Specifying Standards

by

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A Practicum submitted to the Faculty of Graduate Studies of

The University of Manitoba

in partial fulfilment of the requirements of the degree of

MASTER OF LANDSCAPE ARCHITECTURE

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Winnipeg

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A Landscape Architecture Design Practicum

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ABSTRACT

This practicum explored the requirements necessary for the creation of a national standard of plants and living materials. It defines the types of language and documents that are used in the communication between landscape architects, contractors and living material producers/providers. It defines the practical applications of standards in the landscape industry and outlines the process in which two governing organizations worked together to create a national standard with the inclusion of regional supplements. It then outlines the issues surrounding regional specific appendices and provides a local (Manitoba) alternative to the Container Grown Plants section of the National Landscape Standard.

ACKNOWLEDGMENTS

To Bob Somers for trusting me from afar, but for being right there when I had questions or concerns. Thank you for giving the entire document structure in the eleventh hour - whether you knew it or not. Your ability to capture the entire essence of years of work in five minutes of discussion amazes me. You always manage to say what I am thinking whenever I am unable to.

To Dr. Philip Ronald for coming in at the last minute, jumping right into the project, and for providing guidance and direction that was invaluable. Thank you for asking all the right questions and providing your encouragement and enthusiasm for the project.

To Dr. Alan Tate: Thank you for your patience, your wisdom, your incredibly clear guidance and direction, your patience and understanding, your availability for discussion and (always) last minute disaster aversion, your trust and encouragement, and your unending patience. Thank you for allowing me the opportunity to create my own path through this program, for being a part of it all, and of course, for your incredible patience with both me and this process.

To the Manitoba Association of Landscape Architects (MALA) and its council over the last six years: Thank you for all the opportunities you have provided me, and for continuing to encourage me to follow my interests and trusting me to contribute to so many of your projects and initiatives.

And finally, to my parents. Thank you for never actually asking me, "What are you still doing there?"

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INTRODUCTION

In any industry, a common language is used to communicate effectively between multiple user groups. In design, a common language is used to communicate instructions and directives between designers, material or product manufacturers, and the builders or contractors. Communication languages come in many different forms, and even though they may strive to do the same thing, these forms of language convey very different instructions.

Currently, in the profession of landscape architecture, particular methods of instruction are used, but are they best suited to communicate the intricacies of plant life? What if the current methods of communication used were not best suited to a living material? Do the types of language that discuss the use of a manufactured product in a construction process still maintain their integrity when applied to a growing, evolving and flexible medium?

It was these questions that prompted an exploration into the language of industry communication and transparency. The goal was to provide the Manitoba Association of Landscape Architects with a province-specific landscape standard document that would be used to ensure continuity, communication and clarification of requirements of living material used in landscape architecture projects within the province of Manitoba. This was to be modelled after the highly-successful British Columbia Landscape Standard produced by the BC Society of Landscape Architects (BCSLA) in partnership with the BC Landscape Nursery Association (BCLNA).

The first part of this practicum will aim to define all the methods of language used within the industry to communicate intentions, structure, detail and procedures. It will look at instruction produced at the highest levels of government, at documents created by national product regulating committees, and at manufacturers' product instructions. It will illuminate the ideal criteria with which an industry body should proceed in the creation of a standardized language for living materials, by discussing difference between specifications and standards.

INTRODUCTION

Secondly, it will formally document the process in which two large professional bodies, the Canadian Society of Landscape Architects (CSLA) and the Canadian Nursery Landscape Association (CNLA) approached the BC Landscape Standard in order to amend it to apply to a national audience. It will discuss the downfalls of national standards and what happens when the standards fail to do what they were intended to do, and the liabilities on the organizations who produce the work. It will outline benefits of national standards as well as discuss some of the issues related to regional differences as they relates to climate and growing conditions.

The last part will take what was learned about the process of the National Landscape Standards Committee and use that as a basis for altering a section the BC Landscape Standard to apply specifically to Manitoba's environmental variations.
Using both the National Standard and the regional supplement as a communication bridge between the principal participants in the landscape industry, will provide the basis for the body of documentation that is used, referenced, and updated. This seeks to demonstrate its capacity to become a living document.

CHAPTER TWO

GLOSSARY OF TERMS

INTRODUCTION

This chapter is an expansion on a paper that was written in May 2015 to satisfy the requirements for the course LARC7120 - Special Topics in Landscape Architecture with Dr. Alan Tate. The original document was titled Standards and Allied Documents for LA Practice and compiled a glossary of terms for document-writing in the profession of Landscape Architecture. These terms were then defined by industry recognized materials such as those written by The Construction Specifications Institute (CSI), the Canadian Standards Association (CSA), and by recognized and reputable business dictionaries such as the Blacks Law Dictionary.

The following text includes the original essay's terms and descriptions, but then expands on those definitions in order to identify the appropriate format for the creation of a document designed to assist in communication between Landscape Architects, contractors and nurseries within Manitoba. These explanations will attempt to directly relate the documents to each other, situate themselves within a construction documentation package, as well as outline some of the benefits and issues of using one form of documentation over another. While some terms are more straightforward and easy to define, others require additional supporting terms to be explored. As such, additional information, such as the proper processes to create certain types of documentation, are included where necessary.

TERMINOLOGY

*All quotes indicated were arranged and prepared in May 2015 as a requirement for LARC7120 - Special Topics in Landscape Architecture. They were presented in the form of an essay entitled Standards and Allied Documents for LA Practice. The purpose of this chapter is to further that body of work and expand on the original essay. No other parts of the original essay have been used without credit.

Definitions act to assist in explaining what types of information are included in each type of document. It also helps to define what types of information are not included and how the document changes name as well as role when certain information is applied. The main focus of this chapter will be on two definitions: Specifications and Standards. Exploration of these two sets of documents will be expansive and will include supporting definitions for subset documents under each heading. But first, it is necessary to explore other widely-used documents in the practice of Landscape Architecture to gather an understanding of how each type functions in relation to specifications and standards, such as by laws, guidelines, best practices, project manuals, and drawings.

By Laws (bylaw, byelaw, by-law)

*"A rule that an organization (such as a club or company) makes and that its members must follow; A law or regulation that is made by a local government and that applies only to the local area" (by law, Merriam-Webster, n.d.).**

BY LAWS

A by law is a "rule or law of a corporation [or government] and is a legislative act" (by law, Black's Law Dictionary, n.d.). By laws are not 'laws' in that they are not passed by a national/federal body, but instead are made by a local/municipal/ corporate government that derives its authority from a higher source of power. By laws are passed on a limited range of matters specified by the sovereign body but regulated by the local government. In other words, a local government will gain its power through a form of delegated legislation. The power or weight of the by laws themselves are generally protected by the national/ federal dictation of authority to the local body of government.

By laws generally are not amended or changed regularly as they require a significant majority of an organization or government to agree upon the changes. They tend to provide the basis upon which policies and guidelines are created (Community Sector Council Newfoundland and Labrador, n.d.).

For example, the British Columbia Society of Landscape Architects (BCSLA) has written a set by laws (adopted April 24, 2010) that govern their landscape architect members' "duties to the public, duties to the client, duties to the environment and duties to the profession" (BCSLA Bylaws, 2010). In this by law document, only two paragraphs are dedicated to instruction on proper environmental care. While advising Landscape Architects on the importance of "better integrat[ing] built and natural environments" as well as "the application of human and natural ecology […] for the long-term health of the natural environment," (BCSLA Bylaws, 2010, p. 4) the by laws fail to indicate how practising Landscape Architects are to achieve such goals.

BY LAWS

The by laws in this example act as a mission statement for each project, but do not communicate the means by which to reach the goal. A more comprehensive account is necessary by which each material (in our case these materials are living elements) should be managed in order to produce the desired effect.

Guidelines

"An indication or outline of policy or conduct" (guideline, Merriam-Webster, n.d.).

"A statement or other indication of policy or procedure by which to determine a course of action" (guideline, American Heritage Dictionary of the English Language, n.d.).

"A principle put forward to set standards or determine a course of action" (guideline, Collins English Dictionary, n.d.).

*"Any guide or indication of a future course of action" (guideline, Random house Kernerman Webster's College Dictionary, n.d.).**

GUIDELINES

Guidelines are documents put in place as a suggestion of actions to make outcomes more predictable and possibly of a higher quality. It is a view into the future, or a way of predicting an outcome and ensuring that if the process were to be repeated, similar outcomes would be likely to occur. One of the key terms in each of the definitions is 'indication' which suggests that rules are not finite and are open to change. Guidelines are generally administered by a corporation or committee interested in preserving the continuity or longevity of a set topic. "A guideline aims to streamline particular processes according to a set routine or sound practice" (United States Department of Veterans Affairs, 2015).

One of the disadvantages in relation to our use of the word comes from Black's Law Dictionary in which guideline is defined as "a practice that allows leeway in its interpretation…" (guideline, Black's Law Dictionary, n.d.). While the main suggestion of the guideline may be followed, additional variables may be added into the interpretation without jeopardizing the integrity or quality of the work. Discrepancies arise when these interpretations are left up to the user to determine.

Another disadvantage occurs when attempting to enforce such an open document. According to the definition provided by the US Department of Veterans Affairs, "following a guideline is never mandatory. Guidelines are not binding and are not enforced" (United States Department of Veterans Affairs, 2015). Enforcement of such a non-legally binding suggestion is difficult, if not completely impossible.

Best Practice

"A procedure or set of procedures that is preferred or considered standard within an organization, industry, etc." (best practice, Dictionary.com Unabridged, n.d.).

*"The way that shows results every time. Its the benchmark" (best practice, Black's Law Dictionary, n.d.).**

BEST PRACTICE

Best practice is considered to be the superior way to achieve a desired outcome based on efficiency and consistency and it is generally derived from previous experiences or lessons in practice. Similar to guidelines, it strives to predict the outcome. However, unlike guidelines, the goal of a best practice method or technique is not only to create a high quality outcome, but also to create the highest quality possible. Best practice is used in place of any mandatory legislated standard as it generally dictates practice of a higher caliber than that required by the standard requirements.

BEST PRACTICE

Best practice techniques generally include an element of "incentive, or reward that is believed to be more effective at delivering a particular outcome than any other technique," (United States Department of Veterans Affairs, 2015) and is therefore self-assessed and not regulated by any outside governing body.

BEST PRACTICE

One of the disadvantages to a best practice approach is that the techniques are generally based on "repeatable procedures that have proven themselves over time for large numbers of people" (United States Department of Veterans Affairs, 2015). Time and consistency of application are necessary and do not offer opportunities for unique variables to alter the outcome. In certain circumstances, a best practice approach would be limited in its adaptability to the environment and may not produce the desired result.

Policy

"A plan or course of action, as of a government, political party, or business, intended to influence and determine decisions, actions, and other matters

A course of action, guiding principle, or procedure considered expedient, prudent, or advantageous" *(policy, American Heritage Dictionary of the English Language, n.d.).*

"A document embodying a contract of insurance" *(policy, Random House Kernerman Webster's College Dictionary, n.d.).**

POLICY

While by laws define a required end goal, policies differ from by laws by prescribing an appropriate action to take in varying situations (Community Sector Council Newfoundland and Labrador, n.d.). While by laws are a more concretely prescribed and governed (see definition of 'By law'), policy gives the adoptee more flexibility and opportunity to make amendments to written directives as situations evolve. Policy assists in directing officials with an educated course of action for both subjective and objective situations. Policies tend to be neutral in protecting opposing parties and instead act as a moral or ethical guideline to navigate appropriately through sensitive situations.

The term policy involves the implied mandatory acceptance and adoption of rules. These rules or principles are to act as a guide towards achieving rational outcomes. However, the word 'policy' closely relates to the word 'politics' and there can sometimes be a sense of uneasiness that surrounds the word. The American Heritage Dictionary of the English Language uses the term 'prudent' (policy, n.d) to define policy, which confirms that a shroud of discreetness or circumspection surrounds the policy writing process. Unfortunately this perception is not factual, and instead policy tends to protect both parties equally.

Building Codes

"Building codes are minimum requirements for design and construction of new or remodelled structures, with an emphasis on buildings. Design documents must demonstrate compliance with those requirements" (The CSI Glossary, 2010, p. 5).

*"Set of standards established and enforced by local government for the structural safety of buildings" (building codes, Black's Law Dictionary, n.d.).**

BUILDING CODES

While the term ‘code’ is the relevant component of this document, ‘building codes’ is more of a relevant term to the construction of landscape architecture. Code refers to a set of standards followed or adopted to ensure public safety. These standards cover broad topics relevant to building or construction and are generally policed by local governments. Codes are also a means by which safety inspectors can regulate approved minimum safety requirements.

These sets of standards focus their attention on public health, safety and the general welfare of the population, or in other words they protect the users of the space. They do not ensure proper use of materials or procedures for installation that would contribute to the longevity of the project. They are not an approved method for application, but rather an insurance that injury is less likely to occur in spaces that have followed code requirements.

Project Manual

*"An assemblage of documents related to the construction work on a project, typically including bidding requirements, sample documents, conditions of the contract, and specifications" (project manual, McGraw-Hill Dictionary of Architecture and Construction, n.d.)**

PROJECT MANUAL

A project manual is a "bound volume or set of volumes that contains the written portion of […] construction contract documents" (Rosen, 2010, p. 25). It was developed by an American Institute of Architects (AIA) national Committee on Specifications as a response to the growing number of documents that were included in the "Specifications" that went beyond what the specification documents were meant to (Rosen, 2010, p. 25). The project manual concept is to include (but is not limited to) contracting forms, conditions of the contract, drawings, procurement requirements, and specifications (The CSI Glossary, 2010, p. 41) and is organized according to MasterFormat (see MasterFormat) (Rosen, 2010, p. 25). These documents are usually prepared by the owner, the owner's legal counsel, and insurance adviser (The CSI, 2011, p. 1) to ensure proper wording and prevent future liability issues.

Drawings

"A special language or means of communication to convey ideas of construction from one person to another" (Rosen, 2010, p. 6).

"Drawings present a picture or series of pictures of a project or parts of a project to be constructed" (Rosen, 2010, p. 6).

*"The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams" (Rosen, 2010, p. 5).**

DRAWINGS

The inclusion of 'drawing' in this document is to highlight the differences between drawings and specifications (see Specifications and Project Manual). Each form of communication has a unique role for a complete and concise understanding of any project. Drawings are a graphical language that conveys ideas not effectively communicated by words, including "the size, form, location, and arrangement of various elements of the project" (Rosen, 2010, p. 5). Notes should be reduced on the drawings whenever necessary and instead that information should be included in the specifications (Jones, 1971, p. 172). Generally speaking, drawings are part of the Project Manual that shows the sites and locations of constructed objects, while specifications address the qualities and processes by which such construction should be carried out.

Drawings are to complement the specifications, however information should not be repeated on both forms of communication to avoid errors when making amendments to documents. In order to prevent duplicate information, it is important to not describe details in the specifications that are best shown graphically on the drawings (Rosen, 2010, p.5).

Specifications

"An act of specifying or making a detailed statement, or the statement so made; a definite or formal mention of particulars: as, a specification of one's requirements" (Jones, 1971, p. 162).

"Specification is a precise statement describing the characteristics of a particular item" (The CSI Glossary, 2010, p. 49).

"Specifications define the quality requirements for products, materials, and workmanship upon which the contract is based and requirements for administration and performance of the project. They are generally written for each subject upon which the project is based" (The CSI Glossary, 2010, p. 49).

"Specifications, in general, can include various types of data; however, the specifications included as a part of the contract documents are the written description of the work to be performed by the contractor and are prepared by the [architect or engineer]" (The CSI Glossary, 2010, p. 49).

*"A specification is a verbal or written statement of the characteristics of a thing. The statement whether a short definition, or a comprehensive description or a complete theory, provides a particular and detailed account, which is accurate, clear and unambiguous; keeping strictly to the subject, and having no superfluous information" (Martin, 1971, p. 37).**

SPECIFICATIONS

When relating documents of standard procedures to the profession of Landscape Architecture, we find that one of the ways to effectively communicate our ideas to those who build them is through the use of Specifications. "Specifications are essential for complete understanding of the work to be performed by the contractor" (Rosen, 2010, p. 3). They form a vital part of the contract documents or Project Manual.

Specifications describe the type and quality of every product in the work to be produced, "from the simplest material through [to] the function [of the] system" (Rosen, 2010, p. 8). They have an emphasis on quality through all aspects of the work starting from the manufacturing process, through to the application and installation as well as finishing and adjusting. Quality is not the only thing the specifications dictate. They also describe, in detail, all of the requirements necessary to fabricate, erect and install each product and by each defined method, including overall component dimensions for specified materials, manufactured products,

and equipment. They even outline procedures for product alternates and options should the requested products or methods not be available (Rosen, 2010, p. 8). "In all cases, a specification conveys information" (Martin, 1971, p. 37).

Specifications are not limited to the materials and construction processes. They also outline any regulatory requirements (including codes and standards) that are applicable to the work. When it comes to bidding, specifications describe the procedures for allowances and unit prices within the contract, and directions for tendering on the project. They also describe the requirements for administration of the contract as well as the legal implications of the construction procedure (Rosen, 2010, p. 8; Jones, 1971, p. 163).

Specifications work best in tandem with drawings (see Drawings), however it is important to note that "there is a tendency in a dispute to give greater significance to the specifications than to the drawings" (Rosen, 2010, p. 3).

SPECIFICATIONS

Besides showing different information than that which is present on the drawings, specifications actually govern the differences between the drawings and specifications (Jones, 1971, p. 172). Drawings describe a particular set of details and this information should not be repeated in the specifications, unless duplicating verbatim. Failure in doing so can lead to contradiction, confusion, misunderstanding, and difference of opinion (Rosen, 2010, p. 8).

While drawings show geographical information, specifications should instead cover information on workmanship and installation. Details such as brand names of materials or connections should be present in the specifications and not on the drawings. Even cross hatching on drawings may be eliminated by a complete and detailed specification. Including all the proprietary and performance information in the specifications reduces the amount of work involved in changes and almost completely eliminates drawing changes post design (Jones, 1971, p. 172).

One important thing to note, however, is that although the drawings and specifications show different types of information, it is not unusual for illustrations to be present within the specifications. "[O]ne illustration may help to minimize extensive descriptions and prevent misunderstanding[s]" (The CSI, 2011, p. 18). These illustrations do not always have to take the form of a drawing, but rather they may be graphics or photographs provided by the material supplier. In order to ensure that the correct information is being portrayed, text should always accompany the graphics clarifying the illustrations' status within the documents (The CSI, 2011, p. 18).

SPECIFICATIONS

The types of specification relevant to professional work have changed over the years. In 1971 the four main types of specifications were Outline Specifications, Base Bid Specifications, Prescription Specifications, Performance Specifications (Jones, 1971). These types of specifications lend themselves more towards a manual drawing approach. More recently, the four major types of specifications include Descriptive Specifications, Proprietary Specifications, Performance Specifications, Reference Specifications (The CSI, 2011), which cater towards the efficiency of project design that has developed in conjunction with design technology.

THE BASIS FOR WRITING SPECIFICATIONS

Specification (or standards) writing is simultaneously an art form as well as an exact science. The fluid nature in which information must travel seamlessly between specifications and drawings can be compared to the most beautiful dances in which the dancers must be acutely aware of each other to be able to perform meticulous maneuvers. Repetition is discouraged as variation of wording may be interpreted differently (Jones, 1971, p. 164), leaving the outcome open to interpretation. In addition, human error may occur when making amendments to future documents and repeated specifications may not all be changed accordingly.

Specification writing, as clearly outlined throughout this document, must also be exact in its wording. It may act as a legally binding document which contractors are to abide by, therefore any form of wording that can be interpreted in multiple ways is discouraged. The overall goal is to "relay a message to the persons who will have the responsibility of building the project with which you are concerned, so you must phrase your requirements clearly and simply" (Jones, 1971, p. 164). Terms and symbols may be introduced into specifications and drawings, provided there is an agreement between the writer and the contractor to their interpretation (Martin, 1971, p. 37).

The Construction Specifications Institute outlines a method they call the Four C's for writing specifications as defined below:

"The four Cs for effective communication are: CLEAR, Use proper grammar and simple sentence construction to avoid ambiguity; CONCISE, Eliminate unnecessary words, but not at the expense of clarity, correctness, or completeness; CORRECT, Present information accurately and precisely. Carefully select words that convey exact meanings; COMPLETE, Do not leave out important information."
(The CSI Glossary, 2010, p. 25)

Specifications may be produced in numerous ways depending on the resources available within the organizations producing the documents. In small firms, a principal may assume the responsibility while medium size firms (of about 20 - 70 people) may employ a dedicated specification writer. In larger organizations, an entire department may be dedicated exclusively to specification writing and maintenance. In other cases, independent consulting services may be hired to provide specifications (The CSI, 2011, p. 1). In all instances, specification writing is an important and integral part of any project and must be viewed as such.

SPECIFICATION STRUCTURE

There are many ways in which specifications may be structured, and each specification writer may have a different way of organizing their own in-house specifications. Attempts have been made, however, to standardize the way specifications are written. One of the most successful and widely adopted formats is MasterFormat. The other is SectionFormat

MasterFormat

MasterFormat is a structural organization jointly developed by Construction Specifications Institute (CSI), a US organization, and Construction Specifications Canada (CSC) as a way of providing organization to specification writing through an agreed upon numbering and title system. This system accounts for a "variety of subject matter necessary for the construction, operation, and maintenance of a facility" (The CSI Glossary, 2010, p. 31). Items are organized by a six-digit and eight-digit numbering system that conforms all information into a standard order or sequence. The organizational system caters to all forms of construction specifications and building requirements.

One of the advantages to standardizing the presentation of specifications is to improve communication between the writing and receiving parties. Time savings for specification writers is invaluable to a project, and the possibility for information to be missed by a contractor is greatly reduced (The CSI, 2011, p. 31).

Most of the specifications relevant to the work of landscape architects can be found in the Site and Infrastructure Subgroup, which runs from Division 30 to Division 39, and are organized as follows:

• **Division 30** - RESERVED FOR FUTURE EXPANSION

• **Division 31** - Earthwork (including Site Clearing, Earth Moving, etc.)

• **Division 32** - Exterior Improvements (including Asphalt Paving, Concrete Paving, Unit Paving, Pavement Markings, Playground Protective Surfacing, Chain Link Fences and Gates, Soil Preparation, Turf and Grasses, Plants, etc.)

• **Division 33** - Utilities (including Store Utility Drainage Piping, Subdrainage, Pond and Reservoir Liners, etc.)

• **Division 34** - Transportation

• **Division 35** - Waterway and Marine works

• **Division 36** - RESERVED FOR FUTURE EXPANSION

• **Division 37** - RESERVED FOR FUTURE EXPANSION

• **Division 39** - RESERVED FOR FUTURE EXPANSION

(ARCOM, 2015)

SPECIFICATION STRUCTURE

SectionFormat

In addition to MasterFormat, SectionFormat is an ordering system created to extend the MasterFormat organizational method. Within each MasterFormat section, the specifications are divided into three parts; general, products, and execution (The CSI, 2011, p. 48). The benefit to organizing parts consistently within each section is to facilitate placement and retrieval of information (The CSI, 2011, p. 31).

TYPES OF SPECIFICATIONS

Project specifications typically employ more than one specifying method, and there is no clear rule for using more than one method (The CSI, 2011, p. 45). Under the heading of specifications, there are nine specific well known types. These include:

- Proprietary;
- Performance;
- Descriptive;
- Outline;
- Guide;
- Manufacturer's Instruction;
- Master or Master Guide Specifications;
- Shortform; and
- Reference Standards.

Proprietary Specifications

Proprietary specifications are used to describe the exact materials or products by "manufacturer's name, brand name, model number, type designation, or other unique characteristics" (The CSI Glossary, 2010, p. 43). In some cases a manufacturer's name may not be specified. This is still considered to be a proprietary specification if the material or product is only available from one source (The CSI, 2011, p. 53).

PROPRIETARY SPECIFICATIONS

Some of the advantages of proprietary specifications include: the ability to control product selection and therefore the quality of the material; the readily available details obtained from the selected manufacturers database (see Guide Specification); and the ability to prepare more detailed and concise drawings resulting in reduced time costs (The CSI, 2011, p. 53).

While bidding on a project may be simplified by the use of proprietary specifications by removing product pricing as a variable, one disadvantage to this method is the reduction (or complete elimination) of competition for products, which results in government bodies not allowing proprietary specifications for use on public projects. Additional disadvantages include: products selected which the contractor has little, none, or even an unfavourable experience; and the possibility that certain products and manufacturers may be favoured over others (The CSI, 2011, p. 53). Another disadvantage is the possibility for errors to occur during the specifying of model or product designations. One way to avoid such errors is to provide open proprietary specifications rather than closed proprietary specifications. While Closed Proprietary Specifications do not allow for substitutions of materials or products (The CSI Glossary, 2010, p. 8), Open Proprietary Specifications allow for variances by the contractor for alternative products (The CSI Glossary, 2010, p. 33).

Performance Specifications

Performance specifications are written to provide a "statement of required [end] results with criteria for verifying compliance, but without unnecessary limitations on the methods for achieving the required results" (The CSI Glossary, 2010, p. 17). In other words, performance specifications dictate the end result clearly as well as the method by which the product or system will be assessed to ensure proper installation. Material and process descriptions are kept to a minimum. Measurement and testing for compliance with end criteria may be done at various stages in the construction/installation process including "before production, at the time of production, in place at the site, or after a period of service" (The CSI, 2011, p. 47).

PERFORMANCE SPECIFICATIONS

The flexibility of performance specifications is extensive for both the design team as well as the contractor. Performance specifications may be written exclusively for a single attribute of a project, or they may extend to cover the entire project (The CSI, 2011, p. 37). The contractor then has the ability to choose materials and methods as long as they comply with the performance criteria. In order to retain this flexibility for both parties, it is important to note that only essential restrictions should be placed on the system or process of installation (The CSI, 2011, p. 47).

One of the advantages to a performance specification is that it encourages the use of "innovative construction techniques" (The CSI, 2011, p. 37). It is up to the contractor to devise new means of achieving desired results without having explicit instructions provided. An outcome of this method would be its favouritism towards the use of local construction methods.

Another advantage is that it relieves some of the pressure of the design team to research and identify the best means by which to prepare the site for installation, as well as the proper methods by which to achieve the desired result.

A disadvantage to this type of specification writing is that it can be subjective in nature. It is difficult to use performance specifications in situations where there are no measurable properties by which to assess the requirements of the final outcome.

PERFORMANCE SPECIFICATIONS

The end results must be clearly identified and an "incomplete performance specification [may] result [..] in a major loss of quality control over the materials, equipment, and workmanship going into a project" (The CSI, 2011, p. 46). Criteria for verification must be "capable of measurement, test, evaluation, or other acceptable assurances (The CSI, 2011, p. 47).

According to The Construction Specifications Institute, various codes and standards are moving towards more use of performance specifications (The CSI, 2011, p. 37).

Descriptive Specifications

Descriptive specifications are written to reveal the exact properties of materials, including a description of characteristics and physical properties, as well as the methods by which proper installation is to occur (The CSI Glossary, 2010, p. 18). Proprietary, or manufacturers' trade names (Rosen, 2010, p. 47) are withheld from these documents allowing those decisions to be made by the contractor or those providing installation services.

In some instances, the use of proprietary names may be prohibited by law, as such can be the case for (but not limited to) large public projects. In these instances, where proper reference standards do not exist (see Reference Standard), "a descriptive specification may be the only logical choice" (The CSI, 2011, p. 46). This method permits free competition between contractors by not requesting "specific products of specific manufacturers" (Rosen, 2010, p. 47).

Another advantage to descriptive specifications includes precisely indicating what the nature of the design requests. For example, exact dimensions and colours of concrete pavers may be specified, and the materials used must meet those requirements. These specifications can be applied to all conditions, methods, or situations of a project, or they may relate to only one section (Rosen, 2010, p. 47).

DESCRIPTIVE SPECIFICATIONS

Descriptive specifications are incredibly versatile. While they create a clear document that is a good basis for bidding, they are also widely comprehensive for the result of what the work shall be. They lend themselves towards both large and small scale projects, public and private projects, or for both complex and elaborate details as well as very simple designs (Rosen, 2010, p. 47), however, it must be noted that descriptive specifications tend to "bulk up" (Rosen, 2010, p. 48) the project manual and may not be an ideal method for certain small scale or simple designs.

While the advantages to descriptive specifications appear to be great, there are also numerous disadvantages, including demanding the Contract Administrator (CA) to have detailed technical knowledge and experience regarding the installation of the materials requested (The CSI, 2011, p. 45). Due to the additional demands of precise expertise, performance attributes of the materials and products become the liability of the landscape architect.

Subsequently, the process in which this method is carried out can tend to be a lengthy and tedious process (The CSI, 2011, p. 46), consuming project time and expenses.

Extra time and care is also required on site during construction when descriptive specifications are used. Quality assurance agents for both the owner and the contractor are recommended to monitor the products and procedures during various stages of the construction (Rosen, 2010, p. 48).

As in all specifications, "wordsmithing" is a requirement, but none more so than in descriptive specifications. They "require the specifier to take special care in describing the design intent in order to achieve the intended results" (Rosen, 2010, p. 48). The possibilities for misinterpretation of intentions can occur in more than one instance, however. The contractor may incorrectly interpret specifications and select incorrect products.

DESCRIPTIVE SPECIFICATIONS

On the other side, the designer may not property interpret the specifications when reviewing and evaluating products proposed by the contractor. This disadvantage is multiplied when it is not the specifier themselves who evaluates the product, but rather a construction contract administrator who "has not participated in making the design decisions and who does not know which described attributes are essential" (Rosen, 2010, p. 48). The creation of a clear and concise set of specifications is a practiced skill, and special care should be taken to ensure the intended results of the design are achieved.

According to The Construction Specifications Institute, with the increased complexity of projects as well as the wider availability and scope of reference standards, the descriptive method is being seen less frequently as a preferred method of specification writing (The CSI, 2011, p. 46, Rosen, 2010, p. 48).

Outline Specifications

The first stage in the development of a specification is to create the outline specification. These documents are a brief description of the main components to be used in construction, including the finishes, substructures, and plant material types (outline specifications, CIOB Designing Buildings Wiki, 2013). The outline specification is used during the design process as a means for "revising cost estimates, schedules and value analysis studies" (The CSI Glossary, 2010, p. 34) and to allow the cost consultant to prepare approximate quantities.

OUTLINE SPECIFICATIONS

One of the advantages to creating an outline specification is that it acts as a means of communication among members of the design team, creating continuity throughout the entirety of the project and acting as a checklist when selecting products and methods. They act as an internal policy, helping to "control the decision-making process and encourage clarity in the construction documents" (The CSI Glossary, 2010, p.34). Another advantage of outline specifications is to encourage decisions on materials and finishes at the beginning of the project, reducing the potential for major design changes at later stages, consequently making efficient use of design team time (The CSI Glossary, 2010, p. 34).

Guide Specifications

Guide specifications are proprietary specifications written by a product manufacturer to "relieve the [architect/engineer] from some of the tasks of researching and writing particular specification[s]" (The CSI Glossary, 2010, p. 26). This type of specification does not instruct the contractor as to the best installation method (see Manufacturer's Instruction). These are only pre-written specifications denoting the brand name, model number, or other proprietary information (see Proprietary Specification).

Manufacturer's Instruction

Unlike guide specifications, these types of specifications are manufacturer-prepared instructions on the appropriate application or installation on a product or material. The contractor and landscape architect can use this information to "verify that the project is ready for installation and that the installation follows the recommendations of the manufacturer" (The CSI Glossary, 2010, p. 30).

Master (Guide) Specifications

Master and Master Guide specifications are those which are used (generally in-house) as a reference for project specifications. Master Specifications are typically an entire document that is used as a guide for a project manual, while Master Guide Specifications are typically considered to be sections that are then edited and used for projects (The CSI Glossary, 2010, p. 30).

Shortform Specifications

Shortform specifications are exactly what their name suggests - a compact and easy-to-read document that communicates the project requirements in the shortest form possible. The language is concise and direct and they are an extremely cost-effective way of communicating design intentions (The CSI Glossary, p. 48).

Reference Standard Specifications

Reference standard specifications are written to refer to an industry-established standard for a particular product, material, or process (Rosen, 2010, p. 47) (see Reference Standard). They are not researched and written by a specification writer for each project, but rather the writer references pre-existing standards recognized by the industry as complete and exact. Reference standard specifications may amend the referenced standard, but they generally follow the specifications outlined by recognized associations of the industry.

Reference standard specifications are easy to implement within a project as they are widely known and accepted by both the contractor and owner. These types of specification also cite well known materials and processes that are recognized by members of the building community. It is rare for a reference standard to be written for an obscure material or method. Additionally, reference standard specification writing dramatically shortens the specifications within a project manual (Rosen, 2010, p. 49).

REFERENCE STANDARD SPECIFICATIONS

Some of the disadvantages to reference standard specifications happen when either duplicate instructions within a specification occur, or if a specification lacks adequate instruction after a reference material suggests multiple options (The CSI Glossary, 2010, p.45). In cases of unique or not commonly used products, there may not be an appropriate standard to reference, and therefore reference standard specifications are not an appropriate method (Rosen, 2010, p. 49).

It is important to ensure that all reference standards specified are as current and up to date as possible, and that the current version is still applicable. Some standards organizations do not update regularly to keep up with developing technology, and obsolescence may become a problem. It is also important to remember that reference standards are often written and promoted by members of industry associations, and distributed primarily for their own benefit. Therefore reference standard specifications require research and care in use (Rosen, 2010, p. 49).

In order to use reference standards properly in specifications, they should meet some basic criteria. The standards should be well recognized as the authoritative word in the industry and should be available to all parties that require the information.

The specifier should be knowledgeable of the standard they are using. By not fully understanding a reference standard, specifiers run the risk of creating a problematic specification. One problem can come from using information from a bad reference standard which immediately causes problems in the specification. Another problem can occur when standards refer to either a particular trade or a particular subcontractor, or then may even refer to other standards for testing and materials (Rosen, 2010, p. 50). All specification writers should take the time to read over all the information written in the standards referenced to ensure that conflicts and confusion do not result.

REFERENCE STANDARD SPECIFICATIONS

Reference standard specifications have two additional disadvantages that are similar to descriptive specifications (see Descriptive Specifications). Firstly, they may appear to be too elaborate for either simple or minor projects (Rosen, 2010, p. 49). Secondly, much like descriptive specifications, the possibilities for misinterpretation of intentions are greater than with other specifications. Rosen describes this as being similar to "playing a game," and offers us the quote to the found to the right, for clarification.

"…the design intent is encoded into an industry standard and then decoded by the Contractor for procurement. The Contractor must interpret the specifications to identify and procure complying products available in the marketplace. Information is submitted for review by the Architect/Engineer, who must evaluate whether anything has been lost in translation and determine that the proposed product complies with both the reference standard and the design intent" (Rosen, 2010, p. 49).

It is a good idea for the Contract Administrator to have copies of or access to the reference standards cited in the specifications. While it is generally impossible to maintain a (current) library of all reference standards, procuring current copies of the most commonly used reference standards is advisable (The CSI, 2011, p, 49).

Standards

"A standard may […] be defined as any single thing fixed by authority or agreement to serve as a level of excellence or as a symbol" (Martin, 1971, p. 33).

"A standard refers to one or more related specifications that have been sanctioned or recognized externally by standards development organizations, have been widely used and accepted by industry, have been mandated by government policy, or have been internally sanctioned or mandated for use […]. Standards may be expressed in a variety of ways, […] and may identify policies, guidelines, characteristics, constraints, and/or conformance criteria" (United States Department of Veterans Affairs, 2015).

*"A standard is typically developed according to a specified set of rules and procedures providing consensus amongst many parties and is published by a neutral party. While standards have different purposes, […] they are mostly used as a reference for design or product criteria" (BICSI, n.d.).**

STANDARDS

The term standard is used when an item is regarded as having a high grade or level of quality. It can also be used to describe something that has a widely ranging acceptance or recognition (Jones, 1971, p. 75). Standards are preferred methods of practice for products/processes. They are used as a guide when writing specification documents that involve particular design construction methods or products.

Standards may be used in one of two ways. The information contained within them may be used as the basis for writing specifications (see Accredited/ National Standards, Industry Standards and De facto Standards), or they may be used by reference within a set of specifications (see Reference Standards), and may require modification. Reference standards tend to be the preferred method as they are the expedited version and avoid duplication. In addition, reference standards are created by knowledgeable members of an organization or group and are therefore widely regarded as being complete and accurate (Jones, 1971, p. 76).

One advantage to using standards is that they are widely recognized and tend to go through rigorous testing before being implemented. When referencing a standard written by a product manufacturer, it is safe to say that satisfactory testing has occurred and that a product performs to the minimum requirements as outlined in the specified standard.

Opposite to this, one disadvantage to standards is the length of time it takes to create them (NPES, 2005). The investment of time and manpower to create such a document is extensive, and manufacturers and organizations must be willing to make significant investments to complete the work. It is generally recognized "that the length of time it takes to develop a standard is directly proportional to the technical manpower available to do the work" (NPES, 2005).

STANDARDS

While there are certainly advantages to using standards, one must be careful to follow certain rules in order to ensure the credibility and accuracy of the information provided. Firstly, it is not uncommon for some organizations to create a highly recognized standard and never revise it. This can cause certain standards to become out of date, especially if products or methods involved have been subjected to vast technological improvements. One example of this is sections of the Commercial Standards series produced by the United States Department of Commerce. These standards are written and then may become obsolete in the marketplace years later and subsequently never have updates done. Unfortunately, these standards are not pulled and can therefore appear in reference standard specifications years later (Jones, 1971, p. 77). Additionally, if a contractor is unable to obtain standards because they are no longer relevant, confusion or problems may arise.

Secondly, it is important for specification writers to be familiar with the standard they are using (Jones, 1971, p. 78). Some standards offer choices to the user, and if these are used within a specification without indicating which option is ideal, the contractor may take it upon themselves to make the selection.

The ability to incorporate standards properly is an important third rule (Jones, 1971, p. 78). If the standard being referenced has been subjected to revisions or updates, it is necessary to include (usually by a numbering system) the date of issue or revision number of the document being referred to.

In the case of American Society for Testing and Materials (ASTM) standards, the proper way to reference the material used is by "suffixing the last two digits of the year of issue of the standard to its number" (Jones, 1971, p. 78). For example the Standards Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System) was updated in 2011 and the new ASTM Standard would read D2487-11 (ASTM International, n.d.).

Similarily, when using Canada Standards Association (CSA) standards, the proper way of referencing is by suffixing the year of issue (Jones, 1971, p. 78). For example the standard for Managing chasing snow load risks for buildings in Canada's North (published in 2014) would be referred to as CAN/CSA-S502-14 (CSA Group, n.d.).

Alternatively, the Canadian Government Specifications Board (CGSB) standards require additional specification edits to "suffix a letter of the alphabet to indicate each subsequent edition after the first" (Jones, 1971, p. 78). For example, the CGSB standard for Vapour Barrier, Jacket and Facing Material for Pipe, Duct and Equipment Thermal Insulation has had one edition and would read as CGSB 51-GP-52Ma (Public Works and Government Services Canada, n.d.). Thankfully, with the increase of technology and ease of distribution, standards are updated and amended with increasing frequency.

Lastly, it is necessary to enforce the standards provided. While this is a difficult rule to follow, one suggestion may be to "avoid using standards which make demands which you [do not] really need, and which you have no intention of enforcing" (Jones, 1971, p. 79). By continuously incorporating standards that are extravagant and not enforced you "put the conscientious supplier, who attempts to meet your specification, at a disadvantage against the less scrupulous supplier who knows you don't enforce your standards" (Jones, 1971, p. 79).

TYPES OF STANDARDS

Various types of standards, all requiring various levels of scrutiny, are available. Some of the varying types are defined on the following pages, and include:

- Accredited/National Standards;
- Industry Standards;
- De facto Standards; and
- Reference Standards.

Accredited/National Standards

Accredited or National Standards, are those which are created under the guidelines of a national or international standards body and are subjected to an open consensus process. One of the benefits to such a thorough method is to ensure that all interested parties will have their concerns heard and addressed, resulting in a more clear, exact and reliable standard. Of course, this method is a slow process, resulting in organizations undertaking the revision-making process almost immediately after completion. Accredited or national standards tend to distinguish the difference between required elements that must be met to conform to the standard, and descriptive material which provides additional information but does not contain requirements. Accredited standards are publicly available through their publishing standard bodies, including the International Organization for Standardization (ISO), American National Standards Institute (ANSI), Standards Council of Canada (SCC), and the Canadian Standards Association (CSA) (NPES, 2005).

Industry Standards

Industry Standards vary only slightly from accredited or national standards. These are documents that take the form of formalized industry practices. They are developed by a group in the industry, but there are no requirements for the process to be open to any interested party for review or comment during the development process. This is not to say that these standards do not go through the same rigour as accredited standards, but they are not regulated the same way. As such, groups that write industry standards are not required to consider or respond to comments on the work, in some cases, making the standard less reliable. It is important to note, however, that industry standards are very often referenced in accredited standards, mainly due to the public availability of these documents (NEPS, 2005).

De facto Standards

De facto standards are a set of in-house specifications that gain credibility as the result of their use by a particular group of people. They are developed within a closed group and thus not open to the consensus process. Because the standards are developed by an independent company and do not go through rigorous testing processes, they tend to change frequently without notice. In some instances, the use of these standards requires payment of a licensing fee and they are therefore not accessible to the wider public (NPES, 2005).

Reference Standards

Reference standards are documents published by non-profit trade associations, member organizations, standards-writing organizations, governments, and institutional organizations (The CSI Glossary, 2010, p. 45) and describe an industry-established standard for a particular product, material, or process (Rosen, 2010, p. 47). Reference standards are named as such because they are "incorporated by reference" into the specifications (The CIS Glossary, 2010, p. 45). Specifications that cite reference standards are appropriately called reference standard specifications (see Reference Standard Specifications).

A benefit to reference standards is due to the fact that they are written by associations "extremely knowledgeable about a particular aspect of construction technology" (The CSI Glossary, 2010, p. 45). These associations include, for instance, the Architectural Woodwork Association, or they can be performance standards such as the Standard Consumer Safety Performance Specification for Playground Equipment for Public Use, written by the American Society for Testing and Materials (ASTM) (The CSI, 2011, p. 49).

Reference standards tend to be written using minimum performance requirements only. This is because standards are typical consensus documents and the publishing organization must minister to the interests of the greatest number of members. This results in some standards being more "lenient than the specifier intends" (Rosen, 2010, p. 49).

CONCLUSION

Most of the definitions explored in this chapter have been in reference to standards and specifications of object-based construction or for manufactured building materials. While many examples of standards exist on tactile building materials, limited standards (industry, accredited, national, reference, or otherwise) have been written to address living (plant) materials and products. Most living material specifications are written in-house on a project-by-project basis and this can result in a fragmentation of information across the industry. The individual use of personal standards and specifications may cause confusion for suppliers and contractors working between different landscape architects with varying levels of specificity.

While there are some examples of standards for living material (as further discussed in chapter 3), a complete document governed by an industry body about an organic building material could have profound benefits for the the profession of landscape architecture in both Manitoba and Canada. An industry standard could be written by a body of landscape architects (at the regional or national level). In order for these documents to become a document that is not recognized by one or more party members, it would need to adhere to the guidelines outlined earlier as accredited or national standards.

These standards should have a high level of quality, be written by an organization that can commit to significant time investment and that also has access to many knowledgeable members in their areas of specialization. These standards would need to be widely recognized by varying industry groups to ensure the adaptation of the document as a standard of practice.

One of the difficulties of creating a National Standard for living materials (as previously defined by Accredited/National Standards) would be the open consensus process that is required to create an exact and reliable product. In the case of living materials, there are many organizations that are integral to the process and it would be necessary to invite all organizations to participate in the creation of a national standard document.

The next section will discuss what a standard for living materials would be in the profession of landscape architecture, which bodies should be responsible for creating it, what it could look like, how such a document could be produced, the requirements and process to creating it, who would benefit from such a document, what issues would arise and who would be held responsible should problems occur.

CHAPTER THREE

IDEAS IN PRACTICE
(MOVEMENT TO A NATIONAL STANDARD)

EVOLUTION OF A STANDARD FOR LIVING MATERIALS

"The benefits and procompetitive effects of voluntary standards are not in dispute. Standards do everything from solving issues of product compatibility to addressing consumer safety and health concerns. Standards also allow for the systemic elimination of non-value-added product differences (thereby increasing a user's ability to compare competing products), reduce costs and often simplify product development. They also are a fundamental building block for international trade."
(Marasco, n.d.)

The idea of a standard document tailored towards living materials is not entirely new and examples of standards can be found all over the world. One of the more noteworthy examples is the British Standards Institute's Code of Practice for General Landscape Operations (excluding hard surfaces). While it is now slightly outdated, the Code outlines best practices for nursery stock, containers and wrappings, root handling, and the such. The British Standard was compiled by the Basic Data and Performance Criteria for Civil Engineering and Building Structures Standards Committee which is […] (BSI, 1989).

In North America, the United States has the Landscape Specification Guidelines, written by the Landscape Contractors Association "…with landscape contractors, landscape architects, designers, and property managers in mind…" (LCA, n.d.). The publication covers a wide variety of landscape situations including irrigation, tree preservation, seeding and sodding, installation and maintenance. The coverage is quite extensive, however it does not represent or involve the producers of these living materials, nor discuss the role the nursery plays or outline some of the industry standards for that particular group (LCA, n.d.).

There are also examples of Canadian standards or guidelines created for the benefit of the landscape architecture profession. In 1999, the city of Edmonton created a document titled Design and Construction Standards, a thee volume hardcover edition. In 2001 it was amended and expanded, and it is now an eight volume document organized by discipline. One of those volumes is dedicated to landscape topics. Some of the information discussed in this document included details on landscape staking and planting plans, plant list requirements, general recommendations for trees, naturalization directions, designated roadway tree planting corridors, tree and shrub minimum sizes, approved tree species, planting annuals and perennials and weed control (City of Edmonton, 2015).

Another example is the BC Landscape Standard, first published in 1982. This document was a result of a collaboration between the British Columbia Society of Landscape Architects (BCSLA) and the British Columbia Landscape & Nursery Association (BCLNA), and is a collection of information regarding the introduction and care of living materials typically used by landscape architects. It has undergone many edits and updates since its original version and today is an extensive, 17-chapter document outlining grading and drainage, irrigation, growing medium, lawns, grass and sod, plants and planting, mulching, landscapes over structures, container grown plants, maintenance, interior plantings and pest management (BCSLA, 2012).

EVOLUTION OF A STANDARD FOR LIVING MATERIALS

The BC Landscape Standard has been gaining attention from other member firms across the country.

CHAPTER 1. General

1.1 Scope

1.1.1 This Guideline applies to work that has historically been termed 'exterior landscaping'. 'Landscaping' for this Guideline has been outlined as work described by, but not limited to, the following sections and subsections:

- .1 Site Preparation
- .2 Grading and Drainage
- .3 Growing Medium
- .4 Plants and Planting
- .5 Mulching
- .6 Landscaping Over Structures
- .7 Turfgrass/Ground Covers
  - .1 Sodding
  - .2 Seeding
  - .3 Hydroseeding
- .8 Landscape Construction
  - .1 Aggregate Bases
  - .2 Interlocking Concrete Pavers
  - .3 Stone
- .9 Maintenance
  - .1 Establishment
  - .2 Existing
- .10 Integrated Pest Management
- .11 Irrigation
- .12 Lighting
- .13 Snow Removal and Ice Control
- .14 Interiorscaping

1.1.2 This Guideline is also applicable to the areas of administration, design, planning and review that affect the above sections and subsections.

1.1.3 There are many other areas of work considered in the landscaping realm having their own associated guidelines. These may not be dealt with or addressed, in this edition of this Guideline but maybe dealt with in future editions or addenda.

In 2004, the Landscape Ontario Horticultural Trades Association (LOHTA) published the Landscape Guidelines that had very similar structure to the BC Landscape Standard. In fact, General Scopes of both documents are almost identical, and read as shown below.

1 General

1.1. Scope of This Standard

1.1.1. Purpose Statement and Intent

This Standard addresses work that is conventionally termed as landscaping. 'Landscaping' for this Standard has been outlined as work described by but not limited to the following sections:

1. General.
2. General Requirements.
3. Site Preparation and Protection of Existing Site Elements.
4. Grading and Drainage.
5. Irrigation Systems.
6. Growing Medium.
7. Lawns and Grass.
8. Turfgrass Sod.
9. Plants and Planting.
10. Mulching.
11. Landscaping Over Structures.
12. Container Grown Plants.
13. Establishment Maintenance.
14. Landscape Maintenance.
15. Interior Plantscapes.
16. Integrated Pest Management and Plant Health Care.

1.1.2. This Standard also applies to the areas of administration, planning, design, and review that affect the above sections.

1.1.3. The intention of this Standard applies to landscape related items and should be considered such.

Items include, but are not limited to:

1. Landscape lighting.
2. Paving (unit pavers, natural stone paving, decorative paving, etc.).
3. Outdoor structures, and other hardscape elements, (arbours, pergolas, trellises, decks, play equipment, retaining walls, fencing, water features) and site furnishings.

EVOLUTION OF A STANDARD FOR LIVING MATERIALS

The similarities in these two documents from either sides of the country outline the need for a widely recognized national standard. However, in order to become widely recognized a standards document should be grounded collaboration between two (or more) organizing bodies within the profession. The BC Landscape Standard was co-produced between the BCSLA and the nursery producers and the landscape contractor members of the BCLNA. The successful adaptation of the document is attributed to this collaboration and there is a broad consensus of Standard users throughout that province.

Another aspect of the BC Landscape Standard to which its success can be attributed is the creation of the BCSLA/ BCLNA Landscape Standards Committee that not only wrote the document but is responsible for amendments and additions, and organizes the delivery of printed updates to each registered user of the document. Members of the Landscape Standard Committee commit to a two year term. This ensures future commitment from both the BCSLA and the BCLNA and contributes to the future success of the document.

While the document has been well received, there are still some instances in which the standard has not been fully embraced. The BCSLA has noted that they still require more traction with getting the local municipalities to embrace it and use it as their standard. However, for the most part, the landscape industry as a whole in British Columbia has accepted the document and it is widely used throughout the province (CSLA & CNLA, 2014, 30 July).

LIABILITIES OF A STANDARD

"It's not so much writing standards that's the risky part. It's the results of the standards and how the standards might be challenged after the fact."
- Carvin Digiovanni (Keim, 2006)

One of the tasks that the BC Landscape Standard Committee has recently seen to was the inclusion of a precautionary disclaimer at the beginning of the document. This step was taken to ensure the protection of the BCSLA, the BCLNA and the landscape contractors associated with each. This disclaimer clearly outlines that federal, state, and local laws and regulations must be consulted and in no way does this document override any previous policy. They state that in no way must the standard be used to promote an action that is not in line with existing governing policies.

Another part of their disclaimer is to bring awareness to fact that the collaborative groups responsible for the standard have in no way conducted independent tests to verify the accuracy of the information. While the practices outlined in the standard reflect the minimum acceptable landscape construction practices in the province, the risks in using the document falls entirely on the user.

In Chapter 2, it was stated that when referencing a standard, it is safe to say that satisfactory testing has occurred and that a product performs to the minimum requirements as outlined in the specified standard (see: Standard). But what happens when it does not?

In 1990, Carvin Digiovanni started working with the-then named National Spa & Pool Institute (NSPI). One of his projects with the organization was to lead the team through a peer-reviewed process to obtain ANSI-approved standards for the pool and spa industry. After successfully obtaining this particular industry's first ANSI recognition, a consumer lawsuit in 2003 quickly discredited the work done by Digiovanai. The lawsuit cited an outdated standard written by the NSPI responsible for a 1993 incident which left a young man paralyzed while diving into a neighbour's pool. The $6.6 million verdict in the plaintiff's favour discredited not only the standards produced by the NSPI, but also fragmented the NSPI and forced them to file for Chapter 11 bankruptcy, referred to as "reorganization bankruptcy" (US Courts, n.d.). The NSPI first reemerged as the International Aquatics Foundation, and then restructured less than a year later to form what is currently known as the Association of Pool & Spa Professionals (APSP). Shortly after, Digiovanni reassembled another committee of industry representatives including members from the World Waterpark Association, the National Recreation & Park Association and U.S. Diving Organization (Keim, 2006).

LIABILITIES OF A STANDARD

In the same year, the NSPI/APSP was hit with another similar lawsuit citing the original case against the NSPI as a precedent. In this second case, the plaintiff also claimed that improper standards caused a spinal cord injury after he hit is head on the slope leading to the shallow end. The case also named the contractor, who had no affiliation with the NSPI nor did he ever claim to use its standards. The product in question, a pool liner, was a part of a prepackaged kit that also included a diving board and diving board stand. This kit was purchased at a liquidation sale, without prior knowledge as to whether the kit was prepackaged by a distributor to be sold-off-the shelf, or whether it was a combination of products supplied by a previous contractor to be used for a particular installation. The plaintiff argued that the NSPI standard for liner installation, was so similar to the drawing on the box for the pool liner, that the NSPI standard must have been used as a guideline by the manufacturer. According to Pool & Spa News, "No one could recall or definitively identify the liner producer" (Robledo, 2010), therefore it was the NSPI who was cited for producing a standard that the plaintiff claimed to fail to provide appropriate warning about the potential hazards for injury.

The NSPI (who was the APSP at the time of claim) maintained that if their standard had been followed, a pool suitable for diving would not have had the same dimensions as the one in question. In this case, the court rejected the original case and sided with the NSPI stating that "the pool in the [precedent] did qualify as a diving pool under the NSPI standard, but the [pool in question] did not" (Robledo, 2010).

The impact of a national standard can be far reaching and may (as the example shows) even dismember the governing body. Generally the benefits outweigh the drawbacks, but there are numerous ways to reduce the probability that standards can cause more harm than good.

According to Amy Marasco, Vice President of the ANSI, the best way to ensure the public interest "is both served and protected" is to ensure that the "standards developer is accredited by ANSI and meets the Institute's requirements for openness, balance, consensus and other due process safeguards" (Marasco, n.d.). She argues that ANSI-accredited standards developers should not have a "duty of care" imposed upon them by the courts, due to the strictness of their accreditation process.

THE CANADIAN NATIONAL STANDARD

"Based on the successful BC Landscape Standard, this joint initiative will create one single document that will be accepted across the industry, providing the maximum value to all users."
(CSLA/CNLA, 2014)

CONTEXT

While there are many examples of standards from various parts of the world, Canada is quite fragmented in its adaptation of such documents. Each region seems to have their own version of a standard and until recently a full document endorsed by a governing body that covered the entire country did not exist.

In 2014, the Canadian Society of Landscape Architects (CSLA) recognized this void and used the BC Landscape Standard as a basis for creating their own National Standard as a way to develop living material standards across the country. Their goal was to create a document by all means necessary that would qualify for incorporation as an Accredited or National Standard. As previously mentioned this required an inclusive, consensus-building process, therefore the Canadian Nursery Landscape Association (CNLA) was invited to be a part of the process from the beginning (on the recommendation of the BCSLA Landscape Standard Committee). The BCSLA always maintained that their landscape standard was a very successful product of the collaboration between the BCSLA and the BCLNA, and that the "buy-in" from all parties and its subsequent success was attributed to the collaborative processes.

It is important to discuss the relevance of the CSLA and the CNLA bodies to this project. The CSLA is a professional organization comprised of over 1,900 landscape architects as members and is represented by provincial and territorial associations across the country. The mission of the CSLA is to be the voice of landscape architecture in Canada and these bodies, amongst other duties, are responsible for review of the academic programs in Canada (CSLA/CNLA, 2014).

The CNLA is a national federation of ten provincial horticulture associations representing over 3,800 members in the landscape, retail garden centre, and nursery sectors. They are the governing body that can assign Landscape Industry Certification to technical, retail horticulturists, landscape designers and managers (CSLA/CNLA, 2014). This certification ensures credibility and commitment to best practices. In other words it is equivalent to a Better Business Bureau (BBB) recognition for industry members.

The two national bodies work in tandem, in their respective specializations, to ensure practices across the country are controlled, regulated, and performed to a recognized degree of quality. This has proven to be a difficult task with no real quantifying method of measuring these degrees of quality across the nation. Hence, the partnership between the two bodies was essential to ensuring the successful implementation of a national standard of practice.

THE CANADIAN NATIONAL STANDARD

Modelled after the BCSLA's structure, the CSLA/CNLA invited a group of landscape architects, nursery association members, and industry professionals to establish a minimum level of quality that may be recognized by the owner, user and consultant for living materials and their installation (CSLA/CNLA, 2014). The original BC Landscape Standard committee strived to create a document that standardized all aspects of living plant material use to ensure consistency in the manufacturing and production processes throughout the province, while the CSLA/CNLA's vision was much larger.

The newly created CSLA/CNLA's National Standards Steering Committee proposed that these standards could be nationally set and administered. As part of ensuring the longevity of the project, the CSLA and the CNLA each committed to a long-term partnership that would see a Canadian Landscape Standards Committee live on long past the initial inquiry led by the Steering Committee.

This would ensure that updates to the original document were provided to reflect changes in trade practices, evolving technology and new municipal by laws. Lastly, and perhaps most importantly, the update process would provide an opportunity for members of the industry to provide feedback and ensure that all concerns were heard and addressed, making the process as open as possible (CSLA & CNLA, 2014).

The following sections outline the CSLA/CNLA National Standards Steering Committee's process of amending BC's original standards document. It will outline the objectives and goals of the committee, their proposed work plan followed by the actual process that was conducted, the duration of the process, the process of providing updates and the structure of their future committee, and lastly, it will touch on the formal agreement between the Canadian Landscape Standards Committee and the creators of the BC Landscape Standard on which the National Standards were based.

THE CANADIAN NATIONAL STANDARD

OBJECTIVES AND GOALS

Much like the BCSLA, the Steering Committee's first objective was to define the type of document they were to create. They established early on that the document should be a standard to set guidelines for landscape construction projects in Canada. The BC Landscape Standard clearly defines itself as such, stating in its introduction:

"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 is a standard."
(BCSLA, 2012, preface, p. ii)

The BC Landscape Standard is not an accredited standard, instead it is considered to be a widely recognized industry standard (see Chapter One: Industry Standard). It is generally used as a reference standard when writing reference standard specifications. The BCSLA maintains that as a standard it has not necessarily been written with detailed and precise wording and therefore the use of the document as a Specification is not recommended.

Due to the organic nature of living materials, it is difficult to adhere to stringent testing therefore the standard strives to document recognized accepted levels of quality for each of the materials covered. Variables regarding the understanding of the needs of plants will greatly affect the performance of such materials therefore the standard is only successful when cognizant of the proper handling of plants and their growing environments (BCSLA, 2012, preface, p. ii).

Multiple goals were outlined to ensure the process of creation did not stray from the original vision. One goal for this standard was for it to sit on the desk of every industry professional in Canada. This means that the document would have to be available in both English and French versions (CSLA/CNLA, 2014). It would also need to be recognized as a national consensus by the industry as a tool that not only ensures quality but is also easy to use and reference in specification writing.

A second goal outlined by the committee was to have the level of detail, authenticity, and accuracy that was established for the BC standard maintained throughout the national version. In order to achieve this goal, specialists from each industry (including technicians and engineers) were invited to be a part of the re-writing process (CSLA/CNLA, 2014).

Lastly, the Steering Committee was excited about the opportunity to be referenced in all landscape related sections within the National Master Specification for Municipal Services and other identified Specifications that included landscape sections (CSLA/ CNLA, 2014). This recognition would be able to provide increased benefits when dealing with the National Master Specifications. Other recognitions were discussed at the preliminary stage of development, such as including the Landscape Industry Certification as an accepted professional qualification. Additionally there was potential for the document to align with CSA documents in the future as well as have the CSA's support on the project endorsement for the standards (CSLA & CNLA, 2014b).

Right from the start, it was the position of the CSLA and the CNLA to create an overarching national landscape standard document that was complemented by region-specific supplements. It is important to the accuracy of the standard for it to have regional variations as supplementary sections.

The country could be divided regionally according to similar growing conditions and each region could then be responsible for ensuring that their specific conditions were met (CSLA/CNLA, 2014).

The committee also maintained the position that the BCLNA and the BCSLA were to be recognized in the national document for the work that they had put forward in the creation of the BC Standard. Ideas were generated at the onset about a royalty that could be paid to the BCSLA/BCLNA organizations when the National Standard had been completed and was being distributed (CSLA & CNLA, 2014a). But not all recognition was to be monetary. As the BCSLA/BCLNA had viewed the BC Standard as an expansive product that was laboriously put together by the two organizations, there was concern over uses of the document that were not in line with the views of the original producers. To recognize this, the CSLA/CNLA suggested a formal agreement that would ensure continuity between the two documents (CSLA & CNLA, 2014a).

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Five steps were defined in order to bring the National Standard to fruition. The work that was to be included in each step was to be carried out over the course of the review and rewriting process.

WORK PLAN

Step 1: Review

The Steering Committee appointed 3 volunteers from each of the CNLA and the CSLA to undertake a review of the BC Landscape Standard to identify the areas of the standard that would be common nationally and which would need to be regionally specific (CSLA/CNLA, 2014). These committee members conducted a chapter-by-chapter review and reported back to the Steering Committee. In certain instances, additional technical expertise was requested when the committee did not feel comfortable giving advice on certain topics. Those consultants were brought on for a period of time to review the chapter in question and formally submitted their reviews to the committee (CSLA & CNLA, 2014a).

In order for the committee to have control over the consistency of the review process, they developed a checklist of items to consider when reviewing. This ensured that each chapter was managed in a consistent and controlled way for quality assurance, to ensure that each reviewer was checking for similar items. These included:

- Third Party Resources: Anything third party such as related references, standards and legislation, guidelines, tolerances, etc.;

- Qualified Professionals/Supervisors/Supervisions: Which would be necessary to streamline into the Contractor Qualifications clause and must be vetted through the national certification committee;

- Safety: Which must correlate to provincial legislation or bodies empowered to require and enforce safety certification;

- Sampling, Testing & Product Certifications: Anything related to submittals, as in samples or soil, water, product, etc. This was to include any testing and product certifications;

- Pest & Pest Controls: This must conform to municipal by laws or pertinent provincial legislation;

- Guarantees: Anything related to guarantees, warrantees, and acceptance of product or work. It also must conform to provincial legislation or to the Consumers Protection Act.

- Proprietary: Anything that could be considered proprietary should not be included;

- Technical Name Differences: Anything that may have variations in technical notation.
(CSLA & CNLA, 2014b)

WORK PLAN: STEP ONE

Following the committee members' general review, the reports found that overall the sections were well-organized and written. It was estimated that only two to five percent of the BC Landscape Standard would need to be amended or further reviewed for a national application (CSLA & CNLA, 2014c). These amendments were primarily focused on six of the chapters in the BC Standard, including Grading and Drainage, Irrigation Systems, Lawns and Grass, Landscape Over-Structures, Container Grown Plants, and Hard Landscapes.

One of the suggestions for Grading and Drainage (Chapter 4) was to include additional information regarding bio-swales, as it appeared that the topic did not receive much attention in the standard. In parts of the country, bio-swales had become quite popular and the committee agreed that addressing the topic would be beneficial. The recommendation was to consult further with experts in the field for their input (CSLA & CNLA, 2014, 29 October). The use of filter fabrics was another issue that could benefit from further discussion, as

the application appeared to be quite controversial within the committee members themselves. In this instance as well, it was recommended to consult with civil engineers who deal with these issues on a regular basis (CSLA & CNLA, 2014, 29 October).

Irrigation Systems (Chapter 5) also required early assistance from an irrigation consultant. This consultant provided a few suggestions to develop standards that could suit varied municipal by laws. Ultimately, however, the committee decided that this chapter would require regionally specific appendices to adhere to municipal policies. The irrigation consultant agreed to continue to work with the committee on a regional level to ensure continuity across the regional reports (CSLA & CNLA, 2014c).

Chapter 7, Lawns and Grass, had very few changes required, however it was suggested that some adjustments were necessary in relation to stockpiling and seeding. This note could then be carried over and also applied to certain aspects of Chapter 9: Plants and Planting (CSLA & CNLA, 2014c). It was suggested that both of these chapters have regional committees review the information to determine if further amendments would be required at the local level.

For Landscapes Over-Structures (Chapter 11), the BC document talks about a calculation of loads based on construction and during construction, however it does not discuss future loads on the structure. Adding plantings to these structures that may grow quite large (such as trees) has become a concern in the past. The committee recommended that a structural engineer be approached to determine what types of amendment or additions could be made to ensure that this possible problem was not overlooked for the National Standard (CSLA & CNLA, 2014c).

Chapter 12, Container Grown Plants, seemed to be the most widely recognized document that would require regionally specific supplements. While it was found that most of the BC document coincides with the CNLA's National Specification, each province would be required to add a more specific appendix to discuss more local plant recommendations. It was recommended that the National Standard tailor this chapter to be non-specific to each

province and include separate regional appendices. It was also important for the committee to note, however, that the BC document references the CNLA Standard with a disclaimer that municipal standards and regulations still apply (CSLA & CNLA, 2014c).

The last section that required discussion by the review committee was on Hardscapes (Chapter 17). It was noted that there is limited information in the BC Standard for this section, and it was revealed that while the BC committee considered adding more content, they chose instead to refer to other recognized standards. There were two reasons for this. The first was to maintain that this document was designed as a standard for living material, a topic that is limited in its resources within the industry. The second reason was to keep the document more manageable as the range of hardscapes can be quite extensive (CSLA & CNLA, 2014b).

For all other sections, the changes recommended by the committee were minimal and included some edits to both the text as well as the related reference lists for each chapter. In some cases gaps in information were reported and the committee made suggestions to eliminate those and assign ongoing responsibilities for the regional committee (CSLA & CNLA, 2014, 29 October).

Step 2: Organize

Immediately following the review by the Steering Committee, the CSLA put out an official call for national volunteers to sit on the Oversight Committee, later known as the Regional Committee and Reviewers. This committee was to have a representative from each province, tasked with using the information gathered from the review team to create an overarching national standard (CSLA/CNLA, 2014).

The official Steering Committee was also established. It consisted of three members from each the CSLA and the CNLA, one of which acts as the official project coordinator or editor. This Chair is elected by the committee members and works with a Vice-Chair and a Past Chair to ensure continuity (CSLA & CNLA, 2015). The Regional Committee was arranged into five groups, and was made up of ten individuals in equal representation of landscape contractors and landscape architects for each of the following:

1. Central (Ontario & Quebec)
2. West Coast (BC)
3. Atlantic
4. Prairies & North (Alberta, Saskatchewan, Manitoba & Territories)
5. National (CSLA & CNLA, 2015).

The committee representatives were to be appointed from their specific regional member firms. Each region would be responsible for their contribution to the national standard, but we would be able to opt-out of the current release or update to ensure that the greater project would meet its deadlines (CSLA & CNLA, 2015). Later, this regional committee structure was amended to remove the national committee (the Steering Committee would act as the National group), and the BC arm was structured to have three representatives (CSLA & CNLA, 2015). These individuals were required to be sitting members on the BC Landscape Standard Committee, and instead of preparing the regional standards they were to report on the current work of the BC Standard Committee would act as the regional constituent (CSLA & CNLA, 2014, 4 September).

WORK PLAN: STEP TWO

The Steering Committee was then charged with creating a clear outline of the duties or assignments for the Regional Committees.

These nine terms of reference included:

- "to produce [a] national, bilingual version of the landscape standard

- to maintain the integrity of the standard
- The National document should be based on the BC model

- to maintain the scope and the focus of the project

- to maintain editorial control on the content

- to provide scope and coordination to regional committees

WORK PLAN: STEP TWO

- to review the standard and coordinate its updates
- to secure funding for the development of the Canadian Landscape Standard project

- to have the Canadian Landscape Standard go through a legal review prior to printing

- to investigate the feasibility of establishing a Board of Directors."
(CSLA & CNLA, 2015)

The call for volunteers was successful and members from all regions became part of the process with eight to ten members representing each of the regional committees. The Western Committee involved members mostly from Alberta and Manitoba, with one representative from Nunavut (CSLA, n.d.). It was the original goal to see the Western region alternate majority representatives between the Prairies and the North for future terms (CSLA & CNLA, 2015).

Step 3: Create

The creation of the of the national document after moving to the regional committees is not as well documented and varies between the four regional groups. It is therefore difficult to track. It is presumed that the regional committees followed the guidelines outlined by the Steering Committee closely in order to ensure a somewhat consistent approach between regions.

One thing that is known is the approach that was taken for technical industry standards. On advice from the Steering Committee, the regional groups were encouraged to consider contracting some of the work to industry recognized professionals when the area of expertise fell outside of the comfort level of the committee.

Money was made available in equal contributions from both the CSLA and the CNLA (CSLA & CNLA, 2014b). This review work, however, had strict guidelines for the committee to follow when selecting their external reviewer. These individuals must be "Qualified Professionals" (CSLA & CNLA, 2014c) in the industry meaning they had to be recognized by a Red Seal Certification, or hold Certification of Qualification (C of Q) recognition. In addition, the work for the National Standard carried out by these persons was to be reviewed by the CNLA Certification Committee to ensure its accuracy. The areas in the National Standard that were written or reviewed by such individuals was to be referenced as written by "Qualified Professionals" (CSLA/CNLA, 2014).

Step 4: Translate

This step is pretty straight forward, however it was important to note that it was the position of the committee that the standard be translated into French by recognized members of the landscape community to ensure proper usage of known industry terminology (CSLA/CNLA, 2014).

Step 5: Market and Sell

The marketing and sales of the National Standard is to be the primary responsibility of the Steering Committee, along with the assistance of CSLA and CNLA administrative staff. The initial production was to be a printed copy with a digital version available through the CSLA and CNLA's websites. Future editions may be accessed through an app and consultants may have the ability to 'gift' relevant sections of the document to contractors as they see fit (CSLA/CNLA, 2014).

The National Standard will be promoted to identified end-users only, however membership of accredited organizations will not be necessary for purchase, with the intention of reaching as many areas of the industry as possible. This decision will be reviewed after a term by the Steering Committee and a decision will be made at that point whether to continue this practice (CSLA/CNLA, 2014).

WORK PLAN: STEP FIVE

Overall the work plan addresses the requirements of proper ways to produce a national standard. There are some issues that were discussed at preliminary stages of the production that have gone to the overall Steering Committee to investigate, including safety and liability concerns, heritage awareness, and the extent to which the various professional designation references were permitted. Other issues may have been brought up by the regional committees and sent to the Steering Committee to discuss and provide insight into the overall direction of the project. The committee recognized that in some instances, there may be issues or situations where the industry has more than one appropriate way to proceed. It was the position of the Steering Committee to have multiple options (an either/or recommendation) to outline the appropriate, industry-approved methods (CSLA & CNLA, 2014b). In such cases, where the discrepancies between methods occurs due to regional differences, it would be appropriate to have appendices with more extensive instruction to incorporate those regional variations.

DURATION

Initial talks between the review committee began in the late spring of 2014. In early September 2014, the BCSLA put out a call for volunteers for their Landscape Standard Committee and the CSLA coordinated with them at the point of transition to see if any of their new volunteers were interested in sitting in on the review committee (CSLA & CNLA, 2014b). The review process ran throughout the summer and fall and the committee wrapped up the task with their final report in January 2015.

Immediately following the review process, the CSLA/CNLA entered into negotiations with the BCSLA/BCLNA to undertake the nationalization of the landscape standard. These negotiations were finalized in August 2015 and a national call for volunteers went out through the member firms associated with the CSLA/CNLA for regional committee members (CSLA & CNLA, 2015).

Throughout the fall 2015, the regional committees continued with the review process while working on the specific regional differences. The final reports, amendments, and appendices were drafted by the end of the year and went to the Steering Committee for review.

In early 2016, print production started on the now officially titled Canadian Landscape Standard, published jointly by the CSLA and the CNLA. This document is set to be released in Vancouver, British Columbia on 16-18 March 2016 at the Association of Horticulture Producers (AIPH) Conference, hosted by the CNLA. The official release to the CSLA community will take place at the CSLA Congress to be held in Winnipeg in June 2016.

UPDATES

It has always been the position of the CSLA and the CNLA that updates will form an important part of the national standard. One of the tasks of the Steering Committee is to develop a mechanism for consistent review and flexible change to ensure that this living document maintains its relevancy. Some of the benefits of the update process are to allow for consistent reviews to occur, to foster an environment to allow a public review to take place resulting in an all inclusive document emerging, and for information to reflect industry changes in both technology and construction techniques.

Once the standard has been purchased, renewal of the original document will be subscription based and require a small fee. This will fund professional reviews and updates to the regional supplements so that the future versions of the document do not rely solely on industry volunteers (CSLA/CNLA, 2014). In addition, the Steering Committee is considering hiring a consulting group to handle all the updates so that it does not become additional work for either CSLA/CNLA administration (CSLA & CNLA, 2014c).

The frequency of updates will depend on the topics and their rate of change throughout the industry. According to the CSLA's original objective statement, "[a]mendments, supplements and new sections will be published to keep this standard as current and effective as possible" (CSLA/CNLA, 2014).

THE FUTURE OF THE COMMITTEE

The longevity of a project or organization can sometimes be based on the level of commitment from committee members. In order to ensure that the Canadian Landscape Standard project continue to be a product of substance, Terms of Reference were set out for any member who was appointed to the National Standards Committee. These terms were written by the Steering Committee, which consisted of members from the CSLA, CNLA, BCSLA and BCLNA organizations. The committee recognized, however, that the newly formed Canadian Landscape Standard Committee (CLSC) would be responsible for renewal of the terms of reference. The Steering Committee also agreed to remain in place to provide resources for the CLSC, and to dissolve once the CLSC was functional (CSLA & CNLA, 2015).

The terms outlined by the Steering Committee are:

- "The term of appointment for the Chairperson shall be two years to ensure continuity and consistency.

- The West Coast representative shall be elected for two 3-year terms (maximum of two terms). Subsequent West Coast representatives shall sit for 2-year terms.

- The remaining committee members are elected for 2-year terms (maximum of 3 terms).

- Five representatives (one from each region), in the first year, should agree to stand for a one-year term to ensure even rotation on the committee.

- If a committee member needs to be removed or replaced, a supermajority vote (75%) is required." (CSLA & CNLA, 2015).

Lastly, to ensure the success of the CLSC, two additional levels of support from the CSLA and the CNLA were provided to the committee. Firstly, the CSLA and the CNLA would supply the CLSC with an operating budget to cover the development and revisions of the Canadian Landscape Standard, and this would be funded equally by both organizations. Secondly, the CLSC would have access to the services of the Executive Directors and staff from the CSLA and the CNLA for administrative purposes (CSLA & CNLA, 2015).

THE CANADIAN NATIONAL STANDARD

AGREEMENT BETWEEN THE BCSLA/CSLA/BCLNA/CNLA

Early on in the process, the BCSLA offered their support of the CSLA using the document as the basis for the Canadian Landscape Standard. In order for the BCSLA and the BCLNA to offer their official support of the new Canadian Landscape Standard, they needed to reach a formal agreement. Under these circumstances, the four organizations wrote the Memorandum of Understanding between the Canadian Society of Landscape Architects (CSLA) and the Canadian Nursery Landscape Association (CNLA)/and the British Columbia Society of Landscape Architects (BCSLA) and the British Columbia Landscape & Nursery Association (BCLNA) (2015).

This document detailed the vision for the Canadian Landscape Standard, as outlined by the CSLA and CNLA at the onset of the project. The Memorandum highlighted that the work to be done on the National Landscape Standard was a collaborative effort between the CSLA and the CNLA, and that the BCSLA and the BCLNA were to provide the guidance for the project (CSLA, et. al., 2015).

Each partnership agreed to carry out particular tasks and ensure responsibilities were met. The BCSLA and BCLNA agreed to provide the BC Landscape Standard for use by the Canadian Landscape Standard Committee as the basis for their work. They were to continue to provide guidance and support to the Steering Committee, the Regional Committees and the Canadian Landscape Standard Committee in the development of the national document. Immediately following the completion of the first edition of the Canadian Landscape Standard, the BCSLA and the BCLNA would also agree to transfer copyright and ownership to the Standing Committee (CSLA, et. al., 2015).

In return, the CSLA and the CNLA agreed to conduct themselves under the same manner as the terms of reference outlined for the regional committees (see Work Plan - Step 2: Organize) and to provide equal financial and governance support for the development and maintenance of the Canadian Landscape Standard. They also agreed to jointly owned rights of the Canadian Landscape Standard between the CLSA and the CNLA (CSLA, et. al., 2015).

The Memorandum also put a value to the equal monetary contributions between the CSLA and the CNLA. $25,000 would be provided by each organization to support the Canadian Landscape Standard, and additional funding for development would be sourced by both parties. The budget for these contributions was to be created by the Standing Committee (CSLA, et. al., 2015).

The terms of the Memorandum also agreed to a royalty structure provided to the BCSLA and the BCLNA to recognize their extensive work on the original BC Standard document. 12.5% of the sale price per copy is to be paid to each of the BCSLA and the BCLNA (for a total of 25% of sales) for a period of ten years. No royalties are to be paid for the sale of section updates (CSLA, et. al., 2015). After the royalty period expires, the sales of the Canadian Landscape Standard will be part of a national rebate program for each provincial association. Of the net profits, 50% will be split equally between the CSLA and the CNLA.

The remaining 50% will be given back to the provincial landscape architecture associations as well as the provincial landscape horticulture associations, proportionate to each province's sales (CSLA, et. al., 2015).

In addition, the Memorandum outlines the "sunset clause" (CSLA, et. al., 2015). Should the Canadian Landscape Standard Committee fail to publish a National Standard by December 31, 2018, the document will again become the BC Landscape Standard under the BCSLA and the BCLNA (CSLA, et. al., 2015).

CONCLUSION

The approach taken by the CSLA and the CNLA is a well thought-through and structured approach. It takes into account most, if not all, of the issues that accompany the creation of an accredited or industry standard that is very specific to a living construction material. It also deals with issues surrounding the adaptation of a document that has been tailored to suit one specific and localized region. For the sake of simplification, the regional divides proposed by the Standards Committee serves its purpose and handles most sections appropriately. However, some deficiencies arise when closer examination is made to one section in particular - Container Grown Plants.

The variations of plant materials in the Prairies and the North is quite dramatic and closer inspection may be beneficial to the localized industry in Manitoba. The next chapter looks at some of these variations and applies the knowledge gained from the process of the National Standards Committee to create a specifically list of plants tailored to Manitoba's growing conditions.

CHAPTER FOUR

WRITING FOR CONTAINER GROWN PLANTS

INTRODUCTION

All text and tables are from the original document while edits, changes and suggestions to the text and tables have been made in red. Text has been copied as it appears in the original document and is used with permission. The BC Landscape Standard also includes Appendix B: Glossary of Terms to define some of the terminology used throughout the chapters. Those terms that are relevant to this chapter are included below for reference only.

One variable that is unique to a living material standard in North America is the influences of planting zones. Canada ranges from zone zero to zone nine, while Manitoba alone can range from zone zero to zone four. With this extreme regional change, it is difficult to be able to provide a National Standard for sections that include topics specific to each region such as container grown plants, stockpiling and seeding, and irrigation. As outlined in Chapter 3, the CSLA and the CNLA organized regional committees to amend these sections as well as review regional safety and liability issues, heritage references, localized grading and drainage issues, landscapes over structures and regional irrigation methods.

Similar to the methods used by the CSLA and CNLA in the National Standard, the Prairie and North Regional Committee (which included Alberta, Saskatchewan, Manitoba and the Territories) was organized to include members of the Alberta Association of Landscape Architects (AALA), the Manitoba Association of Landscape Architects (MALA), the Irrigation Industry Association of BC (IIABC), the CSLA and the CNLA. It was important to include members of relevant member organizations to ensure the process was open and inclusive to be recognized as an admissible part of the National Standards.

Members who agreed to invest in this committee committed to a two-year term to see through the review process as well as the first round of updates to the regional appendices.

While a regional list of plant species is required for a National Standard to exist, the definitions of the regions themselves may need to be reviewed. Classifying Canadian regions into four groups is one way of segregating the planting conditions, in most cases a smaller scope is necessary to provide a clear and concise list of available plants.

The following is the practical application of rewriting Chapter 12 of the BC Landscape Standard - Container Grown Plants to suit the Province of Manitoba's growing conditions and plant species only. While the regional document includes plant species and techniques that are suitable to container grown plants throughout the three prairie provinces and the north, the methods and specie lists too widely varied. This chapter has been tailored only to the Province of Manitoba's plant species that thrive in our provincial environments.

While the original document only included the most popular species included in landscape projects throughout the province of BC, the approach in the amended version was to include all or most of the current plant species available from recognized growers in the province. This expansive list is meant to encourage landscape architects to be inclusive in their plant selection process in hopes for a more diversified planting schematic throughout the province. In addition, plant species that have been used for many years in the industry and are known to be the ideal plant selection in certain instances, and are preferred for their hardiness, are indicated as such.

GLOSSARY OF TERMS

*Adapted from the BC Landscape Standard, Appendix B: Glossary. This list has been modified to include only those terms that are mentioned in this section of the Standard. These are defined by the BCSLA and are used with permission.

BALLED AND BURLAPPED (B&B) – Plants established in the ground which have been prepared for transplanting by digging so that the soil immediately around the roots remains undisturbed. The ball of earth containing the roots of the plant is then bound up in burlap or similar mesh fabrics.

BARE ROOT (B.R.) – Harvested plants or nursery stock from which the soil or growing medium has been removed from the root system.

BRANCH – On nursery stock, major lateral shoots emanating from a tree trunk; on established trees branches are referred to as limbs.

CALIPER – The diameter of a tree measured at a point that is 15cm (6in) above ground level for trees up to 10cm (4in) caliper. For trees of 10cm (4in) caliper and greater; caliper shall be measured 30cm (12in) above ground level. This is in contrast to the method used to measure trunk diameter in the timber industry and in arboriculture, which is DBH (see DIAMETER AT

BREAST HEIGHT) and is used to measure trees that are above 30cm (12in) caliper.

CERTIFIED NURSERY STOCK – Plants that are designated free of injurious pests and disease.

CONTAINER – Pot in which nursery stock is sold or grown. Containers are manufactured of materials such as peat moss, plastic, wood, paper, cloth, etc. and may vary greatly in size, shape and quality.

CONTAINER GROWN – Plants grown in standard nursery containers appropriate to age and size, and not field-grown or collected.

CONTRACT – A written agreement between the Owner and the Contractor, containing all the conditions of the agreement for a body of work that is to be done. The contract may include the proposal, contract form and bond, general provisions and requirements, standard specifications, special provisions, detailed and standard plans, addenda, change orders, and any agreements that are required to complete the work.

DIAMETER AT BREAST HEIGHT (DBH) – Standard term of trunk diameter measurement for forestry and arboricultural work. The international metric standard for DBH is over bark at a point 1.40m (4.5ft) above the ground.

GIRDLING ROOT – A root that partially or entirely encircles the trunk and/or large buttress roots, which could restrict growth and downward movement of the root system.

GRADE, NURSERY STOCK GRADE – Any and all designations associated with a plant group signifying sizes, qualities and historical details of a nursery stock item.

GLOSSARY OF TERMS

GROUND COVER – Small low-growing dense growth of plants, planted for ornamental purposes or to prevent soil erosion.

GROWING MEDIUM – Material selected or prepared, to the requirements of this Standard or specification for planting and growing plants. Growing medium includes:

1. Imported soil
2. Existing top soil
3. Mixtures of Growing Medium Components

INVASIVE PLANT – Any plant species that has a potential to pose undesirable or detrimental impacts on humans, animals, or ecosystems. Invasive plants have the capacity to establish quickly and easily on new sites and they have widespread negative economic, social, and environmental impacts. Many invasive plants in ~~British Columbia~~ Manitoba are "alien" to North America, and may also be referred to as "non- native", "exotic", or "introduced" plant species. "Noxious weed" is a legislative designation reserved for those species listed under the ~~BC Weed Control Act Regulations~~ MB Noxious Weed Act Regulations.

LANDSCAPE ARCHITECT - A person who is currently a Member in good standing with the ~~BC Society~~ Manitoba Association of Landscape Architects in accordance with the provincial Architects (Landscape) Act, constitution and bylaws and is currently practicing in the field of landscape architecture.

LEAF DENSITY – The approximate percentage of the measurement plane seen as foliage as opposed to light passing through when viewed from the side or from above. Where plants are not in full leaf, the leaf density should be estimated on the basis of density of twigs and buds.

MATERIALS – Any item(s) or substance that may be specified or incorporated into the construction, the Work and its appurtenances.

MEASUREMENT PLANE – The rectangle formed by a plant's spread (S) and height (H).

NATIVE PLANTS – Usually a species known to have existed in a region prior to the influence of humans and occurring naturally to a given geographic locale. Definition depends on the temporal and spatial context of analysis, since long-established exotic species are often considered to be native by default.

NOXIOUS WEED – A legislative designation of a plant species that is, or is liable to be troublesome, intrusive or destructive to agriculture, arboriculture and is difficult to control or eradicate. Designation is reserved for those species listed under the ~~BC Weed Control Act Regulations~~ MB Noxious Weed Act Regulations.

GLOSSARY OF TERMS

NURSERY STOCK – Any plant for planting, propagation or ornamentation including but not limited to:

1. All plants, trees, shrubs, vines, perennials, grafts, cuttings and buds that may be sold for propagation, whether cultivated or from wild sources; and
2. Cut Christmas trees, non-hardy plants, annuals, bedding plants and vegetable plants.

PEST – Any living agent capable of reproducing itself or any of the following that is know to cause damage or harm to agriculture or the environment:

1. Infectious, transmissible or contagious disease of a plant;
2. Forms of animal life; and
3. Forms of vegetable life.

Pests include but are not limited to insects, snails, nematodes, fungi, viruses, bacteria, microorganisms, mycroplasma organisms, weeds, plants or parasitic plants.

PROJECT – Word used to represent the overall scope of work being performed to complete a specific job

REQUIRED – Required by this Standard or by other standards, codes, laws including regulations in force or referenced by this Standard.

ROOT BALL – The intact clump of the main growing roots of a plant and the soil or growing medium adhering to them.

ROOT BOUND – Condition in container-grown plants in which the root system occupies most of the available space and has grown in a crowded, intertwined manner.

ROOT COLLAR – The part of a tree where the main roots join the trunk usually at or near ground level. The transition between roots and trunk are sometimes delineated by a slight swelling; also referred to as 'root-flare'.

ROOT CROWN – The upper-most portion of the root system where the major roots join together at the base of the stem or trunk.

ROOT PRUNING – The act of cutting the roots of large plants, primarily shrubs or trees to force more vigorous growth or to prepare for transplanting; the systematic pruning of roots of nursery plants growing in the field, in order to stimulate branching of roots and the production of fibrous roots.

SAMPLES – Physical examples that illustrate materials, equipment, or workmanship and that establish standards by which the Work will be assessed.

SITE – A geographic location which is under review for work to be conducted or at which the 'Work' is taking place.

GLOSSARY OF TERMS

SHRUB – A woody plant, usually smaller than a tree, that generally produces several stems, rather than a single trunk from the base.

SOIL – Unconsolidated surface mineral and organic materials that in combination with climate and the action of organisms on the soil, provide substrate capable of supporting plant life.

SPECIMEN – A plant, usually a large shrub or tree, that exhibits all the best characteristics normally associated with its type. This designation may be used to indicate exceptionally heavy, well-shaped plants or to emphasize that certain specified traits are required.

SPECIFICATION – A detailed, precise statement of legal particulars as it relates to a particular item.

TOP SOIL – Imported or on-site "A" horizon soil. Top soil contains accumulated organic matter, and can usually be distinguished by a darker coloration. Soils lacking in organic matter and consequently not desired for growing medium will be recognized by a lighter coloration.

TRANSPLANTING – The act of removing and resetting a plant one or more times to improve its size and growth potential characteristics; also refers to moving a plant from one site to another.

TREE – A woody perennial plant that grows from the ground usually with a single permanent, usually tall, woody, self-supporting trunk or stem, and an elevated crown of branches and foliage.

TRUNK – The main stem or axis of a tree that is supported and nourished by the roots and to which branches are attached.

WEED – Any plant growing where it is not wanted and includes unwanted plants in planting beds, unplanted areas, and paving, as well as those grass cultivars that detract from the desired appearance or function of lawn areas.

12 Container Grown Plants

12.1. General

12.1.1. Introduction

~~This section was developed by a committee of the Grower's Group of the BC Landscape & Nursery Association in cooperation with the BCSLA / BCLNA Joint Landscape Standards Committee.~~

This Section is to be used in conjunction with ~~all other sections of this Standard.~~ the Canadian Landscape Standard created by the National Landscape Standards Committee.

Canadian Standards for Nursery Stock requirements shall apply except as and where modified by the requirements of this Section.

12.1.2. Intent

The purpose of this Section is to set out standard methods of measurement and grading for container-grown plants, as accepted both in the Nursery Trade and by Landscape Architects.

12.1.3. Related References, Standards and Legislation

a. Canadian Nursery Landscape Association, *Canadian Standards for Nursery Stock*, current edition.

b. American Nursery & Landscape Association, ANSI Z60.1 - 2004, *American Standard for Nursery Stock*.

12.1.4. Requirements for Container Grown Plants

a. Plants shall have a well-established root system, reaching the sides of the container to maintain a firm ball when removed from the container, but shall not be root bound, or show signs of stem girdling roots.

b. Plants in containers shall not be grown in the same class container for longer than two (2) growing seasons, unless species allows otherwise, and providing that the root system does not become root bound, does not develop girdling roots, or other characteristics detrimental to normal plant development.

c. At the time of potting, all containers shall be filled to within 2.5cm (1in) of the top of the container.

d. Decomposition and settling may reduce the depth of growing medium while the plant is in the container. However, once potted no growing medium should be added or be removed from the container.

12.1.5. Recommendations

a. Specimen plants should be identified in the plant list. Plants designated as Specimen or plants having a unique desirable character should be pre-selected and may be pre-purchased or incorporated by other special agreements.

b. Specimen plants having unique desirable or special characteristics such as unique branching habit, variations from standard minimum caliper, height, branching height, rootball size, foliage density should be clearly specified.

c. Material to be selected by the Consultant should be identified in the plant list and excluded from the tender, and may be pre-purchased or incorporated by other special agreements.

d. All landscape contracts should be awarded with adequate lead-time to assemble the specified material.

e. Where unusually large quantities or sizes are specified, a growing contract should be tendered with adequate lead-time to grow or source the specified material.

12.1.6. Container Classes

a. The plant sizes shown in this Standard are the minimum sizes for the corresponding containers. These sizes are based on well sheared, properly grown material, which meets the proportions and density requirements stated herein.

b. The ~~BC Landscape & Nursery Association~~ Manitoba Nursery Landscape Association has adopted the container classes of the American National Standards Institute (ANSI) American Standard for Nursery Stock (ANSI Z60.1-~~2004~~ 2014), as shown in Table T-12-1: ~~BCLNA~~ MBNLA (ANSI) Container classes are now defined by minimum and maximum volume.

c. Table T-12-2: Some containers common in ~~BC~~ MB Nurseries classed by ~~BCLNA~~ MBNLA (ANSI) Container Classes, shows dimensions, volumes (calculated), and resulting ~~BCLNA~~ MBNLA classification of planting containers commonly used in

~~BC~~ MB nurseries. Canadian Nursery Landscape container classes are also shown for reference.

Table T-12-1: ~~BCLNA~~ MBNLA (ANSI) Container Classes

Container Class	Minimum Volume (cm^3)	Maximum Volume (cm^3)
#SP1	106	131
#SP2	213	246
#SP3	328	492
#SP4	836	1,033
#SP5	1,524	2,229
#1	2,492	4,115
#2	5,246	7,770
#3	10,285	12,164
#5	12,860	20,360
#7	21,913	29,343
#10	34,090	43,376
#15	45,376	60,589
#20	70,096	84,457
#25	94,669	112,472

* TABLE T-12-1 has been taken from approved sources (as outlined below) and therefore is a recognized industry standard.
* #SP1 - #SP5 (AHIA, 2014, Section1, p. 2)
* #1 - #25 (CNLA, n.d.)

Table T-12-2: Some Containers Common in ~~BC~~ MB Nurseries Classed by ~~BCLNA~~ MBNLA (ANSI) Container Classes

MBNLA Class	Common Containers	Inside Height (CM)	Inside Top Dia. or Sq. (cm)	Inside Bottom Dia. (cm)	Volume (cc)
#SP1					106-131
	7cm	7.5	5.5	4.5	186
#SP2					213-246
#SP3					328-492
	9cm	9.5	8	6	456
	BE4S	7.6	8.9 sq	-	470
	BE35MXS	8.9	8.6 sq	-	470
	BE400R	8.7	10 dia	-	470
	TS35	8.3	8.9 sq	-	500
	S370	10.0	9.4 sq	-	550
	SR350	8.9	10 sq	-	590
#SP4					836-1,033
	10cm	10	10	9	900
	11cm	12	11	8	1,056
#SP5					1,524-2,229
	NS 6x5	12.7	15.2	-	1,800
	Scotch Pot	13	15	13	2,000
	BE3S	5.7	6.7 sq	-	2,000
	15cm	13	13	11	2,145
#1					2,492-4,115
CNLA #1		15-18	15-19	12-13	2,146-3,617
	S55	15.2	14 sq	-	2,600
	1 Gallon	18	15	13	2,769
	Short 2	16.2	19.7	-	4,299
#2					5,246-7,770
CNLA #2		19-23	19-23	16-20	4,568-8,346
	2 Gallon	21	21	17	5,951
	NS2	21.6	21.6	-	7,480
	Short 3	18	27	24	9,188
#3					10,285-12,164
CNLA #3		22-26	22-26	21-23	7.983-12,251

MBNLA Class	Common Containers	Inside Height (CM)	Inside Top Dia. or Sq. (cm)	Inside Bottom Dia. (cm)	Volume (cc)
	3 Gallon	23	27	24	11,740
	NS3	23.5	25.4	-	10,746
#5					12,860-20,360
CNLA #5		28-32	24-31	22-26	11,627-20,404
	5 Gallon Tub	23	30	28	15,184
	N129	22.9	30.5	-	15,600
	NS4	30.5	26	-	15,600
	5 Gallon	30	27	24	15,313
	5 Gallon Egg	30	25	22	13,005
	NS7	35.6	30.5	-	19,300
#7					21,913-29,343
CNLA #7		28-32	31-36	28-31	19,128-28,191
	N1410	25.4	35.6	-	23,000
	NS10T	38.1	38.1	-	3,200
	7 Gallon	30	38	33	29,679
					34,090-43,376
	15 Gallon	45	38	31	42,046

12.1.7. Recommended Procedures

a. Specifying Plants.

   a. This Standard should be used as a guide for specifications in lieu of individual nursery catalogues.

   b. All measurements should be specified in metric. Where necessary, conversion Table T-12-3: Metric/Imperial Equivalents, shall be used to establish equivalency between metric and imperial sizes.

Table T-12-3: Metric/Imperial Equivalents

Plants sized by Height or Spread		Plants sized by Caliper	
Imperial	Metric	Imperal	Metric
7.5 in	19.0 cm	1 in	2.5 cm
8 in	20.0 cm	1.25 in	3.0 cm
10 in	25.0 cm	1.5 in	4.0 cm
12 in	30.0 cm	1.75 in	4.5 cm
15 in	40.0 cm	2 in	5.0 cm
18 in	45.0 cm	2.5 in	6.0 cm
20 in	50.0 cm	3 in	8.0 cm
2 ft	60.0 cm	3.5 in	9.0 cm
2.5 ft	80.0 cm	4 in	10.0 cm
3 ft	90.0 cm	4.5 in	11.0 cm
3.28 ft	1.00 m	4.75 in	12.0 cm
4 ft	1.25 m	5 in	13.0 cm
4.5 ft	1.40 m	5.5 in	14.0 cm
5 ft	1.50 m	6 in	15.0 cm
5.5 ft	1.65 m	6.5 in	16.5 cm
6 ft	1.80 m	7 in	18.0 cm
6.56 ft	2.00 m		
7 ft	2.25 m		
8 ft	2.50 m		

c. Plant sizes and container classes falling between those shown in this Standard should not be specified.

d. When specifying by container class, only the ~~BCLNA~~ MBNLA Standard Container classes as shown in Table T-12-1: ~~BCLNA~~ MBNLA (ANSI) Container Classes should be specified.

e. Where the Tables of this Section show no plant size, plants should be specified by container class only.

f. For plants larger than those listed in this standard, plant size only should be specified.

g. Where both container class and plant size are specified according to this Section, both container class and plant size shall be regarded as minimum sizes.

h. Where plant size only is specified, minimum container classes shall be according to this Section.

i. Where container class only is specified, minimum plant sizes shall be according to this Section.

j. Balled and burlapped field-dug plants may be substituted for container grown plants provided rootball sizes and plant sizes meet the requirements of the *Canadian Standards for Nursery Stock*, and provided that the proportion and density requirements of this Standard are met.

Table T-12-4: Balled and Burlapped Substitutes

Approx. Height	Ball Diameter	Ball Depth	Approx. Weight
100-125cm	30cm	25cm	25kg
125-150cm	30cm	25cm	25kg
150-175cm	30cm	25cm	25kg
175-200cm	45cm	30cm	40kg
200-225cm	45cm	30cm	40kg
225-250cm	45cm	40cm	40kg
250-275cm	60cm	30cm	55kg
275-300cm	60cm	30cm	55kg

Approx. Height	Caliper	Ball Dia.	Approx. Ball Depth	Approx. Ball Weight
300-425cm	40mm	40cm	30cm	30kg
300-425cm	45mm	40cm	30cm	35kg
350-500cm	50mm	45cm	40cm	50kg
350-500cm	60mm	45cm	40cm	50kg
425-550cm	70mm	45cm	40cm	55kg
450-575cm	80mm	45cm	40cm	55kg
475-600cm	90mm	60cm	40cm	60kg
500-675cm	100mm	60cm	40cm	60kg

k. Container grown stock that meets the specified size and requirements of this Standard may be substituted for balled and burlapped field-dug plants.

l. Each plant list should contain or be accompanied by the statement: "*Plants in this plant list are specified according to the Canadian Nursery Landscape Association Canadian Standards for Nursery Stock and Section 12 or relevant Section, Container Grown Plants of the ~~BC~~ MB or National Landscape Standard, current edition*".

m. Each plant list should specifically note any exceptions to the above statement.

n. Each plant list transmitted to a supplying nursery should include~~,~~: project name, location and job number, all comments, area of search, designer name and contact information.

b. Approval of Plants.

a. Plants shall be made available for review at source of supply if assembly is specified or negotiated.

b. Plant reviews requiring assembly should be arranged by negotiation with the supplier.

c. Approval of plants at source of supply will not impair the right of the Owner, or Owner's Representative, to review plants upon arrival on site or during the course of construction and reject plants that have been damaged or are not representative of the sample shown.

3. Restocking fees.

a. May be incurred if plants approved at source of supply are subsequently rejected at the site, without reason of damage or being unrepresentative of approved samples.

b. May be incurred if contracted plant orders are cancelled after assembly.

4. Substitutions.

a. All plants shall be supplied as specified on the Plant List.

b. Substitution shall be allowed only when:

i. A search by the Consultant within the appropriate area of search, as shown in the contract documents, proves that the substitution is justified in terms of availability of plants or sizes.

ii. An acceptable substitute of equal value is made available.

iii. Notification is given a minimum of five (5) working days unless otherwise specified prior to the start of planting. Confirmation of changes shall be posted to the Consultant in writing by the supplier or Contractor.

Note: In many instances, it is necessary to obtain approval of substitutions from Authorities having Jurisdiction, which may result in delays. Suppliers should begin reserving and securing plants as soon as they are advised of the intended planting date, and should advise the contractor and the Consultant as soon as possible of proposed substitutions, to facilitate the approval process.

e. Availability.

a. Plants that cannot be located at a wholesaler in the province at the time of planting should be regarded as unavailable, unless the Contract Documents indicated the geographical parameters of search - i.e., Pacific Northwest, Eastern Canada, ~~US~~, Midwest.

b. Department of Agriculture restrictions on the importation of plants shall prevail over and limit the stated parameters of search.

12.1.8. Measuring Container Grown Plants

a. General.

a. This approach applies a standard method of measurement for each type of plant in combination with a minimum percentage of leaf density for each type.

b. Leaf Density is defined as the approximate percentage of the measurement plane seen as foliage (as opposed to light passing through) when viewed from the side (or from above in the case of plants measured by spread). If plants are not in full leaf, the leaf density should be estimated on the basis of density of twigs and buds.

c. Averaging: the measure of each plant shall be the average of two measurements at right angles to each other. Leaf Density shall be the average of two readings taken through the same measurement planes.

d. Measurements shall be based on the main body of the plant, from branch tip to branch tip, excluding leaves and excluding branches outside the main body of the plant.

e. Measurement Plane is defined as the rectangle formed by the plant's spread (S) and height (H).

f. The 'Two-Thirds rule': For medium to tall plants that may not branch right to the ground, the Leaf Density measurement is applied to only the top of the measurement plane. In plants where the characteristic plant habit is higher-branching, ~~the of~~ the measurement plane may be reduced so leaf density is measured for the main body of the canopy.

~~12.1.9. Evergreens – Broadleaf~~

Manitoba does not have enough broadleaf evergreens to make a complete list therefore Section 12.1.9. should be removed from the document, and these plants should be included in other sections.

1. ~~Spreading - Mainly flat types, used as ground covers; height, seldom greater than 30cm (12in) not a significant factor. Measure spread. Minimum leaf density: 50%. Examples:~~

   a. ~~Cotoneaster dammeri.~~

   b. ~~Cytisus decumbens.~~

   c. ~~Erica in variety.~~

   d. ~~Paxistima canbyi.~~

   e. ~~Genista pilosa 'Vancouver Gold'.~~

2. ~~Semi-Spreading - Measure spread. Height is approximately half the spread. Minimum leaf density: 50%. Examples:~~

   a. ~~Buxus microphylla koreana.~~

   b. ~~Prunus laurocerasus 'Zabeliana'.~~

   c. ~~Rhododendron 'Elizabeth' or 'Scarlet Wonder'.~~

   d. ~~Viburnum davidii.~~

3. ~~Globe and Dwarf Forms - Measure designated height. Spread shall not be less than 2/3 of the height. Minimum leaf density: 50%. Examples:~~

   a. ~~Berberis verruculosa.~~

   b. ~~Buxus 'Suffruticosa'.~~

   c. ~~Berberis buxifolia 'Nana'.~~

   d. ~~Ilex crenata 'Convexa'.~~

   e. ~~Pieris japonica.~~

   f. ~~Rhododendron 'Unique' or 'Bow Bells'.~~

~~g. Rhamnus japonica.~~

4. ~~Upright Forms - Measure height, spread shall not be less than 50% of the height. Minimum leaf density: 50% measured in the top 2/3 of the measurement plane. Examples:~~

~~a. Berberis julianae.~~

~~b. Cotoneaster frigidus 'Cornubia'.~~

~~c. Ilex aquifolium.~~

~~d. Ilex opaca.~~

~~e. Rhododendron tall types.~~

~~f. Pyracantha tall types.~~

12.1.9. Deciduous Trees

1. Small Deciduous Trees - Varieties usually not exceeding 8m (26ft) at maturity. Minimum leaf density 50%. Examples:
    a. *Acer ginnala* (clump-form & tree-form).
    b. *Acer ginnala* cultivars.
        a. *Acer ginnala* 'JefUM'.
        b. *Acer ginnala* 'Ruby Slippers'.
    c. *Acer tataricum* 'GarAnn'.
    d. *Caragana* x 'Jefarb'.
    e. *Crataegus* x *mordenensis* cultivars.
        a. *Crateagus* x *mordensis* 'Snowbird'.
        b. *Crateagus* x *mordensis* 'Toba'.
    f. *Malus* x *adstringens* cultivars.
        a. *Malus* x *adstringens* 'Jefgreen'.
        b. *Malus* x *adstringens* 'Durleo'.
        c. *Malus* x *adstringens* 'Pink Spires'.
        d. *Malus* x *adstringens* 'Jefsprie'.
        e. *Malus* x *adstringens* 'Royal Beauty'.
        f. *Malus* x *adstringens* 'Jefmist'.
        g. *Malus* x *adstringens* 'Selkirk'.
        h. *Malus* x *adstringens* 'S. Cohen'.
        i. *Malus* x *adstringens* 'Thunderchild'.
    g. *Malus baccata* cultivars.
        a. *Malus baccata* 'Spring Snow'.

b. *Malus baccata* 'Jefstar'.

h. *Prunus maackii* cultivars.

a. *Prunus maackii* 'Jefspur'.

b. *Prunus maackii* 'Jefdike'.

i. *Prunus virginiana* cultivars.

a. *Prunus virginiana* 'Schubert'.

b. *Prunus virginiana* 'Spur Schubert'.

j. *Prunus* x *nigrella* 'Muckle'.

k. *Prunus nigra* 'Princess Kay'.

l. *Sorbus aucuparia* cultivars.

a. *Sorbus aucuparia* 'Black Hawk'.

b. *Sorbus aucuparia* 'Rossica'.

m. *Sorbus decora.*

n. *Sorbus thuringiaca* 'Fastigiata'.

o. *Syringa reticulata* cultivars.

a. *Syringa reticulata* 'Golden Eclipse'.

b. *Syringa reticulata* 'Willamette'.

c. *Syringa reticula* 'Ivory Silk'.

2. Medium Deciduous Trees - Varieties usually not exceeding 15m (50ft) at maturity. Spread is usually about 40 - 60% of height. Minimum Leaf Density: 50%, measured in the top 2/3 of the measurement plane. Examples:

a. *Acer negundo.*

b. *Acer negundo* 'Baron'.

c. *Acer* x *freemanii* 'Jeffersred'.

d. *Acer platanoides* cultivars.
    a. *Acer platanoides* 'Deborah'.
    b. *Acer platanoides* 'Prairie Splendor'.
e. *Acer rubrum* 'Autumn Spire'.
f. *Acer saccharum* cultivars.
    a. *Acer saccharum* 'Jeferno'.
    b. *Acer saccharum* 'Jefselk'.
    c. *Acer saccharum* 'Jefcan'.
g. *Aesculus glabra.*
h. *Aesculus* x 'Autumn Splendor'.
i. *Alnus hirsuta* 'Harbin'.
j. *Betula pendula laciniata.*
k. *Betula papyrifera* (clump-form and single-stem form).
l. *Betula platyphylia* varieties.
    a. *Betula platyphylia* 'Fargo'.
    b. *Betula platyphylia* 'Varen'.
m. *Betula* x 'Royal Frost'.
n. *Celtis occidentalis.*
o. *Fraxinus mandshurica* 'Mancana'.
p. *Fraxinus* x 'Northern Treasure'.
q. *Fraxinus americana* 'Jefwis'.
r. *Gleditsia triacanthos* 'Harve'.
s. *Juglans nigra.*

t. *Juglans cinerea.*

u. *Ostrya virginiana.*

v. *Phellodendron amurense* 'Longenecker'.

w. *Populus* x *jaackii* 'Northwest'.

x. *Populus tremuloides.*

y. *Pyrus* x 'DurPSN302'.

z. *Quercus* x *jackiana* 'Jefmir'.

aa. *Salix babylonica* 'Lace'.

bb. *Salix* x 'Prairie Cascade'.

cc. *Tilia* x *flavescens* cultivars.

a. *Tilia* x *flavescens* 'Dropmore'.

b. *Tilia* x *flavescens* 'Glenleven'.

dd. *Tilia cordata* cultivars.

a. *Tilia cordata* 'Golden Cascade'.

b. *Tilia cordata* 'Greenspire'.

c. *Tilia cordata* 'Ronald'.

ee. *Tilia mongolica* 'Harvest Gold'.

ff. *Ulmus davidiana japonica* 'Discovery'.

3. Tall and Broad Trees - Varieties include any tree over 18m (60ft) at maturity with spread usually about 50 - 60% of height. Minimum Leaf Density: 50%, measured in the top 2/3 of the measurement plane. Examples:

a. *Acer saccharinum* 'Silver Cloud'.

b. *Fraxinus pennsylvanica* 'Rugby'.

c. *Populus* x 'Assiniboine'.

d. *Populus balsamifera.*

e. *Quercus macrocarpa.*

f. *Quercus ellipsoidalis* 'DurMarg'.

g. *Salix acutifolia.*

h. *Salix alba* 'Vitellina'.

i. *Salix pentandra.*

j. *Salix alba* 'Serica'.

k. *Tilia americana.*

l. *Tilia americana* 'Duros'.

m. *Ulmus americana* cultivars.

a. *Ulmus americana* 'Brandon'.

b. *Ulmus americana* 'Lewis & Clark'.

n. *Ulmus* x 'Morton Glossy'.

4. Tall and Columnar Trees - Varieties include trees over 10m (32ft) at maturity with a spread less than 40% of height. Minimum Leaf Density: 50%, measured in the top 2/3 of the measurement plane. Examples:

a. *Betula platyphylia* 'Jefpark'.

b. *Populus* x *canadensis* 'Prairie Sky'.

c. *Populus deltoides* 'Jefcot'.

d. *Populus* x 'ACWS151'.

12.1.10. Evergreens – Coniferous

All modifications to section 12.1.10 came from Northern Garden Collection, 2011, Northern Garden Collection, 2013, and Northern Garden Collection, 2016.

1. Dwarf Coniferous Evergreens - Including groundcover and flat types usually not exceeding 100cm (39in) in height. Measure spread (height not considered). Minimum Leaf Density 75%. Examples:

    a. ~~Juniperus communis 'Repanda'.~~

    b. *Juniperus horizontalis* cultivars.

        i. *Juniperus horizontalis* 'Blue Chip'.

        ii. *Juniperus horizontalis* 'Hughes'.

        iii. *Juniperus horizontalis* 'Monber'.

        iv. *Juniperus horizontalis* 'Prince of Wales'.

        v. *Juniperus horizontalis* 'Youngstown'.

    c. *Juniperus sabina* ~~*tamariscifolia*~~.

    d. *Juniperus sabina* 'Arcadia'.

    e. *Picea abies* ~~'Nidiformis'~~. cultivars.

        i. *Picea abies* 'Pumila'

        ii. *Picea abies* 'Little Gem'.

    f. ~~*Taxus baccata* 'Repandens'.~~

    g. *Thuja occidentalis* ~~'Little Gem'~~. cultivars.

        i. *Thuja occidentalis* 'Danica'

        ii. *Thuja occidentalis* 'Hetz Midget'

        iii. *Thuja occidentalis* 'Little Grant'.

    h. *Pinus mugo pumilio*.

i. *Juniperus sabina* cultivars.

i. *Juniperus sabina* 'Blue Danube'.

ii. *Juniperus sabina* 'Blue Forest'.

iii. *Juniperus sabina* 'Calgary Carpet'.

iv. *Juniperus sabina* 'Savin'.

v. *Juniperus sabina* 'Skandia'.

j. *Juniperus squamata* 'Blue Star'.

k. *Juniperus chinesis* cultivars.

i. *Juniperus chinesis* 'P. Aurea Gold Lace'

ii. *Juniperus chinesis* 'P. Aurea'.

l. Microbiota decussate.

2. Medium Coniferous Evergreens - Cultivars usually not exceeding 200cm (79in) including semi-spreading, globes and compact upright types. Minimum leaf density 75%. Examples:

a. ~~*Juniperus chinensis* 'Pfitzeriana' in variety.~~

b. ~~*Juniperus Sabina*~~.

c. *Picea abies* '~~Echiniformis~~'. cultivars.

i. *Picea abies* 'Ohlendorffi'

ii. *Picea abies* 'Pendula'.

iii. *Picea abies* 'Nidiformis'.

d. *Pinus mugo mughus* (trimmed).

e. *Taxus cuspidata* ~~spreading types~~. 'Morden'.

f. *Thuja occidentalis* '~~Little Champion~~'. cultivars.

i. *Thuja occidentalis* 'Woodwardi'.

ii. *Thuja occidentalis* 'Bailjohn'.

g. *Abies balsam* 'Nana'.

h. *Picea pungens* 'Globosa'.

i. *Picea omorika* 'Nana'.

3. Tall and Columnar Coniferous Evergreens – Width (W) is approximately 1/3 of height (H). Measure height. Minimum Leaf Density: 75%, measured in the top 2/3 of the measurement plane. Examples:

   a. ~~*Juniperus chinensis* 'Mountbatten'~~.

   b. *Juniperus scopulorum* ~~'Springbank'~~. cultivars.

      i. *Juniperus scopulorum* 'Medora'.

      ii. *Juniperus scopulorum* 'Bailigh'.

   c. ~~*Juniperus virginiana* 'Skyrocket'~~

   d. ~~*Taxus media* 'Hicksii'.~~

   e. *Thuja occidentalis* ~~'Smaragd'~~. cultivars.

      i. *Thjua occidentalis* 'Nigra'.

      ii. *Thuja occidentalis* 'Holmstrup'.

      iii. *Thjua occidentalis* 'Skybound'.

      iv. *Thuja occidentalis* 'Techny'.

      v. *Thuja occidentalis* 'Wareana'.

   f. ~~*Thuja occidentalis* 'Fastigiata'~~.

4. Tall and Broad Coniferous Evergreens – This group includes most of the forest trees frequently used as lawn specimens, or for shelter, or planting. Width is usually about 40% of height . Measure height. Height shall be determined midway between the tip of the leader and the uppermost whorl. Minimum leaf density: 75%, measured in the top 2/3 of the measurement plane.
   Examples:

   a. ~~*Picea abies.*~~

b. ~~*Pinus nigra.*~~

c. ~~*Pseudotsuga menziesii* 'Glauca'.~~

d. ~~*Thuja plicata.*~~

e. ~~*Thuja plicata* 'Excelsa'.~~

f. *Larix siberica*

g. *Picea pungens* cultivars.

i. *Picea pungens* 'Glauca'.

ii. *Picea pungens* 'Select Blue'.

iii. *Picea pungens* 'Baby Blue'.

h. *Picea glauca* 'Densata'.

i. *Pinus uncinata.*

j. *Pinus ponderosa.*

k. *Pinus sylvestris.*

l. *Pinus cembra.*

12.1.11. Deciduous Shrubs

All modifications to section 12.1.11 came from Northern Garden Collection, 2011 and from Northern Garden Collection, 2013.

1. Dwarf Shrubs - Seldom exceed 100cm (39in) at maturity. Measure spread. Minimum Leaf Density: 50%. Examples:
    a. ~~*Cotoneaster adpressa praecox*~~.
    b. ~~*Ligustrum vulgare* 'Lodense'~~.
    c. *Potentilla fruticosa*. cultivars.
        i. *Potentilla fruticosa* 'Abbotswood'.
        ii. *Potentilla fruticosa* 'Cor.Triumph'.
        iii. *Potentilla fruticosa* 'Goldfinger'.
        iv. *Potentilla fruticosa* 'Gold Star'.
        v. *Potentilla fruticosa* 'UMan'.
        vi. *Potentilla fruticosa* 'McKay's White'.
        vii. *Potentilla fruticosa* 'Orange Whisper'.
        viii. *Potentilla fruticosa* 'Pink Beauty'.
        ix. *Potentilla fruticosa* 'Bailmeringue'.
        x. *Potentilla fruticosa* 'McKay's White'.
    d. *Spiraea x bumalda* '~~Anthony Waterer~~'. cultivars.
        i. *Spiraea* x *bumalda* 'Anthony Waterer'.
        ii. *Spiraea* x *bumalda* 'Flaming Mound'.
        iii. *Spiraea* x *bumalda* 'Goldflame'.
        iv. *Spiraea* x *bumalda* 'Gumball'.
        v. *Spiraea* x *bumalda* "Mini Sunglo'.

vi. *Spiraea* x *bumalda* 'Denistar'.

e. ~~*Symphoricarpus* x *chenaultii* 'Hancock'~~.

f. *Viburnum opulus* 'Nanum'.

g. *Arctostaphylos uva-ursi.*

h. *Berberis thunbergii* cultivars.

i. *Berberis thunbergii* 'Concorde'.

ii. *Berberis thunbergii* 'Bailgreen'.

iii. *Berberis thunbergii* 'Rose Glow'.

iv. *Berberis thunbergii* 'Monry'.

v. *Berberis thunbergii* 'Monomb'.

i. *Caragana frutex* 'Globosa'.

j. *Caragana pygmaea.*

k. *Euonymus nana* 'Turkestanica'.

l. *Euonymus alatus* 'Compactus'.

m. *Genista lydia.*

n. *Hydrangea paniculata* cultivars.

i. *Hydrangea paniculata* 'ILVOBO'.

ii. *Hydrangea paniculata* 'Bombshell'.

o. *Prunus tenella.*

p. *Rhus aromatica* 'Gro-Low'.

q. *Salix brachycarpa* 'Blue Fox'.

r. *Salix purpurea* 'Nana'.

s. *Sambucus racemosa* 'Goldenlocks'.

t. *Spiraea japonica* cultivars.

i. *Spiraea japonica* 'Mertyann'.

ii. *Spiraea japonica* 'Yan'.

iii. *Spiraea japonica* 'Little Princess'.

iv. *Spiraea japonica* 'Magic Carpet'.

v. *Spiraea japonica* 'Shirobana'.

vi. *Spiraea japonica* 'Goldmound'.

u. *Spiraea trilobata*

v. *Spiraea trilobata* 'Fairy Queen'.

w. *Spiraea betulifolia* 'Tor'.

x. *Spiraea media* 'SMSMBK'.

y. *Syringa* x 'SMSXPM'.

z. *Weigela florida* cultivars.

i. *Weigela florica* 'Minuet'.

ii. *Weigela florida* 'Verwig'.

iii. *Weigela florida* 'Rumba'.

iv. *Weigela florida* 'Tango'.

2. Medium Growing Shrubs - Mainly compact growing shrubs, usually not greater than 200cm (79in) at maturity. Measure height or spread. Minimum Leaf Density: 50% (If height is measured, 50% in the top 2/3 of the measurement plane). Examples:

a. ~~*Chaenomeles speciosa*~~.

b. ~~*Cotoneaster acutifolius*~~.

c. ~~*Deutzia compacta*~~.

d. ~~*Euonymus alatus*~~.

e. ~~*Ligustrum 'Vicaryi'*~~.

f. *Philadelphus coronarius* '~~Aureus~~'. 'Aurea'

g. ~~*Philadelphus lemoinei* 'Erectus'~~.

h. *Ribes alpinum*.

i. ~~*Spiraea vanhouttei*.~~

j. *Acer ginnala* 'Durglobe'.

k. *Aronia melanocarpa* 'Autumn Magic'.

l. *Berberis thunbergii* 'Bailone'.

m. *Cornus alba* cultivars.

   i. *Cornus alba* 'Gouchaulti'.

   ii. *Cornus alba* 'Bailhalo'.

   iii. *Cornus alba* 'Siberian Pearls'.

   iv. *Cornus alba* 'Jefreb'.

n. *Cornus serica* cultivars.

   i. *Cornus serica* 'Farrow'.

   ii. *Cornus serica* 'Neil Z'.

   iii. *Cornus serica* 'Silver & Gold'.

o. *Corylus americana*.

p. *Cotinus coggygria* cultivars .

   i. *Cotinus coggygria* 'Royal Purple'.

q. *Diervilla sessilifolia* 'LPDC Podaras.

r. *Elaeagnus* x 'Jefmorg'.

s. *Hydrangea macrophylla* 'Bailmer'.

t. *Hydrangea arborescens* 'PIIHM-II'.

u. *Hydrangea arborescens* cultivars.

i. *Hydrangea arborescens* 'Abetwo'.

ii. *Hydrangea arborescens* 'NCHA1'.

iii. *Hydrangea arborescens* 'Annabelle'.

v. *Hydrangea paniculata* cultivars.

i. *Hydrangea paniculata* 'Limelight'.

ii. *Hydrangea paniculata* 'Little Lamb'.

iii. *Hydrangea paniculata* 'DVPpinky'.

iv. *Hydrangea paniculata* 'Phantom'.

v. *Hydrangea paniculata* 'Bulk'.

vi. *Hydrangea paniculata* 'Renhy'.

vii. *Hydrangea paniculata* 'Wim's Red'.

viii. *Hydrangea paniculata* 'Jane'.

ix. *Hydrangea paniculata* 'Rensun'.

x. *Hydrangea paniculata* 'SMPOTW'.

w. *Lonicera* x *xylosteoides* 'Miniglobe'.

x. *Philadelphus* lewisii 'Blizzard'.

y. *Philadelphus* x 'Galahad'.

z. *Philadelphus* x 'Snowbelle'.

aa. *Physocarpus opulifolius* cultivars.

i. *Physocarpus opulifolius* 'Jefam'.

ii. *Physocarpus opulifolius* 'Center Glow'.

iii. *Physocarpus opulifolius* 'Mindia'.

iv. *Physocarpus opulifolius* 'Podaras 3'.

v. *Physocarpus opulifolius* 'Dart's Gold'.

vi. *Physocarpus opulifolius* 'Monlo'.

vii. *Physocarpus opulifolius* 'Seward'.

viii. *Physocarpus opulifolius* 'Donna May'.

bb. *Prunus* x *cistena*.

cc. *Rhus typhina* 'Baitiger'.

dd. *Ribes aureum*.

ee. *Sambucus nigra* 'Eva'.

ff. *Sambucus racemosa* cultivars.

i. *Sambucus racemosa* 'Morden Golden Glow'.

ii. *Sambucus racemosa* 'Sutherland Golden'.

gg. *Sambucus nigra* 'Thundercloud'.

hh. *Sorbaria* x 'Aurora'.

ii. *Sorbaria* x 'Sem'.

jj. *Spiraea* x *bumalda* 'Froebelli'.

kk. *Spiraea nipponica* 'Snowmound'.

ll. *Spiraea* x *trilobata* 'Snowhite'.

mm. *Symphoricarpos occidentalis*.

nn. *Symphoricarpos* x *doorenbosii*.

oo. *Syringa* x *hyacinthiflora* 'Maiden's Blush'.

pp. *Syringa vulgaris* cultivars.

i. *Syringa vulgaris* 'Little Boy Blue'.

ii. *Syringa vulgaris* 'Wedgewood Blue'.

iii. *Syringa vulgaris* 'Prairie Petite'.

qq. *Syringa* x *prestoniae* 'Charisma'.

rr. *Syringa* x 'Penda'.

ss. *Syringa meyeri* 'Palibin'.

tt. *Syringa* (*patula* x *macrophylla*) x *meyeri*.

uu. *Viburnum dentatum* 'Christom'.

vv. *Viburnum trilobum* 'Compactum'.

ww. *Viburnum lantana* cultivars.

i. *Viburnum lantana* 'Emerald Triumph'.

ii. *Viburnum lantana* 'Mohican'.

xx. *Weigela florida* 'Red Prince'.

3. Tall Growing Shrubs - This group includes tall growing shrubs of substantial habit generally 200cm (79in) or more at maturity. Measure height. Spread shall be not less than 40% of height. Minimum Leaf Density: 50%, measured in the top 2/3 of the measurement plane. Examples:

a. ~~*Acanthopanax sieboldianus*~~.

b. ~~*Chaenomeles lagenaria*~~.

c. *Forsythia* ~~tall cultivars~~. x 'Northern Gold'.

d. *Lonicera* ~~tall cultivars~~. *tatarica* cultivars.

i. *Lonicera tatarica* 'Honeyrose'.

e. ~~*Philadelphus* tall cultivars~~.

f. *Prunus triloba* ~~multiplex~~. 'Multiplex'.

g. ~~*Sambucus nigra* 'Aurea'~~..

h. *Syringa ~~chinensis~~*. x *hyacinthiflora* 'Pocahontas'.

i. ~~*Viburnum opulus*~~.

j. ~~*Viburnum lantana*~~.

k. ~~*Ribes sanguineum*~~.

l. *Cornus sericea.*

m. *Cornus sericea* cultivars.

i. *Cornus sericea* 'Bud's Yellow'.

ii. *Cornus sericea* 'Cardinal'.

n. *Cornus alba* 'Morden Amber.

o. *Cotoneaster lucidus.*

p. *Rhus glabra.*

q. *Salix interior.*

r. *Shepherdia argentea.*

s. *Syringa vulgaris* cultivars .

i. *Syringa vulgaris* 'Madame Lemoine'.

ii. *Syringa vulgaris* 'President Grevy'.

iii. *Syringa vulgaris* 'Sensation'.

iv. *Syringa vulgaris* 'Paul Thirion'.

t. *Syringa* x *prestoniae* 'Miss Canada'.

u. *Viburnum lentago.*

4. Tall Growing Shrubs of Slender Habit - This group includes tall growing shrubs of slender habit generally 200cm (79in) or more at maturity. Measure height. Width shall be not less than 30% of height. Minimum Leaf Density: 40%, measured in the top 2/3 of the measurement plane. Examples:

a. *Caragana arborescens.*

b. ~~*Cornus alternifolia*~~.

c. ~~*Euonymus europaeus*~~.

d. *Syringa vulgaris*.

e. ~~*Tamarix pentandra*~~.

f. ~~*Viburnum lentago*~~.

g. *Amelanchier anlifolia* 'Obelisk'.

h. *Caragana arborescens* 'Lorbergii'.

i. *Syringa vulgaris* cultivars.

   i. *Syringa vulgaris* 'Krasavitsa Moskovy'.

   ii. *Syringa vulgaris* 'Charles Joly'.

j. *Syringa* x *prestoniae* cultivars.

   i. *Syringa* x *prestoniae* 'Coral'.

   ii. *Syringa* x *prestoniae* 'Donald Wyman'.

   iii. *Syringa* x *prestoniae* 'Minuet'.

   iv. *Syringa* x *prestoniae* 'Royalty'.

   v. *Syringa* x *prestoniae* 'Agnes Smith'.

k. *Syringa patula* 'Miss Kim'

l. *Syringa villosa*

m. *Viburnum trilobum*

n. *Viburnum trilobum* 'Alaska'.

o. *Viburnum opulus* 'Sterile'

12.1.12. Equivalent Plant Sizes / Container Classes

1. Table T-12-~~4~~5 to T-12-~~11~~10: Equivalent Plant Sizes / Container Classes shows minimum plant dimension (height or spread) for a variety of broadleaf evergreens, coniferous evergreens, deciduous shrubs, vines and creepers, groundcovers, native conifers, native deciduous trees, and native shrubs. See changes following each Table.

~~Table T-12-4: Equivalent Plant Sizes / Container Classes - Broadleaf Evergreens~~

~~For plant sizes larger than those shown, specify height or spread only.~~

Similarly to Section 12.1.9, Manitoba does not have enough broadleaf evergreens to make a compete list therefore Table T-12-4 should be removed from the document, and these plants should be included in other sections.

Plant	Container Class			Plant	Container Class		
	#1	#2	#3		#1	#2	#3
Abelia	25cm	30cm	50cm	*Lavandla*	Specify container class only		
Andromeda	10cm	-	-	*Ledum*	30cm	40cm	-
Arbutus unedo	30cm	50cm	80cm	*Leucothoe*	20cm	30cm	50cm
Aucuba japonica	20cm	30cm	50cm	*Ligustrum texanum*	25cm	40cm	50cm
Azalea japonica				*Magnolia grandiflora*	50cm	60cm	90cm
med., large cultivars	15cm	25cm	40cm	*Mahonia*			
dwarf cultivars	10cm	20cm	40cm	tall growing cultivars	20cm	40cm	50cm
Bamboo				compact low cultivars	15cm	25cm	40cm
tall cultivars	30cm	60cm	1.25m	*Myrica*	30cm	40cm	50cm
dwarf cultivars	Specify container class only			*Nandina*			
Berberis				tall growing cultivars	25cm	40cm	50cm
large cultivars	20cm	30cm	50cm	low growing cultivars	15cm	20cm	25cm
compact cultivars	15cm	25cm	40cm	*Osmanthus*	20cm	30cm	50cm
Buxus macrophylla	15cm	25cm	40cm	*Osmarea*	20cm	30cm	50cm

Plant	Container Class			Plant	Container Class		
	#1	#2	#3		#1	#2	#3
Camellia	25cm	40cm	60cm	*Phillyrea*	30cm	40cm	50cm
Ceanothus	20cm	30cm	50cm	*Photinia*	30cm	40cm	50cm
Choisya	25cm	40cm	50cm	*Pieris*			
Cotoneaster				tall growing cultivars	20cm	30cm	50cm
tall growing cultivars	40cm	50cm	70cm	low growing cultivars	15cm	25cm	40cm
low growing cultivars	15cm	-	-	*Prunus*			
Cytisus & Genista				tall growing cultivars	25cm	40cm	60cm
tall growing cultivars	25cm	40cm	-	low growing cultivars	20cm	30cm	50cm
low or spreading var.	15cm	30cm	-	*Pyrancantha*	30cm	50cm	80cm
Daphne	15cm	-	-	*Raphiolepis*	20cm	30cm	50cm
Elaeagnus	20cm	30cm	50cm	*Rhododendron*			
Escallonia	20cm	30cm	50cm	tall growing cultivars	15cm	30cm	50cm
Eucalyptus	50cm	60cm	90cm	dwarf cultivars	10cm	20cm	30cm
Euonymus				*Rosmarinus*	Specify container class only		
tall growing cultivars	20cm	30cm	50cm	*Sarcococca*			
dwarf cultivars	-	21cm	25cm	tall growing cultivars	20cm	30cm	40cm
Fatshedera				low growing cultivars	15cm	25cm	35cm
Multi or single	30cm	50cm	60cm	*Skimmia*			
Fatsia				tall growing cultivars	20cm	30cm	50cm
Multi or single	25cm	40cm	50cm	low growing cultivars	15cm	25cm	35cm
Ferns	Specify container class only			*Stranvaesia*	20cm	40cm	60cm
Heathers	Spcify container class only			*Vaccinium*	20cm	40cm	60cm
Calluna				*Viburnum*			
Edrica				tall growing cultivars	25cm	40cm	60cm
Daboecia				medium growing & compact cultivars	20cm	30cm	50cm
Ilex				low growing cultivars	15cm	25cm	40cm

Plant	Container Class			Plant	Container Class		
	#1	#2	#3		#1	#2	#3
tall growing cultivars	20cm	40cm	60cm	*Yucca*	20cm	30cm	50cm
low growing cultivars	20cm	30cm	50cm				
dwarf cultivars	15cm	25cm	40cm				
Kalmia	20cm	30cm	50cm				

Table T-12-5: Equivalent Plant Sizes / Container Classes - Deciduous Trees

All modifications to Table T-12-5 came from Herman and Quan, 2006 and Knowles, 2003.

	Container Class				
Plant	#1	#2	#4	#7	#10
Acer ginnala	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Acer platanoides	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Acer saccharinum	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Acer saccharum	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Acer spicatum	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Acer tataricum	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Acer tataricum ssp. *ginnala*	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Aesculus glabra	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Aesculus hippocastanum	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Alnus rugosa	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Alnus tenuifolia	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Betula albo-sinensis	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Betula davurica	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Betula fontinalis	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Betula nigra	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Betula platyphylla	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Betula pendula	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Catalpa speciosa	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Crataegus arnoldiana	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Crataegus x mordenensis	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Elaeagnus angustifolia	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Euonymus europaeus	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Fraxinus americana	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m

	Container Class				
Plant	#1	#2	#4	#7	#10
Fraxinus mandshurica	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Fraxinus pennsylvanica	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Ginkgo biloba	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Gleditsia triacanthos	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Gynnodladus dioicus	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Juglans cinerea	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Juglans nigra	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Lonicera tatarica	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Malus arnoldiana 'Tanner'	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Malus baccata	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Malus hybrids	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Malus pumila	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Phellodendron amurense	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Populus alba	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Populus x *berolinensis*	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Populus x *canescens* 'Tower'	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Populus deltoides	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Populus hybrids	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Populus x *Jackii* 'Northwest'	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Populus x *petrowskyana*	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Populus tremula 'Erecta'	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Prunus armeniaca var. *mandshurica*	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Prunus maackii	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Prunus nigra	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Prunus x *nigrella* 'Muckle'	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Prunus padus var. *commutata*	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Prunus pensylvanica	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m

	Container Class				
Plant	#1	#2	#4	#7	#10
Pyrus ussuriensis	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Quercus borealis	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Quercus mongolica	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Salix acutifolia	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Salix alba	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Salix alba 'Vitellina'	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Salix alba 'Chermesina'	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Salix pentandra	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Sorbus americana	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Sorbus aucuparia	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Syringa reticulata	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Tilia cordata	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Tilia mongolica	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Ulmus davidiana var. *japonica*	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m
Ulmus pumila	30cm - 45cm	45cm - 60cm	91cm - 1.2m	1.5m - 1.8m	2.1m - 2.4m

Table T-12-5~~6~~: Equivalent Plant Sizes / Container Classes - Coniferous Evergreens

For plant sizes larger than those shown, specify height only up to 3m (10ft) height.

Plant	Container Class			Plant	Container Class		
	#1	#2	#3		#1	#2	#3
Abies				*Microbiota*	30cm	40cm	50cm
Low branched unless otherwise specified				*Picea*			
tall growing cultivars	30cm	50cm	80cm	tall growing varieites	30m	50cm	80cm
slow growing cultivars	20cm	30cm	50cm	slow growing & dwarf var.	25cm	40cm	50cm
dwarf varieites	15cm	25cm	40cm	*Pinus*			
Araucaria	15cm	30cm	60cm	tall growing varieites	30cm	50cm	80cm
Cedrus	30cm	50cm	80cm	Low branched unless otherwise specified.			
Calocedrus	30cm	50cm	80cm	slow growing & dwarf var.	15cm	25cm	40cm
Low branched unless otherwise specified				*Pseudotsuga*	30cm	50cm	80cm
Chamaecyparis				*Sciadopitys*	15cm	30cm	50cm
tall growing cultivars	30cm	50cm	80cm	*Sequoia*	30cm	50cm	80cm
slow growing & dwarf var.	20cm	30cm	50cm	*Taxodium*	30cm	50cm	80cm
Cryptomeria				Low branched unless otherwise specified.			
tall growing cultivars	30cm	50cm	80cm	*Taxus*			
slow growing & dwarf var.	15cm	30cm	50cm	medium growing cultivars	30cm	50cm	80cm
Cupressocyparis	30cm	50cm	80cm	spreading cultivars	20cm	30cm	50cm
Cupressus	30cm	50cm	80cm	slow growing cultivars	15cm	30cm	50cm
Ginkgo				*Thuja*			
Specify height only up to 2.5m				tall growing cultivars	40cm	60cm	80cm
Specify caliper only over 2.5m				medium growing cultivars	30cm	50cm	80cm
Juniperus	Measure spread			slow growing & dwarf var.	15cm	30cm	50cm
tall growing cultivars	30cm	50cm	80m	*Tsuga*			
spreading & semi-spreading varieites	20cm	30cm	50cm	tall growing varieites	30cm	50cm	80cm
Larix				slow growing & dwarf var.	25cm	40cm	50cm
tall growing varieites	30cm	50cm	80cm				

Plant	Container Class			Plant	Container Class		
	#1	#2	#3		#1	#2	#3
slow growing & dwarf var.	15cm	30cm	50cm				
Metasequoia	30cm	50cm	80cm				
Low branched unless otherwise specified							

All modifications to Table T-12-6 came from Herman and Quan, 2006 and Knowles, 2003.

	Container Class				
Plant	#1	#2	#3	#5	#10
Abies concolor	20cm	30cm	50cm	80cm	1.2m
Abies lasiocarpa	30cm	50cm	80cm	1.2m	2m
Abies sibirica	30cm	50cm	80cm	1.2m	2m
Juniperus communis	20cm	30cm	50cm	80cm	1.2m
Juniperus horizontalis	20cm	30cm	50cm	80cm	1.2m
Juniperus procumbens 'Nana'	20cm	30cm	50cm	80cm	1.2m
Juniperus sabina	20cm	30cm	50cm	80cm	1.2m
Juniperus scopulorum	30cm	50cm	80cm	1.2m	2m
Juniperus virginiana	30cm	50cm	80cm	1.2m	2m
Juniperus x media 'Pfitzerana'	20cm	30cm	50cm	80cm	1.2m
Larix kaempferi	30m	50cm	80cm	1.2m	2m
Larix sibirica	30cm	50cm	80cm	1.2m	2m
Picea abies	30cm	50cm	80cm	1.2m	2m
Picea engelmannii	30cm	50cm	80cm	1.2m	2m
Picea glauca var. *densata*	30cm	50cm	80cm	1.2m	2m
Picea omorika	25cm	40cm	50cm	80cm	1.2m
Picea pungens	30cm	50cm	80cm	1.2m	2m
Pinus albicaulis	30cm	50cm	80cm	1.2m	2m
Pinus aristata	15cm	25cm	40cm	50cm	80cm

	Container Class				
Plant	#1	#2	#3	#5	#10
Pinus cembra	30cm	50cm	80cm	1.2m	2m
Pinus contorta var. *latifolia*	30cm	50cm	80cm	1.2m	2m
Pinus flexilis	30cm	50cm	80cm	1.2m	2m
Pinus mugo	15cm	25cm	40cm	50cm	80cm
Pinus nigra	30cm	50cm	80cm	1.2m	2m
Pinus ponderosa	30cm	50cm	80cm	1.2m	2m
Pinus sylvestris	30cm	50cm	80cm	1.2m	2m
Pseudotsuga menziesii var. *glauca*	30cm	50cm	80cm	1.2m	2m
Thuja occidentalis 'Wareana'	30cm	50cm	80cm	1.2m	2m

Table T-12-67: Equivalent Plant Sizes / Container Classes - Deciduous Shrubs

Specify plant size only for plant sizes larger than those shown.

Plant	Container Class			Plant	Container Class		
	#1	#2	#3		#1	#2	#3
Acer shrub form	30cm	50cm	80cm	*Kerria*	30cm	50cm	60cm
Amelanchier	30cm	50cm	80cm	*Kolkwitzia*	30cm	50cm	60cm
Azalea	20cm	30cm	50cm	*Ligustrum*	30cm	50cm	80cm
Buddleia	20cm	30cm	50cm	*Magnolia*	20cm	40cm	60cm
Callicarpa	25cm	40cm	50cm	*Philadelphus*	30cm	50cm	60cm
Cercis	39cm	50cm	80cm	*Physocarpus*	30cm	50cm	60cm
Chaenomeles	20cm	30cm	40cm	*Potentilla*	20cm	30cm	40cm
Chimonanthus	25cm	40cm	50cm	*Prunus* shrub forms	20cm	40cm	50cm
Clethra	25cm	40cm	50cm	*Rhus*			
Cornus shrub form	30cm	50cm	80cm	typical	30cm	50cm	1.0m
Corylopsis	20cm	30cm	40cm	low growing	25cm	40cm	60cm
Corylus	30cm	50cm	60cm	*Ribes*			
Cotinus	30cm	50cm	80cm	upright	50cm	60cm	80cm
Cotoneaster				low growing	30cm	40cm	60cm
upright	30cm	50cm	80cm	*Rosa*	25cm	40cm	60cm
low growing	20cm	30cm	40cm	*Salix* shrub forms	30cm	40cm	60cm
Daphne	15cm	25cm	40cm	*Sambucus*			
Deutzia	30cm	40cm	50cm	typical	30cm	40cm	60cm
Elaeagnus	30cm	50cm	60cm	low growing	20cm	30cm	40cm
Enkianthus	30cm	40cm	50cm	*Sorbaria*	30cm	50cm	80cm
Euonymus	20cm	30cm	50cm	*Spiraea*			
Exochorda	20cm	40cm	50cm	typical	30cm	40cm	60cm
Forsythia	40cm	60cm	80cm	low growing	20cm	30cm	45cm
Fuchsia	20cm	40cm	50cm	*Stephanandra*	20cm	30cm	40cm
Hamamelis	40cm	60cm	80cm	*Syphoricarpus*	15cm	30cm	50cm
Hibiscus	20cm	40cm	50cm	*Syringa*	30cm	50cm	80cm
Hippophae	25cm	40cm	60cm	*Tamarix*	20cm	30cm	50cm

Plant	Container Class			Plant	Container Class		
	#1	#2	#3		#1	#2	#3
Hydrangea				*Vaccinium*	40cm	50cm	60cm
typical	30cm	50cm	80cm	*Viburnum*			
low growing	25cm	40cm	50cm	upright	40cm	60cm	90cm
dwarf	20cm	30cm	40cm	low growing	20cm	50cm	70cm
Hypericum	20cm	30cm	40cm	*Weigelia*	30cm	50cm	80cm

All modifications to Table T-12-7 came from Herman and Quan, 2006 and Knowles, 2003.

	Container Class		
Plant	#1	#2	#3
Berberis koreana	20cm	30cm	50cm
Berberis poiretii	20cm	30cm	50cm
Berberis x 'Sheridan Red'	20cm	30cm	50cm
Caragana arborescens	30cm	50cm	80cm
Caragana frutex	30cm	50cm	80cm
Caragana jubata	30cm	50cm	80cm
Caragana pygmaea	30cm	50cm	80cm
Cornus alba	30cm	50cm	80cm
Cornus rugosa	30cm	50cm	80cm
Cornus sericea	30cm	50cm	80cm
Cornus stolonifera	30cm	50cm	80cm
Cotoneaster adpressus	20cm	30cm	40cm
Cotoneaster integerrimus	30cm	50cm	80cm
Cotoneaster lucidus	30cm	50cm	80cm
Cotoneaster racemiflorus	30cm	50cm	80cm
Cotoneaster rotundifolius	20cm	30cm	40cm
Cotoneaster submultiflorus	30cm	50cm	80cm
Cotoneaster tomentosus	30cm	50cm	80cm
Cytisus ratisbonensis	15cm	25cm	40cm

	Container Class		
Plant	#1	#2	#3
Daphne cneorum	15cm	25cm	40cm
Daphne mexereum	15cm	25cm	40cm
Elaeagnus commutata	30cm	50cm	80cm
Euonymus alatus	20cm	30cm	50cm
Euonymus bungeanus	20cm	30cm	50cm
Euonymus europaeus	20cm	30cm	50cm
Euonymus nanus	20cm	30cm	50cm
Euonymus verrucosus	20cm	30cm	50cm
Eyonymus maackii	20cm	30cm	50cm
Forsythia ovata	40cm	60cm	80cm
Forsythia x 'Meadowlark'	40cm	60cm	80cm
Genista lydia	20cm	30cm	50cm
Genista tinctoria	20cm	30cm	50cm
Halimodendron halodendron	20cm	30cm	50cm
Hippophae rhamnoides	25cm	40cm	60cm
Hydrangea arborescens 'Grandiflora'	30cm	50cm	80cm
Hydrangea paniculata 'Grandiflora'	30cm	50cm	80cm
Lonicera caerulea var. *edulis*	30cm	50cm	80cm
Lonicera korolkowii 'Zabelii'	30cm	50cm	80cm

	Container Class		
Plant	#1	#2	#3
Lonicera maackii	30cm	50cm	80cm
Lonicera maximowiczii var. *sachalinensis*	30cm	50cm	80cm
Lonicera spinosa var. *Albertii*	30cm	50cm	80cm
Lonicera tatarica	30cm	50cm	80cm
Lonicera x 'Freedom'	30cm	50cm	80cm
Lonicera x *brownii*	30cm	50cm	80cm
Lonicera x *xylosteoides*	30cm	50cm	80cm
Mahonia aquifolium	25cm	40cm	60cm
Ononis spinosa	15cm	25cm	40cm
Philadelphus coronarius	30cm	50cm	60cm
Philadelphus lewisii 'Waterton'	30cm	50m	60cm
Physocarpus opulifolius	30cm	50cm	60cm
Potentilla fruticosa	20cm	30cm	40cm
Prunus besseyi	20cm	40cm	50cm
Prunus fruticosa	20cm	40cm	50cm
Prunus japonica	20cm	40cm	50cm
Prunus tenella	20cm	40cm	50cm
Prunus tomentosa	20cm	40cm	50cm
Prunus triloba	20cm	40cm	50cm
Prunus x 'Prairie Almond'	20cm	40cm	50cm
Prunus x *cistena*	20cm	40cm	50cm
Prunus x *nigrella* 'Muckle'	20cm	40cm	50cm
Rhamnus alnifolius	20cm	40cm	50cm
Rhamnus frangula	20cm	40cm	50cm
Rhus aromatica	30cm	50cm	1.0m
Rhus trilobata	30cm	50cm	1.0m
Rhus typhina	30cm	50cm	1.0m

	Container Class		
Plant	#1	#2	#3
Ribes alpinum	50cm	60cm	80cm
Ribes odoratum	50cm	60cm	80cm
Ribes oxycanthoides	50cm	60cm	80cm
Rosa blanda	25cm	40cm	60cm
Rosa foetida	25cm	40cm	60cm
Rosa gallica	25cm	40cm	60cm
Rosa rubrifolia	25cm	40cm	60cm
Rosa rugosa	25cm	40cm	60cm
Rosa species	25cm	40cm	60cm
Rosa spinosissima	25cm	40cm	60cm
Salix brachycarpa 'Blue Fox'	30cm	40cm	60cm
Salix exigua	30cm	40cm	60cm
Salix interior	30cm	40cm	60cm
Salix lanata	30cm	40cm	60cm
Salix purpurea 'Gracilis'	30cm	40cm	60cm
Sambucus canadensis	30cm	40cm	60cm
Sambucus nigra 'Aurea'	30cm	40cm	60cm
Sambucus racemosa	30cm	40cm	60cm
Shepherdia canadensis	20cm	30cm	45cm
Sorbaria sorbifolia	30cm	50cm	80cm
Spiraea x *arguta*	30cm	40cm	60cm
Spiraea x *billiardii*	30cm	40cm	60cm
Spiraea x *bumalda*	20cm	30cm	45cm
Spiraea x *vanhouttei*	30cm	40cm	60cm
Spirea japonica	20cm	30cm	45cm
Spirea media sericea	30cm	40cm	60cm
Spirea trilobata	30cm	40cm	60cm

	Container Class		
Plant	#1	#2	#3
Syringa meyeri	30cm	50cm	80cm
Syringa oblata var. *dilitata*	30cm	50cm	80cm
Syringa reticulata	30cm	50cm	80cm
Syringa velutina	30cm	50cm	80cm
Syringa villosa	30cm	50cm	80cm
Syringa x chinensis	30cm	50cm	80cm
Syringa x hyacinthiflora	30cm	50cm	80cm
Syringa x josiflexa	30cm	50cm	80cm
Syringa x persica	30cm	50cm	80cm
Syringa x prestoniae	30cm	50cm	80cm
Syringa x swegiflexa	30cm	50cm	80cm
Tamarix pentandra	20cm	30cm	50cm
Viburnum dentatum	40cm	60cm	90cm
Viburnum lantana	40cm	60cm	90cm
Viburnum opulus	40cm	60cm	90cm
Viburnum sargentii	40cm	60cm	90cm

Table T-12-~~7~~8: Equivalent Plant Sizes / Container Classes - Vines and Creepers

Specify plant size only for plant sizes larger than those shown. All vines and creepers shall be staked except as specified otherwise.

All modifications to Table T-12-8 came from Herman and Quan, 2006 and Knowles, 2003.

Plant	Container Class		
	#1	#2	#3
Actinida	50cm	60cm	75cm
Akebia	50cm	60cm	75cm
Campsis	50cm	60cm	75cm
Celastris	50cm	60cm	75cm
Clematis	50cm	60cm	75cm
Hedera	50cm	60cm	75cm
Hydrangea	30cm	40cm	50cm
Jasminum	25cm	40cm	60cm
Lonicera	50cm	60cm	75cm
Parthenocissus	50cm	60cm	75cm
Polygonum	50cm	60cm	75cm
Wisteria	50cm	60cm	75cm

	Container Class		
Plant	#1	#2	#3
Celastrus scandens	50cm	60cm	75cm
Clematis x jackmannii	50cm	60cm	75cm
Clematis ligusticifolia	50cm	60cm	75cm
Clematis macropetala	50cm	60cm	75cm
Clematis recta	50cm	60cm	75cm
Clematis tangutica	50cm	60cm	75cm
Clematis verticillaris	50cm	60cm	75cm
Clematis x	50cm	60cm	75cm
Clematis alpina	50cm	60cm	75cm
Clematis viticella	50cm	60cm	75cm
Euonymus fortunei	-	21cm	25cm
Humulus lupulus	50cm	60cm	75cm
Lonicera x brownii	50cm	60cm	75cm
Parthenocissus quinquefolia	50cm	60cm	75cm
Vitis riparia	50cm	60cm	75cm
Wisteria macrostachya	50cm	60cm	75cm

Table T-12-8~~9~~: Equivalent Plant Sizes / Container Classes - Groundcovers

*Asterisk or insertion of plant size indicates usual container classes. Plant sizes are not normally specified except as noted below.

Plant	Container Class / Plant Sizes			Plant	Container Class / Plant Sizes		
	#SP3	#1	#2		#SP3	#1	#2
Ajuga	*	*	-	*Liriope*	*	*	-
Arctostaphylos				*Lonicera*			
low growing var.	*	20cm	-	low growing var.	*	25cm	40cm
Arenaria	*	-	-	*Ophiopogon*	*	*	-
Asarum caudatum	*	*	-	*Pachysandra*	*	*	-
Cornus canadensis	*	*	*	*Paxistima*	*	*	-
Cotoneaster				*Phlox*	*	*	-
low growing var.	*	*	-	*Polygonum*			
Epimedium	*	*	-	low growing var.	*	*	-
Euonymus				*Rosa*	*	30cm	40cm
low growing var.	*	*	*	*Rubus*	*	*	-
Fragaria	*	-	*	*Sedum*	*	*	-
Gaultheria	*	*	-	*Sempervivum*	*	*	-
Genista	*	*	-	*Thymus*	*	*	-
Gunnera				*Vaccinium*			
low growing var.	*	*	-	low growing var.	*	*	*
Hypericum				*Vinca*	*	*	*
low growing var.	*	*	-				

All modifications to Table T-12-9 came from Herman and Quan, 2006 and Knowles, 2003.

	Container Classes		
Plant	#1	#2	#3
Aegopodium podagraria	*	20cm	*
Anemone sylvestris	*	*	*
Antennaria plantaginifolia	*	*	*
Arctostaphylos rubra	*	20cm	*
Arctostaphylos uva-ursi	*	20cm	*
Bergenia cordifolia	*	20cm	*
Cornus canadensis	*	*	*
Coronilla varia	*	20cm	*
Cotoneaster adpressus	*	*	-
Cotoneaster rotundifolius	*	*	-
Cytisus pilosa	*	30cm	40cm
Cytisus purpureus	*	30cm	40cm
Daphne cneorum	*	30cm	40cm
Duchesnea indica	*	*	*
Euonymus obovatus	*	*	*
Festuca ovina	*	20cm	*
Galium odoratum	*	*	*
Hedera helix	*	20cm	*
Juniperus communis	*	30cm	40cm
Juniperus horizontalis	*	30cm	40cm
Juniperus procumbens	*	30cm	40cm
Juniperus sabina	*	30cm	40cm
Lotus corniculatus	*	*	*
Mahonia repens	*	20cm	*
Pachysandra terminalis	*	*	-

	Container Classes		
Plant	#1	#2	#3
Paxistima canbyi	*	*	-
Paxistima myrsinites	*	*	-
Phlox borealis	*	*	-
Polygonum cuspidatum	*	*	-
Potentilla tridentata	*	*	*
Prunus pumila	*	30cm	40cm
Rhamnus alnifolius	*	30cm	40cm
Rosa arkansana	*	30cm	40cm
Sedum kamtchaticum	*	*	-
Sedum spurium	*	*	-
Vinca herbacea	*	*	-
Vinca minor	*	*	-

12.1.13. Grasses

1. Ornamental grasses are usually sold as plugs, or in SP3, #1, or #2 containers but are also available in larger sizes and can be specified as such.

12.1.14. Perennials and Miscellaneous

1. Perennials are usually specified in SP3 or #1 containers but are available in larger sizes.

12.1.15. Equivalent Plant Sizes / Container Classes

Table T-12-9 to Table T-12-11: Equivalent Plant Sizes/Container Classes shows the minimum plant dimension (height or spread) for a variety of conifers, deciduous trees and shrubs that are native to ~~British Columbia~~. Manitoba.

Table T-12-910: Equivalent Plant Sizes / Container Classes - Native Conifers

Native conifers shall have single leaders, natural shape, even branching from the ground, good colour, no indication of nutrient deficiency and be substantially free of pests and diseases.

All modifications to Table T-12-10 came from Shaw, 2011 and Government of Manitoba, n.d.

Plant	Container Class		
	#1	#2	#3
Abies lasiocarpa	20cm	30cm	50cm
Abies spp.	30cm	50cm	80cm
Chamaecyparis nootkatensis	30cm	50cm	80cm
Juniperus commutata	20cm	30cm	-
Juniperus horizontalis	10cm	15cm	-
Juniperus scopulorum	30cm	50cm	80cm
Larix laricina	30cm	50cm	80cm
Picea glauca	25cm	40cm	80cm
Picea sitchensis	30cm	50cm	80cm
Pinus contorta contorta	30cm	50cm	80cm
Pinus contorta latifolia	30cm	50cm	80cm
Pinus monticola	30cm	50cm	80cm
Pinus ponderosa	30cm	50cm	80cm
Pseudotsuga menziesii	30cm	50cm	80cm
Taxus brevifolia	20cm	30cm	50cm
Thuja plicata	40cm	60cm	80cm
Tsuga heterophylla	30cm	50cm	80cm
Tsuga merentsiana	25cm	40cm	50cm

	Container Class		
Plant	#3	#5	#10
Abies balsamea	80cm	1.2m	2m
Larix laricina	80cm	1.2m	2m
Picea glauca	80cm	1.2m	2m
Picea mariana	80cm	1.2m	2m
Pinus banksiana	80cm	1.2m	2m
Pinus resinosa	80cm	1.2m	2m
Pinus strobus	80cm	1.2m	2m
Thuja occidentalis	80cm	1.2m	2m

Table T-12-~~10~~11: Equivalent Plant Sizes / Container Classes - Native Deciduous Trees

Native deciduous trees shall have natural shape and good structure, good colour, and show no indication of nutrient deficiency, and be substantially free of invasive plants, pests, and disease.

Division into multi-stem shall be at soil level or up to 30cm (12in).

All modifications to Table T-12-11 came from Government of Manitoba, n.d.

Plant	Container Class		
	#1	#2	#3
Acer circinatum	30cm	50cm	80cm
Acer glabrum	30cm	50cm	80cm
Acer macrophyllum	40cm	60cm	1.2m
Alnus rubra	40cm	60cm	1.2m
Alnus sinuata	30cm	55cm	80cm
Arbutus menziesii	15cm	35cm	75cm
Betula papyrifera	40cm	60cm	1.2m
Cornus nuttallii	30cm	50cm	80cm
Crataegus douglasii	30cm	50cm	80cm
Fraxinus latifolia	40cm	60cm	1.2m
Malus fusca	30cm	50cm	80cm
Populus tremuloides	40cm	60cm	1.2m
Populus trichocarpa	40cm	60cm	1.2m
Prunus emargnata	30cm	50cm	80cm
Prunus virginiana	30cm	50cm	80cm
Quercus garryana	15cm	35cm	75cm
Rhamnus purshiana	30cm	50cm	80cm
Salix spp.	40cm	60cm	1.2m
Sorbus sitchensis	30cm	50cm	80cm

	Container Class		
Plant	#3	#5	#10
Acer negundo	80cm	1.2m	2m
Betula papyifera	1.2m	2m	3.3m
Celtis occidentalis	80cm	1.2m	2m
Fraxinus nigra	1.2m	2m	3.3m
Fraxinus pennsylvanica var. *subintegerrima*	1.2m	2m	3.3m
Ostrya virginiana	80cm	1.2m	2m
Populus balsamifera	1.2m	2m	3.3m
Populus deltoides var. *deltoides*	1.2m	2m	3.3m
Populus deltoides var. *occidentalis*	1.2m	2m	3.3m
Populus grandidentata	1.2m	2m	3.3m
Populus tremuloides	1.2m	2m	3.3m
Prunus americana	80cm	1.2m	2m
Quercus macrocarpa	75cm	1.0m	1.6m
Salix amygdaloides	1.2m	2m	3.3m
Sorbus decora	80cm	1.2m	2m
Tilia americana	80cm	1.2m	2m
Ulmus americana	1.2m	2m	3.3m

Table T-12-~~11~~12: Equivalent Plant Sizes / Container Classes - Native Shrubs

Native shrubs shall be single or multi-stem and as characteristic of the species with evenly distributed foliage, free of invasive plant, pests, and diseases, and showing no indication of nutrient deficiency.

Division into multi-stem, or branching, shall occur at no more than 20cm (8in) above soil level.

Plant	Container Class					
	#1 No. of Stems	#1 Height	#2 No. of Stems	#2 Height	#3 No. of Stems	#3 Height
Amelanchier alnifolia	1	30cm	2	50cm	3	80cm
Ceanothus sanguineus	2	20cm	3	40cm		
Cornus sericea	2	30cm	3	50cm	3	80cm
Corylus cornuta	1	20cm	2	40cm	3	60cm
Holodiscus discolor	3	25cm	3	50cm	3	70cm
Lonicera involucrata	3	30cm	3	50cm	3	80cm
Mahonia aquifolium	1	20cm	2	40cm	3	50cm
Myrica gale	2	30cm	2	40cm	3	50cm
Oemleria cerasiformis	1	20cm	2	40cm	2	50cm
Pachistima myrsinites	2	20cm	3	40cm	3	50cm
Philadelphus lewisii	2	30cm	3	50cm	3	60cm
Potentilla fruticosa	3	20cm	5	30cm	5	40cm
Physocarpus capitatus	2	25cm	3	50cm	3	60cm
Rhododendron albiflorum	1	10cm	2	20cm		
Rhododendron macrophyllum	1	15cm	1	30cm	2	50cm
Rhus glabra	1	25cm	1	40cm	1	60cm
Ribes sanguineum	2	50cm	2	60cm	3	80cm
Rosa gymnocarpa	2	25cm	3	40cm	3	60cm
Rosa nutkana	2	25cm	3	40cm	3	60cm
Rosa pisocarpa	2	25cm	3	40cm	3	60cm
Rosa woodsii	2	25cm	3	40cm	3	60cm
Rubus parviflorus	2	20cm	3	40cm	3	60cm

Plant	Container Class					
	#1 No. of Stems	#1 Height	#2 No. of Stems	#2 Height	#3 No. of Stems	#3 Height
Rubus spectabilis	2	25cm	3	50cm	5	60cm
Sambucus caerulea	1	20cm	2	30cm	3	40cm
Sambucus racemosa	1	30cm	2	40cm	3	60cm
Shepherdia canadensis	2	20cm	3	40cm	5	60cm
Spiraea douglasii	3	30cm	3	40cm	5	60cm
Symphoricarpos albus	3	15cm	3	30cm	5	50cm
Vaccinium parviflorum	1	20cm	2	40cm	3	60cm
Vaccinium ovatum	2	20cm	2	40cm	3	60cm

All modifications to Table T-12-12 came from Government of Manitoba, n.d.

	Container Class					
Plant	#1 No. of Stems	#1 Height	#2 No. of Stems	#2 Height	#3 No. of Stems	#3 Height
Acer spicatum	1	30cm	2	50cm	3	80cm
Alnus rugosa	1	25cm	1	40cm	1	60cm
Amelanchier alnifolia	1	30cm	2	50cm	3	80cm
Amorpha canescens	1	20cm	2	40cm	3	60cm
Amorpha fruticosa	1	20cm	2	40cm	3	60cm
Amorpha nana	1	20cm	2	40cm	3	60cm
Cornus alternifolia	1	30cm	2	50cm	3	80cm
Cornus racemosa	1	30cm	2	50cm	3	80cm
Corylus americana	1	30cm	2	50cm	3	60cm
Corylus cornuta	1	20cm	2	40cm	3	60cm
Crataegus chrysocarpa	1	30cm	2	50cm	3	60cm
Diervilla lonicera	2	20cm	3	40cm	5	50cm
Eleagnus commutata	1	30cm	2	50cm	3	60cm
Juniperus communis		15cm		30cm		50cm
Juniperus horizontalis		15cm		30cm		50cm

	Container Class					
Plant	#1 No. of Stems	#1 Height	#2 No. of Stems	#2 Height	#3 No. of Stems	#3 Height
Prunus americana	2	20cm	3	40cm	5	50cm
Prunus pensylvanica	2	20cm	3	40cm	5	50cm
Prunus pumila besseyi	2	20cm	3	40cm	5	50cm
Rhus glabra	1	25cm	1	40cm	1	60cm
Ribes americanum	2	50cm	2	60cm	3	80cm
Rosa aricularis	2	25cm	3	40cm	3	60cm
Rubus idaeus	2	20cm	3	40cm	3	60cm
Shepherdia argentea	2	20cm	3	40cm	5	60cm
Sorbus decora	2	50cm	2	60cm	3	80cm
Sorbus sericea ssp. *sericea*	1	20cm	2	40cm	3	60cm
Spirea alba	3	15cm	3	30cm	5	50cm
Symphoricarpos albus var. *pauciflorus*	3	15cm	3	30cm	5	50cm
Symphoricarpos occidentalis	3	15cm	3	30cm	5	50cm
Thuja occidentalis		15cm		30cm		50cm
Viburnum lentago	1	20cm	2	40cm	3	60cm
Viburnum rafinesquianum	1	20cm	2	40cm	3	60cm
Viburnum trilobum	1	20cm	2	40cm	3	60cm

CHAPTER FIVE

CONCLUSION

CONCLUSION

A national standard is beneficial to a profession when it contains recommendations on topics and issues that are common place in the industry. The CSLA/CNLA's National Standard, released in 2016, is designed to be nationally applicable, with appendices to speak to some of the differences between the regions, as is the case for the container grown plants section (rewritten in Chapter 5 to respond to Manitoba's plant palette), which varies from region to region.

However, in some cases there are topics that are regionally specific and that have the potential to be added as a new section. Unfortunately the document/appendix structure does not allow for entirely new sections of the document to be written in response to regionally specific conditions. While it is completely feasible for these regionally specific documents to exist as stand-alone recommendations, they are not as widely recognized if they do form part of the larger body of work. These stand-alone documents have a tendency to be put "on-the-shelf" and forgotten about quite quickly, or, if they are used for a period of time, they generally do not have a committee or structure in-place to ensure their longevity through regular updates.

One such example of this in Manitoba (or more specifically, in the regional context of the prairies) is the inclusion of a native grassland re-seeding performance specification. This is an issue that is almost solely relevant to the prairie region, however it extends from the southern edge to the far northern borders of the prairie provinces. Significant amounts of research have been done on the best ways of reintroducing native grasslands to compromised environments, and there are some individuals and/or firms in Manitoba that specialize in this type of work. While there is relevant, but outdated, work available on the topic, such as *Restoring Canada's Native Prairies* by John Morgan (Morgan, 1995), there has never officially been a standard backed by a nationally recognized association, that specifies the well-researched and tested re-seeding methods.

Another example of regionally specific landscape practices in Manitoba is the standardization of composting. In 2012 Manitoba's Green Dragon's Lair, a local tribute to the well-known television series, The Dragon's Den, gave 'Braggin' Dragon' awards to five projects presented at the Manitoba Environmental Industries Association's annual meeting. Of these five awards, two were given to Manitoba enterprises involved in new technological composting initiatives.

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The first was to a group named the Compo-Stages Manitoba Services Co-op Inc. (CSMSC), a collective of southern Manitoba livestock producers who have invested in a modified machine that composts animal manure so that local farmers can spread it on their fields. This modified procedure reduces the amount of compost necessary to achieve the same benefits as traditional manure spreading by as much as 60 percent (Rance, 2012).

The second award for composting, and the overall competition winner, was a Winnipeg-based company by the name of Overton Environmental Services which has developed an aerated compost tea (ACT). Overton works with local food producers such as Simplot (a major potato supplier) to use their bad or not needed produce, turning what would otherwise be waste into a local soil supplement. This formula is made from "… night crawler castings, high-grade compost, kelp, humic and fulvic acids with the addition of bio-activator compounds" (Rance, 2012) which is used as a high-grade fertilizer for many local golf courses, as well as community lawns and gardens. According to Overton's website, their 'Eco-Tea™' is "specially brewed to create a balanced ecosystem within the soil" (Overton, 2013).
Outside of these examples, composting has

been gaining popularity across the province and has led to the industry recognizing the need for regulations and standards. In 2011, Gerry (Gérard) Dubé started the Manitoba Composting Association Corporation (MCAC) while operating a significant composting facility in La Broquerie, Manitoba. Since then, Dubé has expanded his facility to become an addition of the Brady Landfill in Winnipeg. The organization has been working towards promoting the use of composting as well as creating guidelines based on local research and testing results (MCAC, 2011).

On the national platform, the Canadian Council of Ministers of the Environment produced a document in 2005 titled the Guidelines for Compost Quality (CCME, 2005) in which they outline various categories, elements, approved levels of foreign matter, and contaminants in compost creation. Much like the CSLA/CNLA National Landscape Standards document, this CCME publication was created in partnership with the Bureau de normalization du Québec (BNQ) and the Canadian Food Inspection Agency (CFIA) to ensure a level of consistency and flexibility across the country. And much like the National Landscape Standards document, the guideline has recommendations for regional conditions and issues.

CONCLUSION

While most national standards, in one way or another, make variances for regional context, overall the documents really do not capture the realities of working at a local level. One way to allow for regional specific information to be included in a national standard would be as a supplemental document provided by the same governing body that produced the original standard. In the case of the National Landscape Standard this would be the CSLA/CNLA. These supplements could fit within the structure of the original document and may only be sent to practitioners located in regions where such information would be useful.

The challenge in writing this type of document is finding experts in each field who are willing either to sit on the National Standard's regional committees and lead the writing process, or to act as a leader for an additional sub-committee focused on only writing one supplemental chapter of the National Standard. The number of sub-committees this could potentially form is quite large and could become unmanageable and the work of some sub-groups has the risk of never achieving completion.

The benefits of national standards clearly outweigh the disadvantages, however as the Canadian National Landscape Standard continues to grow and is more widely adopted, the National Standards Committee may have to review its approaches to regional supplements. This could lead to restructuring of the geographic boundaries of their regional definitions, or to create a structure in which each province or territory is responsible for their own specific supplements. In future updates, perhaps each one of the member firms structured within both the CSLA and CNLA's national umbrella will undertake more of the writing for local requirements.

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