

# Natural Ice Rink Operating Requirements

Community groups are responsible for building, maintaining, and closing Natural Ice Rinks. The following guidelines will assist with these tasks; however, rink location and weather and usage patterns will determine the amount and type of maintenance your rink will require. For safety, **always have at least two people on-site** when building, maintaining and using the rink.

## Building the Rink

### Select the Site

Natural Ice Rinks are most often located on grass, but may also be found on limestone screenings or hard surfaces like asphalt and concrete.

1. Select a flat, level area free of debris and obstructions. Small dips and rises of a few inches can be leveled out with snow before pouring the rink, but an uneven or sloped area will not be a good site for a skating rink. The greater the slope, the higher the perimeter borders will need to be in order to hold the water at the lowest spot.
2. Position the rink close to the designated winter water source. Consider the length of the hoses – you will be flooding (watering) the rink on a regular basis!
3. Where possible, select an area that maximizes available lighting for evening use.
4. Choose a shaded or protected area to help protect the rink from premature melting from sunlight.

### Prepare the Border

Border preparation is required to keep the water contained within the ice rink area.

1. The easiest and cheapest way to build a border is to heap up snow in a 7.5 cm to 12.5 cm (3" to 5") mound around the perimeter of the rink. To hold the average adult, the ice on your rink needs to be at least 7.5 cm (3") thick to avoid cracking.
2. If your budget allows, a plastic liner will keep the water in and level.
3. If your budget allows, a border can be constructed from 5 cm by 10 cm (2" by 4") lumber or large-diameter PVC piping around the rink area.

### Prepare the Base

A Natural Ice Rink will benefit from some snowfall before construction. A white, snow-covered base helps reduce premature melting from sunlight. Dark colours absorb more heat from sunlight and cause the rink to melt faster.

1. Before you create the ice surface itself, start with a 2.5 cm to 5 cm (1" to 2") base of packed snow, which serves as a barrier between the ground and the ice and seals new ice.
2. Spread the snow over the rink area, raking it into a smooth surface and packing it down.
3. Ensure snow is tightly packed. Flooding (watering) across 5 cm (2") or more of unpacked snow will result in soft, lumpy ice and collapsing sections. It will also cause rapid melting during warm spells.

## Building the Ice

### Create the Base Layer/First Coat

To make good quality rink, the ground must be frozen and the air temperature should be at least -4°C (25°F) or colder for at least five consecutive days. The best times to perform flooding (watering) of a

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rink is at night, or in the late evening or early morning. Avoid flooding (watering) during midday when temperatures are at their peak.

1. The base layer/first coat should be very thin. Water flowing from the winter water source typically has a temperature of over 4°C (25°F), which will melt a snow-packed base if applied too heavily. Applying a thin layer of water over the packed snow base will freeze and form a barrier that prevents future water from soaking through to the ground when you flood the rink to make your ice.
2. Checks to ensure that no water is leaking along the borders and escaping from the rink area. Seal up any gaps with packed snow.
3. Do not apply more water until the first coat is completely frozen.
4. Another objective of spraying or flooding the ice surface is to fill in any holes, cracks, or depressions in the base surface and create as smooth and level a surface as possible. To do this, spray the base very lightly with water several times, and allow it to freeze each time before adding more water.

## Spraying Method:

- Use a brass or plastic nozzle to apply water. Do not apply water from an open hose as this will result in poor and uneven water distribution.
- Face the nozzle away from the rink surface when first turning on the water. Once the proper spray pattern from the nozzle has been established, direct the nozzle towards the rink area.
- Spray water while moving the nozzle in a fan-like motion, slightly overlapping the previous pass.
- Spraying water slightly into the air will allow it to slightly cool before hitting the rink surface. Never direct the force of the water downward on the ice.
- Start the water application at the lowest spot, and move across the rink applying a thin spray over the entire surface until wet.
- Avoid keeping the hose on the ice for a prolonged period as it may cut/melt into the ice and result in a poor ice surface. Having a second person to lift and move the hose around is helpful.
- Avoid excessive water buildup in any specific area. Large amounts of water will soak into the ground, melt the frost, and require a re-freeze (which could take several days). If the water takes more than 15 to 20 minutes to freeze, you've put too much water down and should reduce the amount of water in the next application.
- At correct temperatures, the end of the rink you started at will be frozen by the time you finish at the other end.

## Remaining Flooding (Watering)

Once your base layer/first coat is complete, subsequent flooding (watering) is required.

1. Start the water application at the lowest spot, filling very gradually to avoid the buildup of shale ice.
2. Stop the water application when level, and allow enough time for the water to freeze. Remaining flooding (watering) should be done in thin layers, once a day. This allows old and new ice to bond and strengthen. Always make sure the surface is frozen before applying more water.
3. Thoroughly clean the ice surface before each re-flood, so it is free from debris and snow.

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Avoid re-flooding on extremely cold nights (-23°C/-9°F or colder) as the warmer water will crack the ice below and will require repairs to the ice surface.

In about a week or so (or a minimum 7.5 cm/3" of ice), the rink will be ready for use.

## Opening the Rink for the Season

- Prior to opening the rink, ensure proper signage is installed by the Park Supervisor. Signage must be posted and visible at all times.
- Ensure all members have attended a training and orientation session.
- Let the wider community know!

## Maintaining the Rink

Community groups are responsible for all regular maintenance and repairs to the rink, which includes regularly shoveling and flooding (watering) the rink. Weather and usage patterns will determine the amount and type of maintenance your rink will require. Ongoing maintenance will extend the life of your rink and keep the skating surface smooth.

CSA helmets and ice creepers must be worn when flooding (watering) the rink and/or shoveling snow off the ice.

- When snow falls, a simple shoveling with a plastic or vinyl push-style snow shovel is often all that is required.
- Hard use by skaters will chip the ice and may even crack it. To fill in chips and cracks, use a water-snow slush mix as a filler. As it freezes up, use a water bottle or another small smooth surface to level the patched area and allow it to freeze. Then, re-flood the rink.
- Periodically, the rink will need to be re-flooded with additional water. Thoroughly clean the ice surface before each re-flood, so it is free from debris and snow. Avoid re-flooding on extremely cold nights (-23°C/-9°F or colder) as the warmer water will crack the ice below and will require repairs to the ice surface.
- Ensure any rink related garbage is disposed of appropriately.

## Closing the Rink at the End of the Season:

To prevent damage to the park and injury to the public, the rink must be properly closed at the end of the season.

Rinks that are left in place during above-freezing temperatures pose a tripping hazard, drowning hazards, and cause extensive damage to the grass.

To close the rink:

1. Ensure that all water is drained. Breaking up the ice may speed up the melting as well.
2. Remove snowbanks and boards so water can run off easily and evenly away from the rink area.
3. Return the site to its original condition.
4. Inform the Park Supervisor of the removal.

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## Emergencies

For emergencies (e.g., a burst water pipe), please call 311 for further assistance.

## Ice Issues – Troubleshooting Guide

Problem	Cause	Solution
Shale ice	Heavy flooding leaves ponds or pools of water which freeze on top, but the water drains away under the ice surface, leaving air pockets.	Scrape away and expose air pocket. Fill air pocket with a wet snow slush and gradually build up with water.
Frost boils	Excessive water in the soil freezes and expands, causing the ice to heave and crack. Excess water boils out through the cracks and freezes.	Cut out and remove the affected area and gradually build up with water.
Cracked ice	Excessively cold temperatures.	Fill cracks with wet snow slush and flood to even surface.
Rough or pebble ice	Too much snow on ice, or flooding while snowing or ice scrapers are not sharp or flat enough, or too little or too much water per application.	Make sure ice is clean of all snow before flooding. Ensure scrapers are flat and sharp. Ensure correct amount of water is applied.
Chipped ice	Brittle ice from severe cold temperatures.	Flood with water. Frost free water sources usually provide water that is 4°C/39°F.
Low spots on ice	Excessive use in specific areas.	Flood with a pail of water in the evening when there is no planned skating for the next several hours.