

SCHEDULE 1 –SCOPE OF WORK

Description of Deliverables

Seneca College is committed to reduce the amount of chloride salts used on our campuses. To mitigate the environmental impact road salt has on the environment, Proponents are to provide a detailed road salt reduction plan that includes alternate ways to reduce chloride (road salt) salts for the term of the agreement.

Schedule 1A – Sustainability

Sustainable Snow / Ice Management

Seneca College is incorporating a salt management plan that will reduce the amount of chloride salts used on our campuses by 50% during the winter of 2021/22 and additional reduction in the following five years.

Road salts are usually defined as the chloride salts of sodium, calcium, magnesium, and potassium, which are the four most common chemicals used for winter maintenance. The environmental impact of road salt use in Canada has been documented in several studies, highlighting the devastating effects of chloride levels due to excessive road salt on species like fish, frogs and mussels in many southern Ontario urban and rural waterways. Some waterways are even as salty as the ocean at their peaks.

Salt Reduction Plan

The College recognizes there is not one single solution to reducing chloride salts (road salt) use while ensuring roads and walkways are ice and snow free during the winter months. However, excessive road salt has a negative impact on the environment and is unsustainable. Road salt washes off the side of roadways and seeps into the ground or nearby waterbodies. This runoff pollutes local watersheds, causes major environmental damage, and has public health implications.

To mitigate the environmental impact road salt has on the environment the Proponent must provide a detailed road salt reduction plan for the term of the agreement. The plan must include alternate ways to reduce road salt used on campus while maintain safe driving and walking surfaces.

The salt reduction plan should include alternatives to road salt use and should include the following:

- Using sweepers, leaf blowers, plow, snow blower
- shovel, sweep
- treated sand/salt
- pre-wetting-adding liquids to solid products
- direct liquide application (DLA)-anti-icing-liquid-brining

The college will close all non essential roads, walkways and paths from November to April. This will result in a 30% reduction of salt and de-icing materials required on campus.

Snow Clearing - Mechanical

Mechanical removal of snow is a key measure for salt conservation. By removing as much snow as possible through plowing, sweeping, snow blowing, etc, requires less road salt to keep the surface

free of snow and ice. The potential for refreeze is minimized, as less snow and ice is available to dilute the applied chemical.

Special attention needs to be directed to areas such as entryways, walkways, and patios where manual application of salt is required, as these have historically received excessive quantities of salt, in part because the salt is not evenly spread across the areas.

Accurate Road Salt Delivery Measuring

By the second year of the agreement, the Successful Proponent must have automated road salt and brining delivery systems that control application rates by vehicle ground speed. To reduce the amount of salt applied, it is recommended that closed loop electronic controllers that measure both truck speed and spreader discharge rates be part of the salt reduction plan.

- Equipment calibration is critical to ensure that the amount of salt or brine targeted for application coincides closely with the actual amount of salt applied.
- Mandatory reports of tracking salt and/or brine applied is required after each snow/ice event

Pre-wetting Road Salt

Pre-wetting is an application method in which a concentrated liquid anti-icing product is added to dry solid salt just before it is applied to the surface of the roadway. The liquid is added either at the chute or at the spinner. Pre-wetting increases the effectiveness of dry road salt, reducing the amount of salt required. The liquid helps the salt stick to the pavement and facilitates melting by speeding the reaction time of dry salt. Pre-wetting should be used where weather and/or road conditions warrant.

Direct Liquid Application (DLA)

Preventing a snow or ice bond to a paved surface is much more efficient than destroying the bond after it has formed, and so preventive strategies should be the top priority. DLA material, such as a brine solution, is applied on all hard surfaces prior to the accumulation of frost, snow or ice, followed by plowing and/or spreading operations where weather and/or road conditions warrant.

The Successful Proponent must have equipment assigned to all college campuses for use prior to, during and after snow/ice events. The preferred method winter maintenance is pre-wetting salt of a brine solution. The Successful Proponent shall be responsible to monitor weather and roadway conditions to determine when the conditions are appropriate for application of DLA. DLA, once applied, can be effective for a period of up to three days if not removed by weather. Weather and roadway conditions (air and surface temperature, precipitation, etc.) will vary within the geographic area and as such, the Successful Proponent shall determine, based on the conditions, where and when DLA shall be applied.

The Successful Proponent shall determine, based on the conditions, the type of material that shall be applied to the surface to make it safe for walking and driving on.

Low-Chloride Materials

A number of alternatives to road salt are now commercially available, including materials that are low in chloride or chloride-free. The Successful Proponent is encouraged to make use of road salt alternatives in order to reduce the amount of chlorides entering the environment.

Supply of Materials

The Successful Proponent must make provisions to ensure that adequate de-icing materials will be available for winter usage. The Successful Proponent shall be responsible for ordering, deliveries, checking, rejecting, breakage, theft, unloading and storage of such materials. Material must be

stored in accordance with Ministry of Environment legislation and in a manner satisfactory to the College.

The Successful Proponent will provide all of the necessary equipment to undertake pre-wetting, brine application, and anti-icing procedures, snow and ice removal. All materials and equipment necessary for the completion of the work shall be supplied by the Successful Proponent.

Efficient Application

The amount of road salt needed to keep parking lots and roads clear of snow and ice can be significantly reduced by using anti-icing (aka; DLA- direct liquid application) and pre-wetting application techniques. Pre-wetting involves coating dry road salt with a liquid before applying it to the pavement. This helps the salt stick to the surface of the parking lot and speeds the melting of the salt, which means less salt is needed to do the same amount of work.

Anti-icing is the practice of applying a liquid (such as salt brine) or pre-wetted de-icer to paved surfaces before the storm arrives. This prevents snow and ice from bonding to the pavement, making them much easier to remove. Anti-icing provides substantial cost savings because less salt is used, and roadway users benefit through a reduction in the potential for accidents during the winter season. On roads, anti-icing has been found to be effective at application rates as low as 100 pounds per lane-mile, which is equal to 1.57 pounds per 1,000 square feet⁵ (refer to Section 7.9.1 Materials Spreading). This is the recommended practice the college is encouraging The Successful Proponent to use on campus.

Standard road salts used for snow and ice control should also meet Ontario Provincial Standard Specifications for moisture content, texture, and chemistry to ensure optimal performance.

Chemical plowing is a common term used to refer to the practice of applying salt on top of a layer of snow in lieu of both plowing and salting. **As a general rule, snow should be plowed prior to salting if more than 1.25 cm has accumulated on the pavement.**