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Workshop Agreement on Assessing the Need for a Snow and Ice Management Standard of Canada

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This list reflects those individuals that provided consent to have their names and organizations represented in this Workshop Agreement. Note that additional representation was in attendance; however is not reflected in this list as consent was not provided in time for publication.

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Foreword

Requests for new standards can originate from a variety of sources and stakeholders. For example, safety organizations, trade/industry associations, or government departments often identify a need for a standard and submit a proposal to CSA Group for consideration. With the assistance of knowledgeable experts, CSA Group evaluates the overall relevance of a potential standard in meeting that need and assesses the level of support from relevant stakeholders.

In the fall of 2020, stakeholders in the Canadian snow and ice management industry approached CSA Group with a request to consider the development of a national standard on snow and ice management. Stakeholders identified three key reasons to support their request: (a) ensuring public and worker safety, (b) rising liability and insurance costs, and (c) managing risk from snow and ice management practices to nearby ecosystems. CSA Group agreed that the proposal had merit for further investigation; noting that National Standards of Canada (NSC) are not developed to specifically address stakeholder liability and insurance costs but are one tool that might assist in mitigating these considerations for stakeholders.

To further define the need for a NSC on snow and ice management, CSA Group initiated a scoping review and stakeholder consultation process in early 2021. This process included a series of key informant interviews in May 2021, and a virtual workshop held in June 2021. This workshop agreement (a) synthesizes and summarizes what was learned from stakeholders who participated in the consultation process, and (b) provides a roadmap for consideration in potentially moving forward on the creation of a Snow and Ice Management NSC.

Executive Summary

Background and Context

In the fall of 2020, stakeholders in the Canadian snow and ice management industry approached the CSA Group with a request to consider the development of a national standard on snow and ice management. Stakeholders identified three key reasons to support their request: (a) ensuring public and worker safety, (b) rising liability and insurance costs, and (c) managing risk from snow and ice management practices to nearby ecosystems. CSA Group agreed that the proposal had merit for further investigation, noting that National Standards of Canada (NSC) are not developed to specifically address stakeholder liability and insurance costs but are one tool that might assist in mitigating these considerations for stakeholders. In light of the issues identified and the diverse stakeholders involved with this subject area, CSA Group determined that a stakeholder consultation process was a necessary first step to assess whether a standards-based solution was appropriate. The overall goals of the consultation were to collect stakeholder feedback to (a) help determine the market, societal need, and feasibility of a Canadian standard on snow and ice management, and (b) assess the level of diverse stakeholder support for a Canadian standard. This workshop agreement (a) synthesizes and summarizes what was learned from stakeholders who participated in the consultation process, and (b) provides a roadmap for consideration in potentially moving forward on the creation of a Snow and Ice Management NSC.¹

1.2 Consultation Process

The stakeholder consultation process included a series of key informant interviews conducted in May 2021 and a virtual workshop held in June 2021.

1.2.1 Key Informant Interviews

A total of twelve individuals were interviewed as key informants representing contractors, industry experts, manufacturers and suppliers, building owners and property managers, environmental organizations, government agencies, the accessibility community, and nursery and landscaping associations. The majority of those interviewed represented organizations with a national mandate. Prior to the interview, each key informant was provided with some background information on the project's objectives, copies of other relevant documents/standards on the topic of snow and ice management, and the list of interview questions (which is provided in [Appendix A](#)).

Key informants identified four key issues and risks facing the industry:

- 1. Liability:** Snow and ice management contractors are required to bear all the liability for slips and falls on properties they service. Due to the rising number of slips and falls, fewer companies are willing to offer insurance to contractors in this sector and the cost of obtaining insurance from companies willing to provide it has dramatically increased.
- 2. Training and Competency:** Because there are no formalized requirements for contractors to meet a minimum level of training and/or competency, there is a lack of consistency between operators, many of whom are “fly-by-night” operators who don't provide a consistent and professional level of service.

¹ The scoping review project focused on the snow and ice management industry for non-public facilities (driveways, parking lots, sidewalks, and etc.) and not on the snow and ice management industry for public roads (highways and city).

- 3. Environmental Impacts:** The overuse of rock salt is creating significant environmental impacts to surrounding ecosystems, particularly freshwater systems. This overuse is influenced by a lack of understanding about the science of salt, and some fundamental misconceptions about the conditions under which rock salt optimally performs.
- 4. Regulatory Framework(s):** There are significant safety and environmental concerns associated with snow and ice management practices. While there are regulatory frameworks at the federal, provincial, and territorial levels to protect worker safety, the key informant interviewees did not identify a statutory framework that specifically regulates what the industry must do to protect the environment or the safety of the public.

There was a general consensus among the key informants that there is a need for a standards-based solution and that a NSC could help to address many of the issues and risks faced by the industry. Key informants also felt that a NSC could allow for the establishment of minimum standards of snow accumulation which, in turn, would create an opportunity for the industry to engage with and educate both the public and property managers. Such an opportunity could initiate an open a dialogue about whether it is realistic to have expectations of clear, dry pavement (i.e., zero snow tolerance) in a northern climate during winter conditions.

Key informants identified the following as areas in need of standardization: i) procurement; ii) business operations (including pre-season assessments, documentation of services performed “in event”, monitoring and reporting “post-event”, and ensuring the needs of the accessibility community are appropriately considered); iii) salt management plans (including a science-based “leading practices” approach for salt use, the role of ground temperatures in determining rates of salt application, equipment calibration, monitoring and tracking salt usage, the use of alternatives to salt); and, iv) education, training and minimum competency requirements. There was general agreement that if a standard were to be developed, it should: (a) be drafted so that the requirements could be applied and audited by the end-user; and (b) include a requirement for qualified individuals to undertake refresher training every 3-5 years (should personnel certification become an option with training providers).

1.2.2 Virtual Workshop

The workshop provided an opportunity for 17 invited stakeholders to validate the findings of the key informant interviews and to provide input on the need for, and the perceived value of, a standards-based solution (including potential scope and application). To accomplish this, the agenda was structured to include plenary presentations, polls, moderated breakout sessions, and opportunities for the small-group discussions to report back in the plenary.

1.3 Summary of Key Outcomes

1. There was a general consensus amongst the key informants and the workshop participants that there is a need for a NSC on snow and ice management in Canada.
2. Most workshop participants were in favour of a single standard (10 of 16 attendees) vs. a suite of standards (6 of 16 attendees).
3. More than half of workshop participants recommended that if a standard were to be developed, it should focus on the science of salt. In addition, approximately one-third of workshop participants recommended that a standard should be developed to provide guidance on level of service.
4. Key informants identified the perceived cost of implementing standard requirements as a potential barrier or challenge that might impede the uptake of a snow and ice management standard. Key informants indicated that provincial/territorial/municipal incentives, as well as buy-in from large snow removal companies and insurance providers, would foster uptake and compliance with a standard. One key informant also noted that it is important that any standard developed be user-friendly – the simpler it is to understand and to follow, the more likely it is that users will adopt and comply.

5. Key informants and workshop participants identified a range of documents that could serve as resources and/or starting points to develop a potential seed document for a Snow and Ice Management NSC.
6. A high-level draft Table of Contents for a potential standard was created based on the input received during the consultation, as well as on the approaches taken in the ANSI snow and ice management standard and in CSA Group management standards (see [Annex E](#)).

Introduction

2.1 Management of Snow and Ice in Canada

In the fall of 2020, stakeholders in the Canadian snow and ice management industry approached CSA Group with a request to consider the development of a National Standards of Canada (NSC) on snow and ice management. Letters in support of the CSA Group undertaking this initiative were submitted by the Manitoba Nursery Landscape Association, Landscape Alberta Nursery Trades Association, Landscape Ontario Horticultural Trades Association, the Rick Hansen Foundation, the Fresh Water Advisory Council, and the Lake Simcoe Region Conservation Authority.

Reasons identified in the stakeholder submissions fell into three principal areas: (a) improving public and worker safety, (b) liability and rising insurance costs, and (c) managing risks to nearby ecosystems.

- **Ensuring public and worker safety:** Slips and falls are the leading cause of injury and injury deaths in Canada and falls on ice are the number one cause of sport or winter injuries [1, 2]. Stakeholder submissions point out that according to the Canadian Institute for Health Information, there were nearly 9,000 hospitalizations due to falls on ice in Canada in 2016-2017 and that the average length of a hospital stay after a fall was 14.3 days, compared to 7.5 days for other medical reasons [2, 3]. The prevalence and health impacts of slips and falls among individuals with mobility issues (e.g., seniors, those who use mobility devices, and the disabled) are of particular concern. There are data, for example, that seniors are at a higher risk of taking a fall and tend to have more serious injuries as a result [1, 4, 5]. Hip fractures are the most common injury sustained in falls and approximately 20-40% of seniors who sustain a hip fracture die within a year [3, 4].
- **Liability and rising insurance costs:** According to a 2021 report by Parachute, falls accounted for \$10.3 billion or 35% of the total costs of injury¹ in Canada in 2018 [1]. Fall-related injuries accounted for the highest costs incurred in all age groups except youth and young adults², with more than



half of the costs being incurred in seniors aged 65 and higher [1]. According to stakeholders in the snow and ice management industry, the high costs associated with slip and fall insurance claims has resulted in increased insurance costs and high deductibles [6]. Stakeholder submissions identify skyrocketing insurance costs, challenges in obtaining competitive insurance premiums, and rising liability rates as key threats to the viability of the many small snow removal businesses that service commercial buildings, parking lots, and related access points.

- **Managing risks to nearby ecosystems:** To reduce slip and fall risks to end-users, operators feel pressure to apply greater amounts of road salt, a solution that stakeholders note is inexpensive for the operator, but an expensive cost to the environment [7]. Stakeholder submissions: (a) note that run-off from melting snow and ice carries substantial risks for nearby ecosystems if road salting is not done correctly; and, (b) draw attention to the damage (environmental and infrastructure) associated with the over-salting of properties.

Stakeholders expressed the view that the creation of a NSC could not only guide contractors in their behaviour,

¹ Total costs include direct healthcare costs and indirect costs to society resulting from lost productivity in the workforce.

² By age group, the cost of falls were as follows: children aged 0-14, \$996 million; adults aged 25-64, \$3.0 billion; seniors aged 65+, \$5.6 billion.

but also be beneficial for insurance companies to consider when rate setting and addressing slip and fall claims. Letters in support of CSA Group undertaking this initiative were submitted by the Manitoba Nursery Landscape Association, Landscape Alberta Nursery Trades Association, Landscape Ontario Horticultural Trades Association, the Rick Hansen Foundation, the Fresh Water Advisory Council, and the Lake Simcoe Region Conservation Authority.

CSA Group agreed that the proposal had merit for further investigation, noting that NSC are not developed to specifically address stakeholder liability and insurance costs but are one tool that might assist in mitigating these considerations for stakeholders. Also, the scoping review project focused on the snow and ice management industry for non-public facilities (driveways, parking lots, sidewalks, and etc.) and not on the snow and ice management industry for public roads (highways and city). To further define the need for a NSC on snow and ice management, CSA Group initiated a scoping review and stakeholder consultation process in early 2021. This process included a series of key informant interviews in May 2021 and a virtual workshop held in June 2021. This workshop provided an opportunity for 17 invited stakeholders to validate the findings of the key informant interviews and to provide input on the guidance needed. This workshop agreement (a) synthesizes and summarizes what was learned from stakeholders who participated in the consultation process, and (b) provides a roadmap for consideration in potentially moving forward on the creation of a Snow and Ice Management NSC.

2.2 Purpose of the Project

The overall goals of the project were to collect stakeholder feedback to (a) help determine the market, societal need, and feasibility of a NSC on snow and

ice management; and (b) assess the level of diverse stakeholder support for a Canadian standard.

The specific objectives of the consultation process were to:

1. Identify a diverse list of stakeholders who could be potentially affected by or interested in a standard on this subject, including key interests of stakeholder groups, and their interest in supporting potential future standards development activities.
2. Engage with stakeholders to identify and confirm the issues and risks facing Canada's snow and ice industry, including those that might procure and use those services, and how standards could help address these issues.
3. Identify how existing standards, leading practices, and guidelines are currently being used in Canada, and what gaps or barriers may exist.
4. Identify what incentives or other elements need to be considered for this initiative to advance (e.g., government policy directives, insurance industry support, complementary training products).
5. Provide initial recommendations on what might be included or excluded in the scope of a potential standard, including a Draft Table of Contents and next steps for the project.

The project's objectives were achieved through the 4-stage process shown in Figure 1.

This report: (a) synthesizes what was learned from stakeholders who participated in the interviews and the workshop; (b) outlines the level of support for a standardization solution; and (c) provides a roadmap for consideration in potentially moving forward on the creation of a Snow and Ice Management NSC.

Figure 1: Key Stages in the Project



2.3 Consultation Process

The consultation process was planned by Joy Weismiller of *Juniper Consulting* and Anya Keefe of *Anya Keefe Consulting*, in collaboration with CSA Group and with the input of the Project Advisory Panel. The goal of the consultation process was to engage in a dialogue with a representative group of stakeholders with relevant expertise on leading practices for ice and snow management in Canada. Two specific objectives of the consultation process were to:

1. Assess the level of support for a national standards-based solution(s) focused on the management of snow and ice in Canada.
2. Provide a diverse range of stakeholders with the opportunity to provide feedback on the proposed solution of the development of a NSC on the management of snow and ice in Canada.

The COVID-19 pandemic precluded a face-to-face consultation; therefore, stakeholder perspectives were gathered via key informant interviews and a virtual workshop.

3 Key Informant Interviews

Key informant interviews were conducted in May 2021. Key informants were identified from a list provided by the Project Advisory Panel. To select potential participants, the following criteria were applied: i) pan-Canadian representation; ii) diversity of perspectives; and iii) coverage across a range of snow and ice management roles. Potential key informants were invited via email to participate, and those who agreed were subsequently contacted to arrange a virtual interview.

3.1 Who was Interviewed

Thirteen individuals were approached to participate in the key informant interviews. In total, 12 interviews were conducted⁴. As shown in Table 1, the 12 individuals interviewed represented contractors, industry experts, manufacturers/suppliers, building owners/property managers, environmental organizations/agencies, the accessibility community, and nursery and landscaping associations. The majority of those interviewed represented organizations with a national mandate. See [Annex A](#) for a list of the key informants and their affiliations.

Table 1: Number of Key Informants Interviewed, by Stakeholder Group and Jurisdiction

Stakeholder Group	N	Jurisdiction	N
Contractor	3	National	8
Industry Expert	1	Alberta	1
Manufacturer/Supplier	1	Ontario	2
Building Owner/Property Manager	1	New Brunswick & PEI	1
Environmental	3		
Accessibility	1		
Industry Association	2		
Total:	12	Total:	12

⁴ One key informant was unable to participate because of illness.



3.2 Structure of the Interviews

Prior to the interview, each key informant was provided with some background information on the project's objectives, copies of other relevant documents/standards on the topic of snow and ice management, and the list of interview questions (see [Annex A](#)). Questions were designed to elicit and gather perspectives on the following: i) the key issues and risks facing the snow and ice management industry in Canada; ii) leading practices in snow and ice management; iii) whether there is a need for a snow and ice management standard in Canada; iv) the potential scope and application of a standard should one be developed; and, v) the potential barriers and facilitators to uptake and implementation of a standard. The core objective of the interviews was to confirm the issues and risks facing the snow and ice industry in Canada – including those that might procure and use these services – and to ascertain whether and how a standard could potentially help address these issues.

Each interview took approximately 45 minutes and was conducted by one member of the project team. The interviews were recorded in Zoom™, transcribed using Otter™ voice meeting note software, and analyzed for common themes using Quirkos™ qualitative data analysis software. Before each interview began, verbal consent was obtained from each key informant that they agreed to participate in the interview, and for the interview to be recorded for transcription and data analysis purposes. Once they provided verbal consent and recording began, the Zoom™ platform also communicated to the interviewee that the meeting was being recorded and asked them to click a button indicating that they provided consent.

3.3 What was Learned

At the beginning of each interview, key informants were asked about the organization they worked with, their role, and their organization's role in the management of snow and ice. These questions led to a discussion of the key issues and risks facing Canada's snow and ice management industry and whether a NSC could help address those issues and risks.

3.3.1 Key Issues and Risks Facing the Snow and Ice Industry in Canada

Key informants identified four key issues and risks facing the industry.

- 1. Liability:** Three primary issues related to liability were identified. Because of how the contracts are written, snow and ice management contractors are required to bear all the liability for slips and falls on properties they service. Due to the rising number of slips and falls, fewer companies are willing to offer insurance to contractors in this sector and the cost of obtaining insurance from companies willing to provide it has dramatically increased. The downstream impact is that some contractors cannot afford the insurance and are leaving the industry.
- 2. Training and Competency:** Several key informants noted that this is an industry with low barriers to entry. Because there are no formalized requirements for contractors to meet a minimum level of training or competency, there is a lack of consistency between operators, many of whom are “fly-by-night” operators who don't provide a consistent and professional level of service.



- 3. Environmental Impacts:** The overuse of rock salt is creating significant environmental impacts, particularly on freshwater systems. This overuse is influenced by a lack of understanding about the science of salt and some fundamental misconceptions about the conditions under which rock salt optimally performs. This lack of understanding, coupled with the perception that more is better, often results in operators laying down (or “hand-bombing”) far more salt than is required.
- 4. Regulatory Framework(s):** There are significant safety and environmental concerns associated with snow and ice management practices. While there are regulatory frameworks at the federal, provincial, and territorial levels to protect worker safety, the key informant interviewees did not identify a statutory framework that specifically regulates what the industry must do to protect the environment or the safety of the public. Inter-jurisdictional differences in the Canadian legal system also means that there are inconsistent statutes of limitations across the country. As a result, in some jurisdictions, individuals have two years less a day to submit a claim for a slip and fall, while in others, it is 60 days. This creates challenges for companies operating in multiple jurisdictions.

3.3.2 Support for a Standardization Solution

There was general consensus amongst the key informants that there is a need for a standards-based solution. When asked whether a NSC could address the issues and risks faced by the industry, there was general consensus.

- 1. Liability:** Key informants felt that having a standards-based approach to both procurement and delivery of services could help operators demonstrate due diligence to those who procure their services, as well as to the legal system should a case end up in court. They also felt that insurance companies might be more likely to provide insurance to an operator that can demonstrate adherence to a NSC. The downstream impacts of a NSC could potentially result in a reduction of insurance costs (if embraced by insurers) and fewer contractors leaving the industry.
- 2. Training and Competency:** Key informants felt that a NSC could set minimum training and competency requirements across the industry and the country. This could help to introduce a level of professionalism, create consistency between operators, and start to address the problems associated with the “fly-by-night” operators. By establishing minimum requirements, a NSC could also possibly support the creation of industry credentialing (i.e., allowing trained individuals to receive trade certification like, for example, a RED SEAL), which might attract more individuals to the industry and help to address labour shortages.
- 3. Environmental Impacts:** Key informants felt that a NSC grounded in scientific principles would establish clear, consistent, and evidence-informed guidelines for when the use of salt is appropriate, when the use of salt is ineffective, and how much salt is required for given winter conditions. A national standard that sets out leading practices for the use of salt could help alleviate the impacts of rock salt overuse on both the environment and infrastructure.

- 4. Regulatory Framework(s):** Some key informants felt that a NSC might lead to better regulatory oversight (i.e., the creation of a professional regulatory body). Others suggested that if a NSC defined what was reasonable, it could establish an objective measure of due diligence.

In addition, key informants also felt that a NSC would allow for the establishment of minimum standards of snow accumulation which, in turn, would create an opportunity for the industry to engage with and educate both the public and property managers. Such an opportunity could commence an open dialogue about whether it is realistic to have expectations of clear, dry pavement (i.e., zero snow tolerance) in a northern climate during winter conditions.

3.3.3 Potential Scope and Application of a Snow and Ice Management Standard

When asked what they thought the potential scope and application of a NSC should be, key informants identified the following as areas in need of standardization:

- procurement, including tendering and contracts
- business operations, including pre-season assessments, documentation of services performed “in event”, monitoring and reporting “post event”, and ensuring the needs of the accessibility community are appropriately considered (i.e., ensuring “meaningful access”);
- salt management plans, including a science-informed “leading practices” approach for salt use, the role of ground temperatures in determining rates of salt application, equipment calibration, monitoring and tracking salt usage, and the use of alternatives to salt; and
- the education, training, and minimum competency requirements for workers engaged in snow and ice management activities.

There was general agreement that if a standard were to be developed, it should: (a) be drafted so that the requirements could be applied and audited by the end-user; and (b) include a requirement for qualified individuals to undertake refresher training every 3-5 years (should personnel certification become an option with training providers).

3.3.4 Resources that Could Be Considered during the Development of a National Standard

Some key informants were familiar with ANSI/ASCA A1000-2014, *System Requirements for Snow and Ice Management Services*. In addition to the ANSI standard, key informants identified the following documents as resources that could be considered during the development of a standard:

- **Accredited Snow Contractors Association** (ASCA) annual certification process and courses for documenting work, improving internal company standards, managing and reducing risk.
- **Government of Canada's** *Code of practice for the Environmental Management of Road Salts & the pollution prevention provisions of the Fisheries Act*.
- **Minnesota Snow and Ice Control** “*Field Handbook for Snowplow Operators*” (also referred to as the Green Plow Standard)
- **New Hampshire Department of Environmental Services** Green SnowPro Certification.
- **Ontario Good Roads Association** “*Good Practices for Winter Maintenance in Salt Vulnerable Areas*”.
- **Snow and Ice Management Association (SIMA)** practices, standards, and checklists for: i) creating a snow and ice management plan; ii) sustainable salt use; and iii), for procurement of snow services (including guidelines for creating quality RFPs and a 52-week visual timeline for snow service procurement).

Several key informants also mentioned the leading practices document created by the Canadian Nursery Landscape Association but noted that it is not presently publicly available.

3.3.5 Perceived Barriers and Facilitators to Uptake of a Snow and Ice Management Standard

Perceived barriers: Key informants identified the perceived cost of implementing standard requirements as a potential barrier or challenge that might impede the uptake of a snow and ice management standard.

Perceived facilitators: Key informants indicated that provincial/territorial/municipal incentives, as well as buy-in from large snow removal companies and insurance providers, could potentially foster uptake and implementation of the standard. One key informant also noted that it is important that any standard developed be user-friendly – the simpler it is to understand and to follow, the more likely it is that stakeholders will implement the requirements of the NSC.

4 Virtual Workshop

A three-hour virtual workshop was convened on June 17, 2021. The over-arching objective of the workshop was to build on the findings of the key informant interviews by engaging the participants in a deeper discussion about the kind of guidance needed for snow and ice management in Canada.

4.1 Who Attended the Workshop

The workshop provided an opportunity for 17 invited stakeholders to validate the findings of the key informant interviews, and to provide input on the need for and the perceived value of a standards-based solution (including its possible scope and application). Of the 17 attendees, seven were members of the Project Advisory Panel, eight were key informants, one was an alternate sent by a key informant who was unable to attend, and one was an individual who had agreed to be a key informant but was unavailable due to illness. In addition, the workshop was attended by three observers from the CSA Group, three moderators from the CSA Group, and two external consultants.

As shown in Table 2, the 17 individuals⁵ who attended the workshop represented contractors, industry experts, manufacturers/suppliers, building owners/property managers, industry associations and Environment and Climate Change Canada. Due to scheduling conflicts, none of the key informants who represented the accessibility community or environmental organizations were able to attend the workshop. The majority of those who attended represented organizations with a national mandate.

Table 2: Number of Workshop Attendees, by Stakeholder Group and Jurisdiction

Stakeholder Group	N	Jurisdiction	N
Contractor	6	National	8
Insurance Provider	3	Multi-jurisdictional ¹	2
Industry Expert	1	British Columbia	1
Manufacturer/Supplier	2	Alberta	1
Building Owner/Property Manager	1	Ontario	5
Environmental (Federal Government)	1	New Brunswick & PEI	1
Industry Association	4		

¹Ontario, Alberta, Nova Scotia, British Columbia

⁵ Although 17 individuals attended the workshop, the table shows a total of 18 as one individual represented two different stakeholder groups.

4.2 Structure of the Workshop

The goal of the workshop was to validate the findings of the key informant interviews and to gather additional information to determine if support for a standards-based solution existed. To accomplish this, the agenda was structured to include plenary presentations, polls, moderated breakout sessions, and opportunities for small-group discussions to report back in plenary (see [Annex B](#)).

Two brief high-level presentations set the stage for the workshop. The first summarized the findings of the key informant interviews and the second provided a brief description on what a standard is and the benefits that standards offer. Participants were then introduced to the topics of discussion for the three breakout groups. To maximize opportunity for feedback, the breakout sessions were organized as a virtual wandering flip chart exercise. Participants built on each group's answers and the feedback provided on the three topics of discussion was recapped at the end of the session.

4.3 What was Learned in the Workshop

4.3.1 Poll on the Most Important Issue Facing the Industry

During the presentation on the key informant interview findings, workshop participants were polled to identify what, in their opinion, was the most important issue or risk facing the snow and ice management industry in Canada. Four response categories were provided: liability, training and competency, environmental impacts, and regulatory impacts.

Of the 17 workshop attendees, 16 participated in the poll. Seven (44%) selected liability as the most important issue facing the industry, while six (37%) selected environmental impacts, and three (19%) selected training and competency.

A CSA staff member explained that standards are voluntary unless referenced in regulation, and that the topic of addressing liability is beyond the scope of any standards development activity (although it could potentially be identified as a down-stream benefit of having a NSC).

4.3.2 Poll on Resources that Could Help Inform the Development of a Standard

During the workshop, participants were shown a list of the resources identified by the key informants (see [2.3 Consultation Process](#)) and were asked whether there were any additional resources that should be added to the list. Six participants offered suggestions to supplement the list of resources identified by key informants. All the resources suggested by key informants and workshop participants have been consolidated into a single list that is appended to this report (see [Annex C](#)).

4.3.3 Breakout Sessions

As previously noted, workshop attendees were broken out into three breakout sessions for small group discussion on the following topics:

- a. buying of snow services;
- b. selling of snow services; and
- c. the use of salt and other environmental concerns

These topics were selected based on the feedback from key informants on what the potential scope and application of a national standard should be.

4.3.3.1 Breakout session A - Buying snow services

The goal of Breakout Session A was to learn more about the buying of snow services. Participants were tasked with considering the following overarching question: *"If a standard were developed, what guidance for the buying of snow services should be included?"* To assist participants with answering the question, the moderator was provided with additional prompts that listed the kinds of guidance provided in other available standards and guidelines (see [Annex D](#)).

Participants identified the following issues during Breakout Session A:

- **Request for Proposal (RFP) Process/Procurement:** Some participants noted that during the RFP process, property owners might not disclose all the information that contractors require to make (a) informed decisions that factor in the entirety of the

work, or (b) an accurate estimate of cost. Key issues such as scope of work, level of service, liability (i.e., who bears liability, limits of liability), accessibility, quality of equipment, method, and frequency of reporting (i.e., digital vs. paper logs) were discussed as items that should be addressed during the procurement stage.

- **Terms and Conditions – Scope of Work:** It was commented that the scope of work needs to be clearly set out as part of the procurement and negotiation processes. For example, all parties need to have a clear understanding of the site-specific requirements, snow removal protocols, monitoring protocols, call-back requirements, and the buying cycle. Site-specific requirements should be determined by a site analysis conducted at each location by the vendor and the site manager. Based on the assessment, a site map should be generated that clearly marks out salt storage areas, snow pile placement areas, drainage locations, any problem areas or obstructions (i.e., elevation differences), accessibility locations, and any other priority areas. The scope of work should also clearly set out a process for ensuring that the needs of the elderly and people with disabilities or mobility issues are met (for example, prioritizing the clearing of ramps instead of stairs).
- **Terms and Conditions – Level of Service:** The expected and agreed-upon level of service needs to be clearly set out as part of the procurement and negotiation processes. Participants noted that many property owners have expectations that are difficult for contractors to meet. For example, despite contractors having to deal with multiple sites, there is an expectation that contractors are available to provide continuous site-specific service. These challenges could be addressed by clearly articulated triggers for service (i.e., minimum thresholds of snow accumulation, frequency, and timing of service). In addition, it was suggested that there needs to be a process for managing the overuse of rock salt and other ice melting materials that pose a risk to both infrastructure and the environment. The use of these materials needs to be based on science.

- **Vendor Qualifications:** Participants noted that many contractors don't fully understand leading practices. Embedding a training component into any standard that is developed could help to ensure consistency and quality of work and demonstrate that contractors have the necessary knowledge. It was observed that the outsourcing or subcontracting of work to contractors who lack the necessary knowledge and competency should be addressed in the RFP/ procurement process.

4.3.3.2 Breakout Session B – Selling Snow Services

The goal of Breakout Session B was to learn more about the selling of snow services. Participants were tasked with considering the following overarching question: *“If a standard were developed, what guidance for the selling of snow services should be included?”* To assist participants with answering the question, the moderator was provided with additional prompts that listed the kinds of guidance provided in other available standards and guidelines (see [Annex D](#)).

Participants identified the following issues during Breakout Session B:

- **Procurement:** Participants discussed some of the issues associated with a competitive bidding process (e.g., temptation to cut corners in order to submit the lowest bid).
- **Terms and Conditions – Liability and Other Contractual Issues:** Some participants indicated that service providers should not have to assume 100% liability for incidents after service and identified that service providers have a need to have a recognized standard to reference for due diligence purposes. Other contract-related issues raised included invoicing on time (in compliance with the contract), and monthly contracts vs. year-round contracts (including summer and winter maintenance).
- **Terms and Conditions – Scope of Work and Level of Service:** It was commented that the contract should set out reasonable – and reasonably achievable – expectations for both scope of work and level of service. Examples identified by the

participants included response times, removal protocols, an understanding of how salt and brine solutions work, risk management targets, shared responsibilities (e.g., surveillance of the property and monitoring the site), adoption of new technologies (i.e., electronic monitoring), managing environmental concerns at each location, and taking environmental factors (such as micro-climates) into consideration. Participants discussed the importance of doing a pre-season inspection with the property owner, allowing for hazards and problem areas around the property to be identified in advance, equipment needs to be accurately assessed (which will ensure that contractors have the needed equipment available), and a good site map to be created. In addition, contractors need to have a strategy for dealing with these issues (i.e., drainage, condition of parking areas, wind across open areas, dump areas for snow).

- **Vendor Qualifications:** Participants identified a need for training and education of contractors and owners, as well as the public. They also put forward suggestions for a designation for property managers and certification for contractors' crews. Other issues raised included the use of sub-contractors by some companies, utilization of roaming crews, and the temptation to cut corners when margins are low.

4.3.3.3 Breakout Session C - Managing the use of salt and other environmental concerns

The goal of Breakout Session C was to learn more about salt management and to identify any other environmental concerns associated with snow and ice management. Participants were tasked with considering the following overarching question: *"If a standard were developed, what guidance should it include on the management of salt and other environmental concerns?"* To assist participants with answering the question, the moderator was provided with additional prompts that listed the kinds of guidance provided in other available standards and guidelines (see [Annex D](#)).

Participants identified the following issues during Breakout Session C:

- **Science of Salt:** Participants indicated that having a standard that is informed by the science of salt is

critical. Such a standard should include information on the science of salt (what it is, how it works, when it is effective, when it is not, role/impact of weather variables), types of equipment used for de-icing applications (including calibration of equipment, ground speed controllers), and the science of alternatives to rock salt (e.g., liquid products).

- **Procurement:** Participants identified key issues related to the use of salt that should be addressed during the procurement process (i.e., purchasing, storage and transport, and operational considerations). It was emphasized that proper salt storage is critical to avoid harm to freshwater/groundwater and other ecosystems. Participants noted that contractor-owner communication is critical and emphasized the importance of defining the degree of responsibility. There is also a financial incentive for business owners to better understand issues related to the usage of salt (i.e., environmental impacts, infrastructure deterioration).
- **Terms and Conditions - Liability and Other Contractual Issues:** Participants noted that concern around potential liability is the main driver for over-using salt in snow and ice management applications. They indicated that there is a direct link between the fear of being sued and the amount of salt used.
- **Terms and Conditions - Scope of Work and Level of Service:** Participants suggested that the expectations of the public and of those procuring snow and ice services are too high (i.e., for black pavement year-round). They noted the importance of pre-season inspections, systems for tracking materials, communication between owners and contractors, and ground temperature for the snow response event. It was communicated that some building owners are supplying appropriate devices to provide information on ground temperature to the contractor.
- **Vendor Qualifications:** Participants noted that there is a lack of knowledge about the science of salt and there is a need for training (of contractors) and education (of customers) about salt usage and new products. Some commented that the training of building managers needs to start at the procurement phase.

- **Equipment:** Participants discussed how different types of equipment influence the amount of salt required (i.e., the use of live edge aids meant cleaner lines and less salt used). Participants identified a need for more guidance and support from equipment manufacturers, noting that contractors need information that will help them understand equipment behaviour, as well as guidance on what process to follow. Examples that came up during the discussion included application manuals, calibration, and materials usage.

4.3.4 Plenary Round Robin

Following the breakout session reports to the larger group, the workshop moderator asked each participant to share (in 60 seconds or less) their answer to the following question: *“If you could recommend the development of one standard related to snow and ice management, what would that standard be and why would you give that topic priority?”*

Of the 17 workshop attendees, nine (53%) recommended the development of a standard that addressed the use of and the science of salt, six (35%) recommended

Table 3: Stakeholders’ Key Reasons for Developing a Salt Standard vs. a Level of Service Standard

Priority Topic	Why is this Topic Considered a Priority for Standard Development
<p>Science of Salt</p>	<ul style="list-style-type: none"> ▪ There are significant environmental impacts from over-use; over-salting damages environment and infrastructure and equipment. ▪ It integrates all aspects of snow and ice management (e.g., procurement, removal, liability, communication). ▪ It covers everything, including accountability for those receiving the salt, those using the salt, and those selling the salt. ▪ There is an enhanced opportunity for public education around the use of salt. ▪ There is a lack of knowledge or guidelines for the correct amount of salt to put down on sidewalks and private parking lots. ▪ Guidance on the correct application rate could potentially reduce liabilities. ▪ The science of salt is something that can be measured. ▪ Salt use affects 70-80% of issues in procurement, selling, environmental impact, training, infrastructure, and salt table. ▪ Addressing it can potentially minimize environmental impact, ensure safety, and consider costs. ▪ A standard could provide a better understanding of the limitations of snow and ice management and what can be achieved using salt.
<p>Level of Service</p>	<ul style="list-style-type: none"> ▪ This could help to manage expectations, integrate the science of salt, and create a level playing field for all players in the industry. ▪ It connects to all aspects of snow management (i.e., training, contracts, liability, salt usage). ▪ It could help to build understanding among customers and end-users of what is involved in snow and ice management. ▪ It could help to address lack of consistency, different budget expectations, equipment usages, training requirements, and define the responsibilities of the various stakeholders involved in snow and ice management. ▪ It could help to define what’s reasonable (minimum requirements) and manage customer expectations (i.e., black asphalt 24/7 is not an achievable level).



the development of a standard that addressed the level of service, one recommended the development of a standard that addressed contractual issues, and another recommended the development of an overarching standard that integrated all aspects of snow and ice management. Table 3 below lists the key reasons given for the two most frequently identified topics.

The participant who recommended an overarching standard expressed the opinion that *“you can’t isolate snow removal to just one segment. A standard should be overarching and encompass all aspects of snow removal; it needs to draw in contractors, building owners, equipment manufacturers, and material suppliers. An overarching standard will reach our overarching goal of making property safer and the environment better.”*

4.3.5 Poll on Development of a Single Standard vs. a Suite of Standards

Before the workshop adjourned for the day, workshop participants were polled one last time to elicit their perspective on whether a single standard or a suite of standards should be developed, should CSA Group pursue a standards-based solution. The following three response categories were provided as options: i) a single standard; ii) a suite of standards; or, iii) a standards-based solution is not needed.

Of the 17 workshop attendees, 16 participated in the poll. Ten (63%) selected a single standard, while six (37%) selected a suite of standards. No respondents said that a standards-based solution is not needed.

5 Summary of Outcomes from the Consultation Process

The following six key outcomes emerged from the consultation process:

1. There was overall agreement amongst the key informants and the workshop participants that there is a need for a NSC on snow and ice management in Canada.
2. Most workshop participants were in favour of a single standard (10 of 16 attendees) vs. a suite of standards (6 of 16 attendees).
3. Just over half of the workshop participants (i.e., 53%) recommended that if a standard were to be developed, it should focus on the science of salt. Approximately one-third of workshop participants (i.e., 35%) recommended that a standard should be developed to provide guidance on level of service. Many of the participants in support of the latter topic felt that such a standard would be all-encompassing and would include issues related to the use of and the science of salt.
4. Key informants identified the perceived cost of implementing standard requirements as a potential barrier or challenge that might impede the uptake of a snow and ice management standard. Key informants indicated that provincial/territorial/municipal incentives, as well as buy-in from large snow removal companies and insurance providers, would foster uptake and compliance with a standard. One key informant also noted that it is important that any standard developed be user-friendly – the simpler it is to understand and to follow, the more likely it is that users will adopt and comply.



5. Key informants and workshop participants identified a range of documents that could serve as resources for consideration in the potential development of a seed document for a NSC on snow and ice management. See [Annex C](#) for the list of suggested resources.
6. A high-level draft Table of Contents for a potential standard was created based on the input received during the consultation from key informants (regarding potential scope and application) and workshop participants (during the breakout sessions), as well as on the approaches taken in the ANSI snow and ice management standard and in CSA Group management standards (see [Annex E](#)).

6 Next Steps

Before the workshop was adjourned, a representative of CSA Group briefly summarized the next steps in the process of evaluating whether or not a NSC would be developed. They are as follows:

1. External contractors will draft and submit the Workshop Agreement to the CSA Group for review and consideration.
2. CSA Group may further consult with the Project Advisory Panel to answer any additional questions.
3. CSA Group will undertake a standards development cost/benefit analysis.
4. If CSA Group decides to proceed with a standards development project, potential funding will be identified and secured.
5. If funding is identified, authorization for a new standard project will be sought from the senior management at CSA Group.
6. If the new standards project is approved to move forward, CSA Group will file a public Notice of Intent with the Standards Council of Canada (SCC) to move forward with the development of a new standard on the subject of snow and ice management.
7. If approved, and following posting of the Notice of Intent with the SCC, CSA Group will issue a public call for participation for a new Technical Committee (TC) on the subject of snow and ice management. A TC would then be established and comprised of balanced representation of technical expertise.

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- [5] Public Health Agency of Canada, "Seniors' Falls in Canada. Second Report.," Ottawa, ON, 2014. [Online]. Available: https://www.phac-aspc.gc.ca/seniors-aines/publications/public/injury-blessure/seniors_falls-chutes_aines/assets/pdf/seniors_falls-chutes_aines-eng.pdf
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Annex A – List of Key Informants

Organization	Jurisdiction	Name	Position
Contractors			
TCG National	Ontario	Jeff Wooldridge	Operations
Strathmore	National	Jessica Milligan	Vice President
Clintar Commercial Outdoor Services	National	Terry Nicholson	Vice President
Industry Expert			
Nextra Consulting	National	Grant Harrison	President
Manufacturer/Supplier			
Ledex Industries	National	Gino Paonessa	President
Environmental			
Lake Simcoe Region Conservation Authority	Ontario	Bill Thompson	Manager, Watershed Plans & Strategies
Accessibility			
Rick Hansen Foundation	National	Brad McCannell	VP, Access Inclusion
Industry Association			
Landscape Alberta	Alberta	Joel Beatson	Chief Executive Officer
Landscape New Brunswick & PEI	New Brunswick & PEI	Jim Landry	Executive Director

This list reflects those individuals that provided consent to have their names and organizations represented in this Workshop Agreement. Note that additional representation was in attendance; however is not reflected in this list as consent was not provided in time for publication.

Annex B – Key Informant Interview Guide

Preliminary questions:

1. Do you consent to participating in this interview for the research we are conducting on the need for an ice and snow management standard in Canada?
2. Do you also consent to an audio recording of this interview for transcription and data analysis purposes? (Remind participants their responses will be treated confidentially – only aggregated information will be reported)

Some background and context before beginning interview:

We've been contracted by the CSA to collect stakeholder feedback to (a) help determine the market, societal need, and feasibility of a Canadian standard on Snow and Ice Management; and (b) assess the level of diverse stakeholder support for a Canadian standard. Our primary goal in conducting these interviews is to confirm the issues and risks facing the snow and ice industry in Canada, including those that might procure and use those services, and to ascertain how a standard could potentially help to address these issues. We are also interested in identifying how existing standards, leading practices, and guidelines are currently being used in Canada and what gaps or barriers might exist, as well as what incentives or other elements need to be considered for this initiative to be successful. We will use the information we learn from these interviews to prepare recommendations for the CSA Group on what might be included or excluded in the scope of a potential standard.

Questions about key informant's role:

3. What organization do you work with and what is its jurisdiction? What is your role there?
Prompt: Who procures and uses your services?

Questions to explore the need for a snow and ice standard

4. What do you consider are the key issues and risks facing the snow and ice industry in Canada?
5. Would a national standard help address those issues and risks? If yes, how?
6. Do you support the need for national ice and snow standard in Canada?
Prompt if yes: what do you think the potential scope and application of a Canadian Standard should be? do you think that the American National Standard we shared with you would be an appropriate starting point for the development of a standard in Canada?
Prompt if no: why don't you see the need for a national standard in Canada?
7. Are there other examples of standards or best practices that you think should inform the development of a Canadian standard?
8. What would need to be in place nationally or at the provincial/territorial level in order for a snow and ice standard to be implemented? (For example, government policy directives, insurance industry support, complementary training products, etc.)
Prompt: What do you think will be a barrier or a challenge to uptake and implementation?
Prompt: What do you think will facilitate uptake and implementation?
9. If the CSA Group were to move forward with developing a snow and ice standard, would you be interested in becoming a participant in the standards development process?
10. Is there anything else you'd like to add or do you have any questions for me?

Annex C – List of Workshop Participants

Name	Organization
Representative Stakeholders	
Chris Draaistra	BC Landscape & Nursery Association
Chris Morrison	Morrison Services
Gerald Boot ¹	Boots Landscaping, Canadian Landscaping & Nursery Association
Gino Paonessa	Ledex Industries
Jeff Wooldridge	TCG National
Jessica Milligan	Strathmore
Jim Landry	Landscape New Brunswick & PEI
Jim Monk	Markham Property Services
Joel Beatson	Landscape Alberta
Jordon Robertson	Nextra Consulting
Mark Jackson	The Insurance Market
Matt Cowley	The Insurance Market
Raqib Omer	Viaesys
Terry Nicholson	Clintar Commercial Outdoor Services
Terry Robertson	TCG National
CSA Group Observers & Moderators	
Candace Sellar	CSA Group
Dave Shanahan	CSA Group
Michael Leering ²	CSA Group
Nancy Bestic ²	CSA Group
Omer Ainanshe	CSA Group
Tania Donovska	CSA Group
External Consultants	
Anya Keefe	Anya Keefe Consulting
Joy Weismiller	Juniper Consulting

¹ Champion for the Project Advisory Panel

² CSA Group Observer

Annex D – Workshop Agenda

Welcome and Introductions

- **Housekeeping** – *Moderator, Joy Weismiller*, Principal, Juniper Consulting
- **Nancy Bestic**, Director, Health and Safety, Standards, CSA Group
- **Omer Ainanshe**, Standards Intern, CSA Group
- **Gerald Boot**, Boot's Landscaping, Project Advisory Panel

Workshop Plenary

- **Presentation:** Insights from Key Informant Interviews, Anya Keefe, Anya Keefe Consulting
- **Presentation:** What is a Standard? Dave Shanahan, Project Manager, CSA Group

Breakout Sessions

- **Session A:** Guidance on Buying Snow Services
- **Session B:** Guidance on Selling Snow Services
- **Session C:** Use of Salt and Other Environmental Concerns

Workshop Plenary

- **Breakout Session Report Back** – All
- **Looking Ahead** – All
- **Next Steps**

Closing Remarks

Annex E – External Resources for Consideration in the Development a Potential Standard

Canadian Resources

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Transportation Association of Canada, "Salt Management Guide – Second Edition," 2013. [Online] Available: <https://www.tac-atc.ca/en/publications>

Transportation Association of Canada, "Syntheses of Best Practices Road Salt Management," 2013. [Online] multiple webpages⁶:

- a. **Chapter 1** (Salt Management Plans) Available: <https://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/roadsalt-1.pdf>
- b. **Chapter 2** (Training) Available: <https://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/roadsalt-2.pdf>
- c. **Chapter 3** (Road, Bridge, and Facility Design) Available: <https://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/roadsalt-3.pdf>
- d. **Chapter 4** (Drainage) Available : <https://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/roadsalt-4.pdf>
- e. **Chapter 5** (Pavement and Salt Management) Available : <https://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/roadsalt-5.pdf>
- f. **Chapter 6** (Vegetation Management) Available : <https://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/roadsalt-6.pdf>
- g. **Chapter 7** (Design and Operation of Maintenance Yards) Available: <https://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/roadsalt-7.pdf>
- h. **Chapter 8** (Snow Storage and Disposal) Available: <https://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/roadsalt-8.pdf>
- i. **Chapter 9** (Winter Maintenance Equipment and Technologies) Available: <https://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/roadsalt-9.pdf>
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International Resources

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Annex F – Additional Prompts Provided to Moderators

Breakout Session A: Buying Snow Services

- Vendor qualification and RFP process
- Terms and conditions
 - Snow-specific Level of Service (i.e., that describes the expected outcomes)
 - Scope of Work, including pre-season inspections and site assessments
 - Minimum contract durations with exit clauses for the parties involved
 - Communication process before, during and after service (including service failure, emergencies or injuries on site, complaints)
 - Contractual terms and conditions, including compensation, service begin/end dates, F/P/T/local regulatory requirements, liability, non-compliance, shared accountability)
- 52-week seasonal cycle/timeline (that lays out timeline for vendor qualification, RFPs, contract negotiation and legal review, begin/end dates for contract services, performance review and monitoring, etc.)

Breakout Session B: Selling Snow Services

- Scope of Work
 - Pre-season inspections and site assessments including detailed site drawings, maps, pictures of property; identifying issues (i.e., obstructions) that could create visibility issues during winter weather; prioritization of major exits and egress routes; determining if there are issues that impact operator access (e.g., locked gates, security areas, etc.) or structures that create adverse conditions when covered in snow and ice (e.g., overhangs across an entrance, speed blocks, parking lot obstructions or slopes); ensuring meaningful access for people with mobility issues
 - Site size, site complexity, services needed (e.g., snow clearing, sidewalks etc.), service definitions, acceptable materials, equipment that is required and/or is unacceptable
- Level of Service
 - Start times (triggers/thresholds)
 - Completion times
 - Extreme weather scenario planning
 - Descriptors of surface conditions

- Terms and conditions (for billing and risk management)
 - Documentation and recordkeeping (i.e., service report)
 - Technology requirements
 - Fee structure (per event vs. per-occurrence vs. per season service vs. time and materials) and fee modifiers
 - Accountability and monitoring (including core performance measures, methods, and metrics)
 - Communication process before, during and after service (including service failure, emergencies or injuries on site, complaints)
 - Contractual terms and conditions, including compensation, service begin/end dates, F/P/T/local regulatory requirements, liability, non-compliance, shared accountability)
- Training requirements
 - Minimum competency
 - Frequency of training, timing of training
 - Preseason safety and refresher training
- 52-week seasonal cycle/timeline (that lays out timeline for procurement of equipment, material and labour; contract negotiation and legal review; training and preparation, etc.)

Breakout Session C: Use of Salt and Other Environmental Concerns

- Local/municipal regulations
- Science of salt (what it is, how it works, when it is effective, when it is not, role/impact of weather variables, alternatives to rock salt)
- Purchasing, storage and transport, operational considerations
 - Organizational policies, documentation & record-keeping
 - Standard operating practices
 - Application rates (what's required based on weather variables, like surface/ground temperature, heavy precipitation, moisture, etc.)
 - Calibration of equipment (flow settings, conveyor/auger and spinner speeds, ground speed, material, etc.)
 - Proximity to freshwater/groundwater sources and to sensitive landscapes
- Training requirements
 - Minimum competency
 - Frequency of training, timing of training

Annex G – High-Level Draft Table of Contents for Potential New Standard

Contents

- I. Snow and ice management foreward
- II. Snow and ice management committee roster
- III. CSA Group committees
- IV. Snow and ice management preface
- V. CSA Group preface
- VI. Summary of changes

1 Scope, purpose, and application

- 1.1 Scope
- 1.2 Purpose
- 1.3 Application

2 Definitions and abbreviations

- 2.1 Definitions
- 2.2 Abbreviations

3 Snow and Ice Management Program

- 3.1 Fundamentals of snow and ice management
- 3.3 Pre-season assessments
 - 3.3.1 Detailed drawing or picture of property
 - 3.3.2 Services to be performed
 - 3.3.3 Potential risk areas
 - 3.3.4 Placement of snow piles
 - 3.3.5 Snow disposal procedures
- 3.4 Documentation of services performed “in event”
 - 3.4.1 Arrival and departure
 - 3.4.2 Conditions at property
 - 3.4.3 Services performed
 - 3.4.4 Areas serviced or not serviced
 - 3.4.5 Incidents occurred

- 3.5 Monitoring and reporting “post event”**
 - 3.5.1 Post-event monitoring
 - 3.5.2 Post-event inspection reporting
- 3.6 Considering the needs of the accessibility community**

4 Salt management plans

- 4.1 Legal and other requirements**
- 4.2 Science-based “best practices” approach for salt use**
 - 4.2.1 Storage of salt and deicing materials
 - 4.2.2 Application of salt and deicing materials
 - 4.2.3 Role of ground temperatures
- 4.3 Equipment calibration, monitoring and tracking salt usage**
- 4.4 Use of alternatives to salt**

5 Roles and responsibilities

- 5.1 Roles and responsibilities of those who procure the services**
- 5.2 Roles and responsibilities of those who sell the services**

6 Competence & training

- 6.1 Minimum competency requirements**
- 6.2 Service provider training**
- 6.3 Property manager training**
- 6.4 Verification of training**
- 6.5 Periodic assessment**
- 6.6 Refresher training**

7 Management review & continual improvement

- 7.1 General**
- 7.2 Continual improvement**
- 7.3 Review input**
- 7.4 Review output**

CSA Group

CSA Group is a global organization dedicated to safety, social good and sustainability. We are a leader in Standards Development and in Testing, Inspection and Certification around the world including Canada, the U.S., Europe and Asia. Our mandate is to hold the future to a higher standard.