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Create A Winter Wonderland Outdoor Ice Installation and Maintenance

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by Mike Bryson

During winter in Canada it's not uncommon to see a great sheet of ice in every second back yard, and almost every community has at least one outdoor rink. Here are some tips for installing and maintaining a safe, fun outdoor ice surface.

Site selection
Obviously, your chosen site should be on ground that's as level as possible. You can level it off as you build your rink, but the more level to start with, the better. The surface you're building on should promote good drainage in the spring and not be a dark color, such as asphalt, because dark colors absorb heat.

Water supply
Make sure there is an adequate water supply close at hand. If you don't have a controlled water supply, the next best alternative is a stream or pond from which you can pump water.

Lighting
To maximize usability, lighting is a must. It's been my experience that at least 80 percent of outdoor rink use is after school hours, and with the days being so much shorter during the winter, you'll need lighting.

Surface area
Make sure that you have enough room for your ice surface. The area should be 180-200 feet long and at least 80-85 feet wide. You can use the area for other activities in the off-season.

Ancillary facilities
You will need access to facilities for your patrons. If it's not in the budget the first year, renting portable restrooms might suffice temporarily.

Parking
Many communities forget about parking for their patrons. If there isn't enough parking, people will park on side streets and this will make local residents angry.

Rink orientation
The rink should be set so that the long axis runs north-south. This will minimize the amount of melting that occurs when the sun reflects off the boards.

Surface preparation
o If it's grass, cut it as short as possible.
o If it's a hard surface, clean off all gum, oil and dirt.
o Before applying water, fill cracks around the base of the boards with paper towels, strips of rags or other filler material.
o When the weather starts growing cold, start freezing the ground with a sprinkler. This will form a good frost to minimize melting during warmer weather.
o If there is snow on the ground, pack it down and use it for your base. The white snow will reduce

the amount of heat the ground will absorb from the sun and it will give your ice a whiter appearance throughout the season. This will also cut down on painting costs.

Flooding

The correct way to flood is to apply water in small amounts through a hose or spray nozzle so the water freezes on the surface and ice is built up slowly. Several fine sprays should be applied before proceeding to a heavier spray. If the weather is cold enough, i.e., 0°F to 10°F, spraying can likely be continuous as the first coat will be frozen almost immediately. However, in warmer weather, additional sprays should not be applied until the previous one is thoroughly frozen. Once the ground has been completely sealed, the water will not run off. Then leveling of the ice can begin using a heavier spray. Repeat the previous procedure, applying as many coats as necessary to build up a level ice surface. Care must be taken during this leveling process to ensure the low spots are filled in gradually, as shell (shale) ice may result if too much water is applied at once. If some spots are particularly low, it may be best to apply water only to those spots until they are built up close to level.

During the flooding process, a number of precautions must be taken with the hose:

o Keep the hose on dry ice; if the hose is dragged over wet ice it will push water with it and ridges will be formed.

o Keep the hose moving so the warmer water running through the hose does not melt the hose into the ice.

o Ensure connections are tight and the hose does not leak.

o Do not leave a running hose unattended on the ice surface. It's helpful to have a second person, who can manage the excess hose. If you are alone, the hose can be difficult to drag around. A way to minimize the workload is to wrap nylon rope around the hose and secure it with duct tape. This allows the hose to slide more easily; it also keeps the hose above the ice and eliminates melting.

When most of the rink is level and covered with an adequate surface of ice, skating can be allowed. Skating will create a whitening effect on the ice surface, either in place of or in addition to actually painting the ice. It's extremely important that there is adequate ice at this point to ensure safety of your patrons.

Ice maintenance

The first step in preparing the ice for the re-flooding is to sweep the snow and chippings away from the boards, as the scraper will not get all of the snow away from the boards. If this snow is left, it will build up and form a concave and rough edge.

The rest of the ice surface should be scraped using a steel scraper.

For flooding during the operational day, use a barrel flooder containing water heated to approximately 135°F. Cold water does not work as well in barrel flooders as they tend to freeze up.

At the end of the operating day, the ice surface should be inspected. If necessary, a heavier flood should be completed with a hose.

If the weather is very cold, care must be taken to not get too much water on at one time as it will run and freeze in a ripple. Also, in severely cold weather the ice will crack if flooded with too much water. A very light spraying should overcome this problem. A warm water application will prevent cracking, melt the remaining snow on the ice and spread over a greater distance.

Some ice makers suggest that when the temperature is less than 0°F the ice should not be flooded as too much cracking will result.

How often a rink should be flooded will depend on usage. Some rinks will need to be flooded at the end of every day, while others may require flooding only once per week.

Common Ice Maintenance Problems

Problem	Possible Cause	Possible Repair
Shell or shale ice	Heavy flooding; leaving ponds of water that freeze on top and run away	

underneath Scrape away and fill with wet snow, or gradually build up with warm 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 the boil, fill with wet snow and gradually build up with warm water.
Cracked ice Cold temperatures Fill with slush and flood.
Pebble or rough ice Too much snow on ice; flooding while snowing; scrapers are not flat or not sharp enough; using too little water; if it ripples, you are using too much water. Make sure the ice is clear of all snow before flooding. Repair/sharpen scraper or blades or use warmer water. Make sure you are applying the correct amounts of water.
Ice chipping Brittle ice from severe cold weather Flood with warm water.
Spring deterioration Warm weather or painted lines absorbing the sun's rays either from direct exposure or from the reflection off the boards. Do not allow skating. Place snow on melting areas, as a thicker layer of ice will help prevent melting in warm weather. You can also try to bank snow up against the outside of the boards throughout the season; this will have an insulating effect in the warm weather.
Low spots on the ice Excessive use in goal crease, behind net, at players' boxes, etc. Flood with a pail of water in the evening after all the patrons have left.

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