

Natural Ice Rink Program Criteria

Locations must:

- be within a City of Toronto park (or previously approved TDSB site)
- have a maintained winter water service (no hydrants or residential sources)
- be on a flat area with good access, proper grading and adequate drainage
- not be immediately next to private home owner property
- have a storage facility or the potential to store equipment on private property (adjacent to a park)
- not already have an artificial ice rink

Community/Neighbourhood Group:

- must have a minimum of six (6) participating members, with two (2) members designated as leaders and the primary contacts for City staff
- members must attend a training and orientation session for any new locations or at the discretion of the Park Supervisor for any existing locations
- members must be 18 years of age or older, due to physical demands required for ice maintenance
- will be responsible for establishing the rink, flooding the ice, snow removal, closing of rink and use
- ensure any volunteers wear a CSA helmet and ice creepers while on the ice at any time and not on skates

The City of Toronto will provide:

- access to winter water service (no fire hydrants or residential water sources), water key, hoses and nozzle
- access to two snow shovels per rink
- access to lighting (where available)
- public signage
- instruction on how to build and maintain a natural ice rink

Boards and “rink in a box”:

- the use of boards are allowed at the Parks Supervisor’s discretion
- boards are to be supplied, installed and stored by the Community/Neighbourhood Group
- boards cannot be higher than 10”
- staking into the ground in any manner is prohibited

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- a plastic liner, or “rink in a box”, is permitted, but in case of thaw, water cannot exceed 2” as this may present a drowning hazard
- fencing off of the Natural Ice Rink is prohibited
- boards may not be set up before December 1st and must be removed and stored by group by no later than April 1

Other materials that may be useful (not provided by City):

- 2"x4" lumber or 3" PVC pipe for ice rink border
- Wide push broom: this may be useful for sweeping snow to edges of the rink
- Garden rake: used for moving snow around during base preparation

Volunteer community groups are responsible for building, maintaining and tearing down/closing Natural Ice Rinks. The following guidelines will assist with these tasks, however rink location, weather and usage patterns will determine the amount and type of maintenance your rink needs.

Safety Considerations

- Water may only be obtained from an approved winter water source (no fire hydrants or residential water sources)
- Never leave a hose running outside, especially into a ditch. The building of ice in a ditch can cause serious flooding during warm spells and cause considerable damage.
- Prior to opening the rink, ensure proper signage is obtained and installed by Parks Supervisor. Signage must be posted and visible at all times of use.
- Ensure all members have received an orientation / training session on proper rink safety and maintenance procedures.
- Having at least two people on-site when maintaining or using the rink is ideal
- Please discuss with Parks Supervisor the date of removal of any rink boards. This must be completed at the discretion of the Parks Supervisor to ensure all trip hazards are removed in a timely manner and the rink drains adequately.
- CSA Helmets and ice creepers must be worn when flooding (watering) the rink and/or shoveling snow off the ice.

Site Selection

- Natural Ice Rinks are most often located on grass and may also be found on limestone screenings or hard surfaces like asphalt and concrete.
- It's best to position your rink where there is convenient access to a designated winter water source. Consider the length of your garden hoses and where you can access a water spigot when planning your rink. You will be flooding (watering) the rink on a regular basis!
- Where possible, select an area that maximizes available lighting for evening use.

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- Look for a flat, level area that is free of debris and obstructions.
- Using a shaded or protected area will greatly help to protect the rink from premature ice melting from sunlight.
- Small dips and rises can be leveled out with snow before you pour the rink, but a very uneven or sloped area will not be a good site for a skating rink.
- Avoid locations requiring more than a 6-inch slope from one side to the other. Many locations are not completely flat, but try to find a location where the slope is no more than a few inches. The greater the slope, the higher the perimeter borders will need to be in order to hold the water at the lowest spot.
- Ice rink borders cannot be higher than 10".

Border Preparation

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

- The easiest and cheapest way to build a border is to heap up snow in a 3" to 5" mound around the perimeter of the rink. Remember that to hold the average adult, the ice on your rink needs to be at least 3" thick to avoid cracking.
- If your budget allows, a plastic liner will keep the water in and level.
- If your budget allows, build a border around the rink area, at least 3" high (it may need to be higher if your location has a slope). Borders made from 2"x4" lumber set on the edge can work, or large-diameter PVC piping can also work.
- When the time comes to start applying water to form ice on the rink, periodic checks should be made to ensure that no water is leaking along the borders and escaping from the rink area. Seal up any gaps with packed snow.

Base Preparation

- A Natural Ice Rink does benefit from some natural snowfall before construction. The natural snowfall used in the base making provides a white colour, which will help reduce premature melting due to sunlight. Dark colours absorb more heat from sunlight energy and will therefore cause the rink to melt faster.
- Before you attempt to create the ice surface itself, it is important to start with a 1" to 2" base of packed snow, which will also serve as a barrier between the ground and the ice and provide a seal for your new layer of ice.
- Spread snow over the rink area, rake it into a smooth surface
- Pack this snow base down firmly and evenly throughout the rink, so it is 1" to 2" thick.
- Flooding (watering) over 5 cm (2 inches) or more of unpacked snow will result in soft, lumpy ice, collapsing sections and cause rapid melting during warm spells.
- CSA Helmets and ice creepers must be worn when flooding (watering) and/or shoveling snow off the ice.

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Ice Making – Watering to form initial base

Before spraying

Once the base and sides are ready, the initial watering can begin.

- For a solid freeze and to make good quality ice, the ground must be frozen and the air temperature should be at least -4°C or colder for at least five consecutive days. Only start this step (watering) once the ground has frozen, since ice can be negatively affected from air temperatures as well as ground temperatures.
- Always use a brass or plastic nozzle to apply water. Do not apply water from an open hose since this will result in a poor and uneven distribution of water
- Always 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, then direct the nozzle towards the rink area.
- Start flooding (watering) at the furthest point from the water supply and move across the rink applying light fogs or a thin spray over the entire surface until wet.
- Never direct the force of the water downward at the ice. Spraying water slightly into the air will allow it to slightly cool before hitting the rink surface.
- Do not apply more water until the first coat is completely frozen.
- Try to avoid keeping the garden hose on the ice for a prolonged period of time 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 will be helpful.
- Always drain and roll up the hose when not in use to prevent freezing or damage.
- CSA Helmets and ice creepers must be worn when flooding (watering) and/or shoveling snow off the ice.

Spraying Method

- The first spraying should be very light, because water typically has a temperature of $+4^{\circ}\text{C}$, 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.
- 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 you will need to spray the base very lightly with water several times, and allow it to freeze each time before adding more water.
- The best results are achieved if you take your time and spray thin layers back and forth over the entire rink, rather than allowing water to gather in a large pool in any specific area.

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- Fill low spots very gradually to avoid the buildup of shale ice – a situation where water on the surface freezes, while the water underneath drains away and leaves an air pocket under the ice surface.
- Spray water while moving the nozzle in a fan-like motion, slightly overlapping the previous pass.
- While spraying, try to keep the nozzle moving and work quickly to avoid excessive water buildup in any specific area.
- When properly formed at correct temperatures, the end of the rink you started at will have frozen by the time you finish at the other end. An application across the entire rink must have enough time to freeze, before adding the next layer of water.
- Large amounts of water will draw the frost out of the ground, causing the water to soak into the ground which could mean a delay of several days until the ground re-freezes. If it takes more than 15-20 minutes to freeze, you have put too much water on and should reduce the amount of the next water application.
- When the air temperatures are near freezing, then the water coming out of the nozzle should be a finer spray. As the temperatures drop further below freezing, the spray may be less fine and have larger droplets.
- Always drain and roll up the hose when not in use to prevent freezing or damage.

Ice Making – Flooding (watering) to make thick ice

- Once your frozen base is complete and you are ready to begin the initial flood to make ice, start the water application at the lowest spot.
- Fill low spots very gradually to avoid the buildup of shale ice – a situation where water on the surface freezes, while the water underneath drains away and leaves an air pocket under the ice surface.
- Stop when the water is level and allow a sufficient amount of time for the water to freeze.
- Try to avoid flooding (watering) during the mid-day when temperatures are often at their highest. Often the best times to perform the initial flooding (watering) of a rink is at night, or in the late evening or early morning.
- Always make sure the surface is frozen before applying more water.
- Avoid flooding (watering) on extremely cold nights (-23°C or colder) because the warmer water will crack the ice below and will require repairs to the ice surface.
- Remaining floods should be done in thinner layers, once a day. This allows old and new ice to bond and strengthen.
- In about a week - or a minimum three inches of ice - the rink should be ready for some family fun!

Opening the Rink

- Prior to opening the rink, ensure proper signage is obtained and installed by Parks Supervisor.

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- Ensure all members have received an orientation / training session on proper rink safety and maintenance procedures.

Maintaining the Rink

- Community Groups are responsible for all regular maintenance and repairs to the rink. For emergencies (i.e. burst water pipe) please call 311 for further assistance.
- Please ensure any rink related garbage is disposed of appropriately
- Weather and usage patterns determine how often and what type of maintenance activity the rink requires to maintain a smooth and level skating surface.
- Regularly shovel, maintain and water the rink. It will extend the life of your rink and keep the skating surface smooth.
- Thoroughly clean the ice surface before each flood, so it is free from debris and snow.
- Hard use by skaters will chip the ice and may even crack it. To fill in holes and cracks, use a water-snow slush mix as a filler. As it is freezing 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.
- When snow falls, a simple shoveling with a plastic or vinyl push-style snow shovel is often all that is required.
- Periodically, re-flood the rink with additional water. Avoid flooding (watering) on extremely cold nights (-23°C or colder) because the warmer water will crack the ice below and will require repairs to the ice surface.
- **CSA Helmets and ice creepers must be worn** when flooding (watering) and/or shovelling snow off the ice.
- **Always drain and roll up the hose** when not in use to prevent freezing or damage. Never leave a hose running outside, especially into the ditch, because this can cause serious flooding (watering) problems during warm periods.

Shale Ice

Shale Ice is caused by applying too much water in one application and the top of the water surface freezes, but some water remains under the ice surface. This water then drains away and leaves an air pocket underneath which often looks white like patches. To repair shale ice, chip away at the ice surface to expose the air pocket. Fill the air pocket with slush to patch it and grade/level the area. Apply water to flood the ice and smoothen it off.

Closing the Rink – Required Tasks

- During a prolonged mild spell and/or at season's end please ensure that all water is drained and the site made safe.
- Damage to the grass is a possible problem in the spring, as freezing and thawing occur and water pools on the grass for long periods of time.

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- When the rink starts melting, take measures to speed up melting and draining of the water.
- Snow banks and boards around the edges of the rink should be removed so the water can run off easily and evenly away from the rink area.
- Breaking up the ice may speed up the melting as well.
- **Discuss with Parks Supervisor the date of removal of any rink boards.** This must be completed at the discretion of the Parks Supervisor to ensure all trip hazards are removed in a timely manner.

For emergency repairs at night or on weekends, please call 311 and leave your name, the rink location and the nature of the problem.

Ice Issues – Troubleshooting Guide

Problem	Causes	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 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 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 / too much water per application.	Make sure ice is clean of all snow before flooding. Ensure scrapers are flat and sharp. Ensure correct amounts of water are applied.
Chipped Ice	Brittle Ice from severe cold temperatures	Flood with water. Frost free water sources usually provide water that is 4°C
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