials to be charged into the hydraulic seeder/mulcher tank shall be accurately measured either by mass or by a commonly accepted system of mass-calibrated volume measurements. The materials shall be added to the tank while it is being filled with water, and in the following sequence: seed, fertilizer, and where applicable, mulch. The materials shall be thoroughly mixed into a homogeneous water slurry and shall be distributed uniformly over the surface area with the hydraulic seeder/mulcher.
- (c) Seeds for grass, and legumes shall be kept in separate containers prior to seeding.
- (d) If required, legume seed shall be added to the grass mixture at time of seeding. Legume seed shall be inoculated with standard product humus culture before mixing with grass seed. Inoculated seed shall be protected from exposure to sunlight for periods of over one-half hour. Seed shall be used within eight hours from inoculation or shall be re-inoculated.
- (e) After charging, no water or other material shall be added to the mixture in the hydraulic mulcher.
- (f) Seed, fertilizer, mulch and water slurry shall not be left in the tank for more than 4 hours. Slurry left in the tank over the maximum time shall not be used for seeding and shall be disposed of off-site.
- (g) Wild flower seed, if required, ^{should} shall be applied following grass hydroseeding.

7.3.2 Sodding

- 7.3.2.1 The growing medium under all sodded areas shall be spread evenly over the approved subgrade to the specified depth. The minimum depth of growing medium under sodded areas shall be as shown in Table 5.
- 7.3.2.2 The required fertilizer shall be applied to and well worked into the growing medium by discing, raking or harrowing, at the rates specified. This shall be done within 48 hours before laying sod.
- 7.3.2.3 Sod shall be laid as soon as possible after delivery to prevent deterioration and shall be laid within 24 hours of delivery.

- 7.3.2.4 Sod shall be laid staggered, closely knit together in such a manner that no open joints are visible, and no pieces overlap.
- 7.3.2.5 Sod shall be laid smooth and flush with adjoining grass areas and paving and top surface of curbs unless shown otherwise on the drawings.
- 7.3.2.6 On any slopes of approximately 2:1 and steeper, sod shall be laid lengthwise up the slope, and every row shall be pegged with wooden pegs at intervals of not more than 0.5 metres. Pegs shall be driven flush with sod.
- 7.3.2.7 Wooden pegs, to be used for pegging sod on steep slopes, shall be lath pegs. Pegs shall be of sufficient length to ensure satisfactory anchorage of the sod.
- 7.3.2.8 Erosion control netting shall be installed ~~over~~ sodded areas where required.
- 7.3.2.9 Where required, erosion control mesh or netting shall be placed and secured with stakes or staples sunk firmly into the ground to a minimum depth of 150 mm at maximum intervals of 4.5 metres along the pitch of the slope. Stakes or staples shall be placed horizontally across the slope at intervals equal to the width of the mesh or netting minus 15 cm and driven flush with the top of the sod.
- 7.3.2.10 New sod shall be protected from heavy foot traffic during laying. Planks shall be placed if necessary to prevent damage.
- 7.3.2.11 Sod shall be cut where necessary only with sharp tools.
- 7.3.2.12 The sodded area shall be rolled, tamped, or planked providing sufficient pressure, to ensure a good bond between sod and growing medium.
- 7.3.2.13 The sod area shall be watered immediately with sufficient amounts to saturate the sod and upper 100 mm of growing medium.

7.3.3 Grass Maintenance Before Acceptance

- 7.3.3.1 Maintenance for seeded and sodded areas shall begin immediately after sod has been installed or seeding has been completed, and shall continue until the date set for turning the areas over to the Owner for further maintenance.
- 7.3.3.2 Maintenance shall include all measures necessary to establish and maintain grass in a vigorous growing condition, including, but not limited to the following:

- (a) Mowing shall be carried out at regular intervals as required, to maintain grass at a maximum height of 60 mm. Not more than 1/3 of the blade shall be cut at any one mowing. Edges of sodded and seeded areas shall be neatly trimmed. Heavy clippings shall be removed immediately after mowing and trimming.
- (b) Watering shall be carried out when required and with sufficient quantities to prevent grass and underlying soil from drying out.
- (c) Rolling shall be carried out when required to remove any minor depressions or irregularities.
- (d) Weed control shall be carried out when the density of weeds reaches 10 broadleaf weeds or 50 annual weeds or weedy grasses per 40 square metres.
- (e) Weed control, whether manual or chemical, shall reduce the density of weeds to zero.
- (f) Any sodded or seeded areas that show deterioration or bare spots shall be repaired immediately. All areas showing shrinkage due to lack of watering shall be top-dressed and seeded with a seed mix that matches the original seed mix.
- (g) All seeded and sodded areas shall be adequately protected with warning signs, temporary wire or twine fences, or other necessary means.

7.3.4 Clean-up

All materials and other debris resulting from seeding or sodding operations shall be removed from the job site.

8. PLANTS AND PLANTING

8.1 GENERAL

8.1.1 Pertinent Standards and Legislation

Landscape/Paysage Canada Guide Specification for Nursery Stock

8.1.2 Transporting Plants to Site

8.1.2.1 Dormant Period

- (a) Deciduous - Bare Roots (only in dormant period): Adequate protection shall be given in order to preserve moisture around the root system. For short transit period, 4 hours or less, maximum temperature in the truck should be not above 20°. In all cases, at all times, roots should be protected from frost, wind and sun. Example - closed van with wet straw or other suitable material. Temperature to be maintained as uniformly as possible by mechanical means, or in any event to prevent frost damage to roots. Appropriate temperature range to be above 0° centigrade and no more than 10°.
- (b) Evergreens: It is recommended that balls not be subjected to freezing temperatures below -5° centigrade for a period longer than 4 hours and that adequate protection from wind and sun be given to prevent desiccation.

8.1.2.2 Non-Dormant Plants

Deciduous or Evergreens: Movement of container grown, B&B, wire basket should be restricted to closed van or well-covered truck with tarp or similar material in order to protect the leaves or needles from windburn. When in transit with protection of a tarp cover only, it is recommended that foliage be sprayed with an antidesiccant. For the above material in transit for more than 3 days, it should be unloaded and then stored away from direct sun for 24 hours to avoid burning.

8.1.2.3 Unloading Procedures

- (a) B.R. (Bare Root): Roots should be covered and protected immediately from frost, sun and wind.
- (b) Pots/Containers: Should be handled as much as possible by pots only in order to reduce breakage of branches/leaves.
- (c) Ball & Burlap: Handle with caution to maintain the firmness of the balls.

- (d) Wire Basket: Specimen trees should not be lifted by the trunk.
- (e) All plants should be unloaded and checked immediately upon arrival and should be watered if necessary.

8.1.3 Handling and Storage

8.1.3.1 Plants are to be kept in a moist condition at all times. All plants shall be well protected against damage and/or drying out until they are planted on the site.

8.1.3.2 Protection Against Stem Damage:

8.1.3.3 During Growing Season: All plants in containers, B&B, or wire basket, if not planted within 3 days, shall be stored in an upright position, and care should be taken to provide enough space between plants so that light reaches all around to the bottom of the plant in order to avoid burning when planted out.

- (a) Balled & Burlapped Material: Special attention should be given to the rootball, and unless weather is rainy or cool, balls shall be protected by heeling in material suitable to protect them from drying out. (Examples: sawdust, peat moss, topsoil). Plants intended to be planted in the open shall not be kept stored in a building or any area of low light intensity for a period exceeding 7 days. All plants shall be kept well watered and protected from heat and frost.
- (b) Containerized Plants: In extreme weather, freezing or high dry heat, the containers shall be buried in a protective medium. Plants intended to be planted in the open shall not be kept stored in a building, truck, or any area of low light intensity for a period exceeding 7 days during the growing season.
- (c) During Dormant Period: Plants shall be cared for according to each plant's requirement for winter protection needs and according to geographical location.

8.1.4 Planting Time

Plant trees, shrubs and ground covers only during periods that are normal for such work as determined by local weather conditions. See ~~Table 7 for recommended dates for planting.~~

~~TABLE 7. RECOMMENDED DATES FOR PLANTING~~

Table

* substitutions

8.1.5 Recommended Conditions for Acceptance

Acceptance of plants and planted areas by the Authority and by the Owner for further maintenance should be done only when the following conditions exist.

- 8.1.5.1 Growing medium quality, fertility levels, depths and surface grading are as set out in this Standard.
- 8.1.5.2 All plants are in the positions shown in the contract documents (subject to minor amendments by the designer).
- 8.1.5.3 All plants are healthy and turgid.
- 8.1.5.4 Water content in the growing medium is within the ranges set in this Standard.
- 8.1.5.5 All trees are staked as required.
- 8.1.5.6 All pruning is completed as required.
- 8.1.5.7 All planted areas are free of weeds.
- 8.1.5.8 Mulch is in place as required.
- 8.1.5.9 Unmulched areas are cultivated to leave a loose, friable, water-permeable surface.

8.2 PRODUCTS

8.2.1 Plants

- 8.2.1.1 All nursery-grown plants shall, as a minimum, comply with the Landscape/Paysage Canada Guide Specification for Nursery Stock with respect to sizing, grading and quality.
- 8.2.1.2 All collected native plants shall be held and maintained in a nursery until new roots have formed through the burlap or other suitable packing material, or in the case of containerized plants, until such time that the roots grow to fill and hold the soil within the container.
- 8.2.1.3 All plants specified "Container" shall be grown for the length of time necessary to permit the roots to fill and hold the soil within the container, as required by Landscape/Paysage Canada Guide Specification for Nursery Stock.

NOTE: WHERE THE WORKING DOCUMENTS SHOW PLANT SIZE AND CONTAINER SIZE FOR EACH VARIETY, ALL PLANTS SHALL MEET BOTH PLANT SIZE AND CONTAINER SIZE REQUIREMENTS.

- 8.2.1.4 Plants shall be true to name, type and form, and representative of their species or variety. Plants shall be compact and properly proportioned, not weak or thin, or injured by being planted too closely in nursery rows.
- 8.2.1.5 Plants shall have normal, well-developed branches and vigorous, fibrous root systems. They shall be healthy, vigorous plants, free from defects, decay, disfiguring roots, sunscald injuries, abrasions of the bark, plant diseases, insect pests' eggs, borers and all forms of infestation or objectionable disfigurements.
- 8.2.1.6 Trees shall have straight stems unless that would be uncharacteristic and shall be well and characteristically branched for the species or variety.
- 8.2.1.7 Ground cover plants shall have healthy tops to a size proportionate to the above root requirements typical of the species or variety.
- 8.2.1.8 Rootballs and soil in containers shall be free from pernicious perennial weeds.

8.2.2 Planting Accessories

- 8.2.2.1 ~~Hose for protecting bark against chafing by wires or rope shall be new, black two-ply reinforced rubber hose, 13 mm in diameter.~~ *shall be ~~or~~ from*
- 8.2.2.2 Anchors required for the support of guyed trees shall be metal, *guyed* "T" bars, or approved *equal*. Wires for fastening to anchors, *knotted wood* shall be ~~pliable #9 gauge double rope.~~ Eye bolts and turnbuckles required for supporting trees shall be zinc-coated and of sufficient strength to withstand wind pressure, *and*
- 8.2.2.3 *where trees are staked stakes shall be in good condition, secure.* Stakes for support of trees of caliper 2" and less shall be 2" x 2" or 2" diameter by 7' long wood stakes, or metal "T" bar stakes ~~7' long~~. Ties shall be placed around the trunk to provide adequate support and prevent damage. *metal*
- 8.2.2.4 ~~Guy stakes shall be wooden 2" x 2" x 30", or 5/8" x 30" metal stakes.~~

8.3 EXECUTION

8.3.1 Digging of Plants

- 8.3.1.1 Plants specified "BR" (Bare Roots) shall be *dig and* moved while dormant and in accordance with C.N.T.A. standards.

8.3.1.2 Plants specified as "B&B" (Ball & Burlap) shall be dug and planted in accordance with C.N.T.A. specification standards.

8.3.1.3 All plants specified "MTB" shall be ^{dug} moved with a mechanical tree digger. *S pmb*

8.3.2 Preparing Roots

8.3.2.1 Before removing plants from containers for planting, the plants shall be well watered, to reduce injury to the plants and insure a better survival rate.

8.3.2.2 Should water not penetrate the ball (in some cases where the plant has been left dry for too long), the ball should be soaked in a container of water.

8.3.2.3 In many plants, roots have a tendency to circle the ball. When this is apparent outside roots should be gently loosened or cut (with a sharp knife) vertically in one or two places. (Mainly with trees, pines or other large evergreens.)

8.3.3 Planting Pits

8.3.3.1 All trees and shrubs shall have at least 150 mm of growing medium under the rootball and at least 300 mm of growing medium surrounding the rootball to the sides. Where growing medium depth is not sufficient for this, planting pits shall be excavated and filled with growing medium. Excess excavated material shall be removed from the site.

8.3.3.2 Planting pits shall be tested by filling with water. Conditions permitting the retention of water in planting pits for more than 24 hours shall be reported before proceeding with work (see Administration Recommendations, 1.1).

8.3.4 Planting

8.3.4.1 Plants shall be planted so that after settlement they will be at the original growing medium depth. The soil mark on the stem is an indication of this, and it shall be maintained on the finished level, allowing for settling of the growing medium after planting. Total depth of rootballs shall be planted in growing medium.

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

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

synthetic plastic

8.3.4.4 When growing medium is up to about two-thirds of the rootball height, ties shall be cut away and the top portion of burlap on B&B plants shall be folded back. *not disturbing the rootball integrity*

* 8.3.4.5 Soil should be moist in tree pits at this stage, and allowed to settle around the roots. After the water has been absorbed, the backfilling shall be completed and tamped lightly. Any voids shall be brought ^{up} to the intended grade with growing medium. *

8.3.4.6 Wire baskets should not be removed, ~~but~~ the top portion should be folded ^{down} away from the root ball and buried. *Trees planted MTS*

8.3.4.7 All imperishable containers and tying materials shall be removed. Perishable containers such as fibre tubs should be removed, but trees dug B.R. and planted in tubs for summer planting (if not fully established at time of planting) can be planted with the fibre tub if the rim is removed, and large holes cut out on the sides. *Should ensure that holes do not have glazed sides*

8.3.5 Bare Root Planting - While dormant only

8.3.5.1 Damaged or broken roots should be cut back to living parts remaining. Roots should be spread evenly in the planting pit.

8.3.5.2 Growing medium shall be placed around the roots, gently shaking the tree so all the soil particles sift into the root system to ensure close contact with all roots and to prevent air pockets. Avoid direct contact with the roots of fertilizer (except slow release) and also of manure, if used.

8.3.6 Watering

Watering shall be carried out when required and with sufficient quantities to prevent plants and underlying growing medium from drying out.

8.3.7 Pruning

Pruning shall be limited to the minimum necessary to remove dead or injured branches and to compensate for the loss of roots as a result of transplanting operations. Pruning shall be done in such a manner as to preserve the natural character of the plants. Only clean, sharp tools shall be used. All cuts shall be clean and cut to the branch collar, leaving no stubs. Cuts, bruises or scars on the bark shall be traced back to living tissue and removed. The affected areas shall be shaped so as not to retain water, and all treated areas shall be painted with a standard tree paint containing 1% naphthalene acetic acid.

8.3.8 Tree Support

8.3.8.1 Immediately following planting, trees shall be braced upright in position, preventing excessive motion, by guy wires or by stakes with ties in accordance with Table 8:

TABLE 8. TREE SUPPORT METHODS

CONIFEROUS	DECIDUOUS	
Tree Height	Tree Caliper	Tree Support Method
1.5 m to 2.2 m	up to 3.5 cm	1 stake stake with 1 tie
2.2 m to 3.0 m	3.5 cm to 5 cm	2 stakes, 1 tie or 1 stake, 2 ties
3.0 m to 3.7 m	5 cm to 7.5 cm	1 stake, 2 ties
3.7 m to 4.3 m	7.5 cm to 13 cm	3 guys
over 4.3 m	over 13 cm	3 guys

8.3.8.2 All tree support methods shall be such that they do not damage the tree.

8.3.8.3 Tree stakes and tree guys should remain for a maximum of 2 years.

9. MULCHING

9.1 GENERAL

9.2 PRODUCTS

9.2.1 Bark Mulch

Bark mulch shall be 25 mm (1") and minus Douglas Fir or Hemlock bark chips and fines, free of chunks and sticks, dark brown in colour, and free of all soil, stones, roots or other extraneous matter, and free of weed seeds and spores.

9.3 EXECUTION

9.3.1 Applying Bark Mulch

After finish grading is complete and immediately after each area requiring bark mulch is planted, place bark mulch in an even layer. Depth of bark mulch shall be 2" after settling.

10.1.6 Protection of Waterproofing

All slab areas to receive growing medium shall have an impermeable surface/waterproof membrane with a protective cover (protection board).

10.1.7 Drainage

All soil areas on slab shall be adequately drained by the following methods:

- (a) Drain rock layer, minimum 100 mm depth (4") immediately over the protective cover and separated from the growing medium with a filter fabric/membrane. (Refer to Section 5, Drainage, this Standard.)
- (b) Deck drains/planter drains where required to collect excess water. Drains shall be adequately protected to prevent soil particles from entering drain. Slab shall have a sufficient slope to ensure runoff to drain. Planter drains shall be located beneath the growing medium areas.
- (c) Deck drains may not be required immediately beneath the growing medium as noted in (iii) above, provided that the excess water collected in the drainage layer beneath the growing medium is directed to flow out of the soil area to deck drains located outside the soil area.

10.1.8 Watering

Due to rapid drainage in the growing medium, absence of a water table, finite amount of soil, and exposure to the climatic conditions, soil areas on slab will require more frequent watering than at ground level. It is recommended that a water supply be conveniently located near all planting areas or an irrigation system be installed.

11. ESTABLISHMENT MAINTENANCE

11.1 GENERAL

11.1.1 Intent

The intent of establishment maintenance is to provide sufficient care to newly installed plant material for a relatively short period of time to ensure or increase the long-term success of the planting. The objective is the adaptation of plants to a new site in order to obtain the desired effect from the planting while reducing the rate of failure and unnecessary work associated with improper establishment. Establishment maintenance procedures apply to all vegetation, including:

- cultivated turfgrass
- revegetated grass and wildflowers
- existing and new trees and shrubs.

11.1.2 Maintenance/Guaranty

Establishment maintenance procedures should be applied to all areas of planting that have not completed two growing seasons since installation. Maintenance during the one-year guaranty period is essential to the validity of ~~the~~ ^{ensure} guaranty (see Administration, 1.1.6 Bonding - Administration of Guaranty). ^{my}

11.1.3 Related Standards and Legislation

Canadian Fertilizer Code

11.1.4 Inspections

In addition to the inspection at the end of the guaranty period, there should be three other inspections during each growing ^{season} period attended by the Contractor and a designated representative of the Owner. A log book and reporting procedures as recommended in Administration 1.1.6 should be maintained.

11.1.5 Scheduling

^{is a predetermined}
Scheduled ~~the~~ maintenance operations shall be carried out as scheduled within the growing season between March 1 and November 30.

11.2 PRODUCTS

11.2.1 Products and materials shall be as specified in other parts of this Standard for landscape installation, ~~and in addition:~~))

11.2.2 Fertilizers shall be to the requirements of 6.2.8, and shall be 3-15-6 for the fall application to lawns, 18-6-12 for other applications to lawns, and 12-4-8 or 10-6-4 for ground-covers.

and shall be to the requirements of Soil Testing

11.3 EXECUTION

11.3.1 Plant Material Establishment

11.3.1.1 Watering

During the first growing season, new plants shall be watered at least every ten (10) days growing between April 1 and July 31, and every twenty (20) days between August 1 and September 15.

During the second growing season, new plants shall be watered at least every twenty (20) days between April 1 and July 31 and once between August 1 and September 15.

Watering shall be such that the water penetrates the full depth of the growing medium.

Soil moisture shall be monitored during the growing season, and watering shall be done more frequently when plants are reaching the permanent wilting point. Scheduled applications of water shall be missed only when rainfall has penetrated the soil fully as required.

11.3.1.2 Mulch

Mulches shall be maintained in the original areas and to the original depths.

11.3.1.3 Weed Control

All areas shall have all weeds removed at least once per month during the growing season by hoeing or cultivation to a maximum depth of 80 mm, hand-pulling, or, if necessary, by the use of herbicides.

11.3.1.4 Pest and Disease Control

All planted areas shall be inspected for pests and diseases periodically and at least every two months during the growing season. Treatment for pests or diseases shall be carried out promptly and consistently for maximum effectiveness,

11.3.1.5 Tree Support

Stakes, guy wires and ties shall be maintained for two full growing seasons. Ties shall be checked at least every four months to ensure that they are not causing a depression in the bark, and shall be

loosened, repaired or replaced as necessary. All stakes, guy wires and ties shall be removed after the second growing season except where large trees require continuing support.

11.3.1.6 Pruning

All trees and shrubs shall be inspected at least every two months during the growing season and shall be pruned to remove all dead, weak or diseased wood. Clipping or shaping shall be carried out only if required in the maintenance contract for specific varieties or conditions.

11.3.1.7 Fertilizing

Shrubs and trees shall be fertilized only as required to correct symptoms of nutrient deficiency. Ground covers shall be fertilized each spring by a uniform application of 10-6-4 or 12-4-8 granular fertilizer in early spring at the manufacturer's recommended rate, followed by thorough watering.

11.3.1.8 Liming

The growing medium shall be tested for pH at the beginning of each growing season and, if necessary to bring the pH within the range set out in Table 4, dolomite lime shall be applied at the rate of 4.5 kg per 10 m² (10 lb. per 100 sq. ft.) of soil surface.

11.3.2 Establishment Maintenance of Grass Areas

11.3.2.1 Watering

Hoses and sprinklers, irrigation systems or other methods shall be used to apply water to Class 1 and Class 2 grassed areas such that the grass is maintained in a turgid condition.

The method of application shall be such that packing or erosion of the soil does not occur. Watering is not required in Class 3 areas.

Each application of water shall be of an application rate and duration such that the water content in the growing medium reaches field capacity to the full depth of the growing medium. The next application shall take place when the water content reaches 25% of field capacity.

11.3.2.2 Weed, Insect and Disease Control

Grass areas shall be inspected each time they are mowed for weeds, insect pests, and diseases, and shall be promptly treated when necessary by appropriate manual methods, or by the use of chemicals in compliance with this Standard.

Broadleafed weeds shall be killed in Class 1 and 2 lawns by a general application of a suitable herbicide, if the weed population exceeds 10 broadleaf weeds or 50 annual weeds or weedy grasses per 40 square metres. This application shall reduce the weed population to zero.

11.3.2.3 Fertilizing

In April and in July, at least three months after seeding or sodding, 18-6-12 sulfur-coated urea fertilizer shall be applied to all lawn and grass areas at the rate of 1 kg per 40 m² of grass. In October, at least three months after seeding or sodding, 3-15-6 fertilizer shall be applied to all lawn and grass areas. Fertilizers shall be thoroughly watered in after application.

11.3.2.4 Liming

In November or March before each growing season, dolomite lime shall be applied over all grass areas at a uniform rate of 16 kg per 100 m² (40 lb. per 1,000 sq. ft.), or as recommended by a soil testing laboratory on the basis of samples taken from the grass area.

11.3.2.5 Mowing and Trimming

- i) All areas: The first four cuts shall be by a sharp rotary type mower. Excess grass clippings shall be removed after each cut.
- ii) Class 1 areas: Mow with a sharp reel or rotary mower when the grass reaches a height of 60 mm. Mow to a height of 40 mm. Trim with nylon line type power trimmer.
- iii) Class 2 areas: Mow with a reel or rotary mower when the grass reaches a height of 60 mm. Mow to a height of 40 mm. Trim with nylon line type power trimmer.
- iv) Class 3 areas: Mow every 30 days or as otherwise required. No edging or trimming is required.

11.3.2.6 Edging

Class 1 and 2 areas shall be edged with a half-moon or power edger once per year in March.

11.3.2.7 Aeration

Aeration shall not be carried out in the first growing season. If necessary in the second growing season, aeration shall be done in early May with a suitable mechanical corer. Coring shall be done to a depth of 100 mm, and the cores shall be broken up on the surface by the use of a diamond wire or wood drag.

11.3.2.8 Repairs

Regrading, reseeding or resodding shall be carried out when necessary to restore damaged or failing grass areas.

New sod or seed shall match the grass varieties in the surrounding area.

Resodding may be carried out throughout the growing season. Reseeding should be carried out between April 1 and April 15 or between September 1 and September 15.

Reseeded areas shall be protected and kept moist until the first mowing.

