



— ONTARIO —
SPEED SKATING
— ASSOCIATION —

Facility Guidelines

Ensuring a Safe and Quality
Skating Environment

Spring 2015

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SHORT TRACK FACILITY GUIDELINES

Marking the Track

Paint

Two companies provide paint products that work well for marking the track. Jet Ice (www.jetice.com) and Ice Co. (www.icecoadvanced.com).

Each arena paints its own hockey lines and should be approached to paint the tracks at the same time. About 12 ounces of each paint color per track color will be required. Ask arena managers about using their own paint.

To lay the track when ice is in place, drill 3/8th of an inch deep then lay the paint.

Blue, red, and yellow paints are standard colors and can be blended to create additional colors for 5 tracks.

If you need assistance, please contact a neighboring club about marking the track.

Track Diagrams

Speed Skating Canada provides diagrams for marking the track (100m and 111.12m). Visit their website at <http://www.speedskating.ca/appendices> (refer to Appendix C).

A track survey certificate is required to validate accuracy. Without a certificate, race results may not be accepted and potential provincial records will not be recognized.

OSSA suggests:

When skating on North American size ice, it is recommended that 3 tracks are marked for the 111m and 100m.

When skating on Olympic size ice, 5 tracks can be accommodated for the 111m and 100m tracks.

Prior to any competitive event, the host club should advise the Chief Referee and Facility Manager of the tracks being used. This should occur 2-3 weeks prior to an event.

It can be challenging to distinguish between the 100m and 111m tracks when both have been marked. Some clubs have alleviated this issue by marking large dots for one track and smaller dots for the other.

Ice Maintenance

Ice Quality and Temperature

Speed Skating requires hard, cold ice - harder than figure skating and hockey. Determine optimal ice surface temperature for your arena. Talk to elite skaters from your club and have them tell you when they think the ice feels good or fast. Most Ontario arenas will likely find -6°C to -10°C to be ideal.

Ice thickness is very important. A flat surface with uniform thickness is a better surface than one with great variations. The amount of water put down by track stewards will have an effect. Where possible, scrape the track prior to the flood to remove the non-bonded cold bucket water and ensure a flat ice surface.

Ice technicians are responsible for creating a safe ice surface for every user. If you do not believe the ice is safe, speak to the ice technicians and they will work to improve the conditions. Should your practice session follow a group of heavy users (ex: midget or junior hockey), request a heavy flood or a second flood if there are visible ruts. The ice technicians may be frustrated by this but they will also know that you take safety seriously.

- Ice technicians should temper the ice at least once per month.
- Keep the ice clean free from all debris, tires washing everyday not just for events.
- Keep the ice slab 1 inch to 1.25 inches thick. This allows the slab temperature to change quickly when required.
- The top half inch is most important and hot floods will help create a resilient surface.
- Maximize the temperature of flood waters up to 180°F which helps ensure there is little oxygen in ice.
- Determine the amount of time required to reduce slab temperature by one or two degrees.
- An ice monitoring chart has been created – see page 8 and Appendix A.
- Monitor humidity levels and ensure dehumidification systems are clean and running efficiently. Humidity levels of 45% -50% are good for Ontario arenas.
- Monitor interior building temperatures. Temperatures in the arena can increase during meets with spectators or light coming through the arena windows. If the temperature in the building is causing the ice to soften, limit any extra heat sources such as audience heaters.
- Frequent floods during long practices or during competitions is essential to maintain the ice.
- Reduce the amount of water added to the track during competitions. Only fill water buckets half-way as cold water from buckets does not bond well to ice formed with hot water
- Monitor the ice surface temperature, the building temperature, the exterior building temperature and the humidity during practices and competitions to determine when ice brine temperatures should be adjusted to maintain surface temperature.
- Work with the ice technicians to determine if the facility is able to alternate compressors to help maintain consistency of the ice surface temperature.
- Some communities have started using a filtering system such as reverse osmosis. This provides a nice slab but can lack some minerals that hold the ice together for short track. If reverse osmosis water is used, try to keep a minimum of 85ppm.

Additional Considerations for a Competition

About three weeks prior to a competition, meet with the arena manager to discuss the ice.

Request the following of the arena manager:

- 1) Ask if it's possible to have the ice technician temper the ice.
- 2) Cut the ice down to about 1 inch thickness.
- 3) Build up the ice to 1.25 or 1.5 using the hottest flood water possible.

Monitor the ice surface temperature during practices and ask elite skaters for their opinions about the ice—comments like fast, too soft, or breaking away. Provide comments back to the ice technicians so they can determine the optimal temperature for your ice slab.

The track should be laid about a week prior to competition so ice has time to form over the paint.

An organized and efficient group of volunteers is integral to hosting a successful meet and maintaining quality ice:

Four (4) track stewards are required on the ice surface during meets (two at each end). One track steward should be experienced and provide direction for other stewards.

At least two (2) water attendants are required off-ice for filling buckets during the event.

At least two (2) squeegees are required – one at each end of the arena.

Holes in the ice need to be filled and sealed quickly during meets. A snow bucket must be at rink side for quick access by the track stewards. Pack the hole with snow, apply some water to help level off the top, and bond with surrounding ice. A fire extinguisher (carbon dioxide) can be used to expedite sealing the hole. It can take up to 10 minutes for the ice to be repaired so track stewards should adjust their track sequence accordingly.

Resurfacing the Ice

Prior to any competitive event, the host club should consult with the Chief Referee and Facility Manager to discuss the resurfacing schedule. This should occur 2-3 weeks prior to an event. This will allow the Chief Referee to plan out the entire meet in advance, make maximum use of the ice during the event, and ensure ice quality is maintained.

Find out who will be your ice machine driver during the competition and encourage them to practice the flood patterns for your practice sessions, leaving in the safety track, short track flood one day and full surface floods the next. A capable ice technician is a great asset to ensure the event operates as smoothly and efficiently as possible.

Flood Patterns

Track Flood (approx. 12 minutes)

Dry Scrape: The ice machine driver does the dry scrape in the reverse direction of the skaters. The first lap should be done on the outside so the mats and safety track are visible from the driver's side. The driver will then slowly work his way into the dots until he has scraped the entire track one meter inside the dots.

Flood: The first lap is completed in the same direction of the dry scrape so the driver can see the mats and safety track. Then the driver turns around to drive on the inside lane of the track and flood in the direction of the skaters. The driver will then slowly work his way out to the safety track. The center of the track is left un-scraped or flooded.

Quick Track Flood (approx. 8 minutes)

Flood Only: The ice machine driver starts this the same as the dry scrape except this is a flood only. The first lap is in same direction of dry scrape in order to easily see mats and safety track. Then the driver turns around and drives to the inside lane of the track and flood in the direction of the skaters. The driver will then slowly work his way out to the safety track. The center of the track is left un-scraped or flooded.

Surface Flood (approx. 15 -20 minutes)

Dry Scrape: The ice machine driver does a dry scrape in the reverse direction of the skaters. The first lap should be on the outside so that the mats and safety track are visible from the driver's side. The driver completes two laps prior to scraping the entire ice surface with the exception of the safety track. The scrape can be done in any direction and a regular hockey flood pattern is great.

The driver should empty his bucket and top up his wash and flood water prior to the entire surface flood.

Flood: The driver should then proceed to flood the entire surface - starting with two laps in the opposite direction of skaters to ensure the operator can see the mats and safety track. Once first two laps are completed, the driver can do a regular hockey flood pattern with the exception of the safety track. If time permits, an extra track flood would be ideal following the surface flood.

Protective Mats

Clubs should consult the protective mat recommendations put forth by Speed Skating Canada. Practice and competition mat recommendations can be found on their website at <http://www.speedskating.ca/appendices> (refer to Appendix D).

OSSA requires Regional Series short track meets to provide Level 3 mat protection as a minimum requirement.

OSSA requires Provincial Series short track meets to provide Level 3 mat protection as a minimum requirement.

In simple terms, this means that double mats should start at block #2 and end at the blue line or block #7. Mat coverage should go from the start of the corner door (entering the corner) and continue until the center red line (exiting the corner).

Questions about protective mat requirements and specifications can be directed to members of the OSSA Safety Task Group (<http://ontariospeedskating.ca/safety-task/>).

Transportation of mats

Inquire amongst the members of your club to see if they have connections for a small trucking company to help out.

Ensure there are volunteers at each end to load and unload the mats.

Determine the square footage of the mats you will be transporting. This will determine the amount of floor space and the size of truck required.

Become familiar with your needs before booking the truck. You might be able to join other shipments and reduce expenses.

Be mindful of dirt and salt when dragging the mats. Trolleys are recommended.

Plan as far out as possible to avoid last minute charges.

Ice Monitoring Chart

See Appendix A

Clubs can use this chart to monitor ice conditions at their event. The long term benefits of tracking ice temperature are the true benefits of the tool. The short term benefits can be used during the event from AM to PM and is very helpful for two day events.

The chart includes many variables that affect ice quality. If you know which conditions created great ice, it can help you recreate those conditions (and great ice) again. The same can be said for poor conditions - the chart will allow you to have conversations with your ice technician to maximize their skills to provide the best ice possible. It is not necessary to monitor all of these conditions.

Talk with your skaters. If they have a great practice and feel the ice is fast, document the conditions so they may be replicated.

Meeting with your ice technicians at the beginning of the year is helpful. A well placed box of donuts or some club merchandise may go a long way. There are many factors that have an impact on our skaters and encouraging buy in and involvement from the ice technicians will improve ice quality. The ice technicians will take great pride in new skater Personal Bests' or setting club records. Be sure to share the positives even more than the negatives.

Practice using the chart and keep all of your sheets in a folder for future reference. Keep your tracking sheets from practice sessions and events.

During an event, measure ice temperature first thing in the morning, prior to the first flood, and prior to each flood. You will find that the ice temperature varies greatly from the track to the middle of the ice. You will see changes as the day goes on. Share these temperature changes with your ice technician. It is very difficult to lower the ice temperature during the day so it is essential to start with a real cold slab. It is easier to warm up the ice than to cool it down during an event. During a two day event, meet up with the ice technician at the end of Day 1 to figure out if you need to start colder on Day 2.

LONG TRACK FACILITY GUIDELINES

Marking the Track

The composition of unrefrigerated outdoor ice is constantly changing, so paint should not be used to mark the skating track. Paint will bleed with warmer temperatures and cannot be removed from the ice. Blue, red, and green poker chips and black nylon strapping are good substitutes.

Choose a day with pleasant temperatures and no precipitation to establish the track. You will need a cordless drill, 1.5 inch bit for drilling, 1 inch router bit, and a generator.

Drill the ice $\frac{3}{4}$ inch deep to lay the chips and nylon. Add warm water to fill the holes. Cold water will fog up and make the markers difficult to see. After 30 minutes, a full coat of water can be applied to the ice surface.

The nylon strapping should be used to establish three main lines: the 500m start line, 1000m finish line, and 500m/1500m/3000m/5000m finish line. All the other lines which are not in regular usage can be established using a permanent marker or chalk on race day. Add a little water, use a squeegee to smooth the surface, and the lines will remain frozen intact during the meet. They can easily be scraped off after the meet.

Track Diagrams

Speed Skating Canada provides diagrams for marking the track (mass and Olympic Style). Visit their website at <http://www.speedskating.ca/appendices> (refer to Appendix C). If you have the land space, using the 400m Mass Start Oval (183m long) is recommended because it is the easiest track to mark.

A track survey certificate is required to validate accuracy. Without a certificate, race results may not be accepted and potential provincial records will not be recognized.

Marathon events require electronic timing and a line will need to be cut into the ice (finish line) to lay the equipment.

Ice Maintenance

Ice Quality and Temperature

Unlike indoor or refrigerated facilities, it is very difficult to build and maintain consistent natural outdoor ice. Ideally, the ground should be well frozen with 1 inch packed snow (minimum) to establish a base layer. If the base is too thin, the track will quickly deteriorate during warmer periods. A solid frozen base of packed snow will allow you to build several inches of ice for a durable oval.

Build the ice surface up to 4 inches by hosing the oval. Only then will it be strong enough to support machinery. Use cold water hosing to establish the base. Use heavy duty 1 inch hoses with fireman attachment (garden hoses will not work). Hoses will freeze when the ambient temperature approaches -17°C , so keep the water running lightly when the hoses are connected and in use. Hoses should be stored inside a warm building and be drained from as much water as possible.

A truck with a cloth and water tank filled with hot water can be used for regular flooding if a Zamboni is not readily available. Be mindful of threads coming out of the cloth and do not use burlap which sticks to the ice. Skaters should not be on the ice during floods but if it cannot be avoided, it is best to drive in the same direction the skaters are moving. Allow 1 hour to resurface the entire oval. Using hot water will build harder ice than cold water.

It is not realistic to expect the ice surface will be perfectly level if built upon a field. Be mindful that water may pool under the surface during warm periods. The result is dirty ground water will erupt through the surface causing lumps that need to be leveled.

Establishing a positive and co-operative working relationship with the local ice technicians and city representatives is essential for operating an outdoor oval. Their connections, support, and knowledge is priceless. Small gifts of gratitude (such as food or warm beverages) may go a long way. Be sure to acknowledge the work done by the ice maintenance crews as it is often done in the dark, after hours, in tough conditions.

- Maintaining an ice surface 4 inches thick is ideal.
- Use an ice resurfacing machine once per week to scrape and level the ice. Apply a light coat of water.
- Sweep the ice as needed to remove debris and snow (see below). Always sweep before adding water.
- Avoid performing ice maintenance alone. Have a second person to assist with the work and provide assistance in case of injury.
- Outdoors dirt is damaging to the blade of the ice resurfacing machine (Zamboni). If working with arena staff, coordinate to have the oval scraped prior to them installing a new blade.
- Using an ice resurfacing machine on the oval is completely weather dependent. Too warm and the machine will sink in the ice. Too cold and the machine may not function and the operator is at risk of exposure.
- Have access to a truck with a snow blower/plow and a personal snow blower for snow removal after heavy precipitation.

- Clear snow 1 foot outside the track (outside the boards) and 1 foot inside the track (infield) to reduce snow blowback onto the track.
- Identify the edges of the track with flags or other markers so the track does not become lost under a heavy blanket of snow.

Holes in the ice need to be filled and sealed. A combination of slush and snow is acceptable for filling holes. Hot water should be used to seal and a hockey puck or scraper can be used to level to patch job. The repair will freeze faster than an indoor arena.

Use a sweeper with all poly bristles (no metal bristles), 32 to 36 inch diameter brush, high spin speed, and a hydraulic pivot that allows sweeping in both directions. This ensures all areas of the oval are swept evenly. Sweep towards the inner field when sweeping the inner warm-up track. Sweep towards the outside boards, changing direction of the bristles, when sweeping the outer skating lanes.

Additional Considerations for a Competition

About three weeks prior to a competition, ask the ice technician to level the ice using the ice resurfacing machine.

In the day prior to the event, the ice technician will need to spend more time working on the quality of the outer lanes (next to the boards). Typically the inner lanes accommodate more skaters during practice and, as a result, they receive more attention on a regular basis. This will cause ridges to form from the floods. The ridges need to be scraped using hand scrapers (should be available from the local arena). Once the ice is level, the ice resurfacing machine can make several passes to create optimal racing ice.

Oval usage should be closed to everyone several hours before a competition to protect the ice.

Ice Preservation

Often the public does not recognize the fragility of outdoor ice and will not respect the time it takes to produce a quality ice surface. Set up barricades around the perimeter of the oval to direct pedestrian traffic. This will minimize the damage caused by salt, sand, and other debris associated with foot traffic.

Public usage of the ice will generate the most damage – particularly by hockey players with sticks and pucks. Hockey sticks, regular footwear, and animals should not be allowed on the ice.

Consider the placement of your lighting. Flood lights should not be directly over the ice surface as they will drip and leave lumps on the ice. Ideally, sports flood lights provide the best lighting but you may be limited by what the facility can provide. The Brewer Oval in Ottawa has 13 flood lights installed by the City of Ottawa around the perimeter of the oval.

Protective Mats

Clubs should consult the protective mat recommendations put forth by Speed Skating Canada. Practice and competition mat recommendations can be found on their website at <http://www.speedskating.ca/appendices> (refer to Appendix D). Mats should be in place before the opening of the oval.

OSSA requires the Provincial Long Track Championships meet the guidelines set forth by SSC. Not finalized at time of printing.

Long track facilities may need to borrow mats from the short track facilities – especially if additional coverage is required during meets. Setting up mats during pleasant weather makes the task much easier.

Be sure to cover all surfaces within 3 meters of the external edge of the oval including lamp posts, sharp corners, tables, containers, and stairs.

Mats may develop cracks in their skin from exposure to the cold and the foam can become water logged.

Transportation of mats

Inquire amongst the members of your club to see if they have connections for a small trucking company to help out.

Ensure there are volunteers at each end to load and unload the mats.

Determine the square footage of the mats you will be transporting. This will determine the amount of floor space and the size of truck required.

Become familiar with your needs before booking the truck. You might be able to join up with other shipments and reduce expenses.

Be mindful of dirt and salt when dragging the mats. Trolleys are recommended.

Plan as far out as possible to avoid last minute charges.

Safety Considerations During Ice Maintenance

Operating and maintaining an outdoor oval presents many additional safety concerns compared to an indoor facility. Because of the size of the oval and public accessibility, it may be difficult to enforce safety measures at all times.

Below is a list of considerations and recommendations for best practices:

- Laying burlap on the walking pathways will provide traction for persons using the facility. Avoid using wood. Rubber mats are popular with skaters accessing the trailers but are not recommended for the main walkways.
- Anyone performing maintenance on the oval should make personal safety a priority. Wear grips on the bottom of your boots, wear a helmet, wear multiple layers of clothing (wool or fleece gloves underneath leather or rubber gloves protect the hands), and be vigilant about your surroundings after dark.
- If the oval is being shared with the public during speed skating practice, set up cones to separate the two groups. Inform the public to skate counterclockwise and have extra persons on site to assist with supervision.
- Establish positive working relationships with your neighbours: local councilor, schools, sports teams, nearby home owners, and law enforcement. You may need their support to maintain the facility and provide other levels of supervision.
- Build a binder of documentation specific to the needs of your oval. Include: phone numbers, emails, contracts, Emergency Action Plan, tracking sheets for oval usage, racing bulletins, and any important documents.
- Keep up-to-date equipment inventory records.
- Always have a complete First Aid kit on site.

Additional Resources

SSC Coach and Club Safety Checklists

http://www.speedskating.ca/sites/default/files/checklist_englishfinal.pdf

FPVQ Guide d'entretien de la glace lors d'une compétition

<http://www.fpvq.org/doc//Guide%20de%20glace.pdf>

Contributors

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Susan Townley, Jim Hovey, and the Ice Maintenance Team at the Brewer Oval in Ottawa, Ontario
The Ice Maintenance Team at the Olympic Oval in Calgary, Alberta
The Ice Maintenance Team in Sherbrooke, Quebec

Appendix A

ICE CONDITIONING MONITORING CHART (SEE GUIDELINES FOR USE)

Event Name: _____

Arena Name: _____

Date						
Rink						
Time						
Slab T°						
Middle of ice T°						
Brine in & out						
Ice Thickness						
Total dissolved ppm						
Flood water T°						
External T°						
External Weather						
Humidity %						
Internal T°						
# Compressors in use						
Comments						

Appendix B

Conversion Chart (courtesy of www.Asknumbers.com)

Millimetre	Inch	Millimetre	Inch	Celsius	Fahrenheit	Celsius	Fahrenheit
1	0.039370079	26	1.023622046	-14	6.8	11	51.8
2	0.078740157	27	1.062992125	-13	8.6	12	53.2
3	0.118110236	28	1.102362204	-12	10.4	13	55.4
4	0.157480315	29	1.141732282	-11	12.2	14	57.2
5	0.196850394	30	1.181102361	-10	14	15	59
6	0.236220472	31	1.22047244	-9	15.8	16	60.8
7	0.275590551	32	1.259842518	-8	17.6	17	62.6
8	0.31496063	33	1.299212597	-7	19.4	18	64.4
9	0.354330708	34	1.338582676	-6	21.2	19	66.2
10	0.393700787	35	1.377952755	-5	23	20	68
11	0.433070866	36	1.417322833	-4	24.8		
12	0.472440944	37	1.456692912	-3	26.4		
13	0.511811023	38	1.496062991	-2	28.4		
14	0.551181102	39	1.535433069	-1	30.2		
15	0.590551181	40	1.574803148	0	32		
16	0.629921259	41	1.614173227	1	33.8		
17	0.669291338	42	1.653543305	2	35.6		
18	0.708661417	43	1.692913384	3	37.4		
19	0.748031495	44	1.732283463	4	39.2		
20	0.787401574	45	1.771653542	5	41		
21	0.826771653	46	1.81102362	6	42.8		
22	0.866141731	47	1.850393699	7	44.6		
23	0.90551181	48	1.889763778	8	46.4		
24	0.944881889	49	1.929133856	9	48.2		
25	0.984251968	50	1.968503935	10	50		