Dreaming of the Ultimate Ice Rink
by Claude Sweet

Planning to build an ice rink requires some assumptions about its use. The following are my thoughts on what I would incorporate in a rink if I was designing and funding an Olympic size - 100 x 200 feet ice surface with seating, plus an 85 x 200 foot practice rink. Ice diagrams are at end of the article.

The incorporation of a second ice surface without seating should be a high priority even if the surface is not Olympic size. Seating is not necessary for the second sheet that is designed solely for training/practice sessions.

An example of multiple ice surfaces is Ice Station Valencia’s three ice surface facility in Valencia, CA. The third ice surface is a small practice rink of approximately 60 feet wide x 100 feet long. The rink also offers group classes and public recreational sessions, plus figure skating, hockey, curling and speed skating.

I would also include the following activities:

- Theater on Ice teams
- Synchronized Team Skating
- Local school skating clubs
- “Advanced Ice Skating Academy” group classes

Incorporation of Seating into Facility Planning

Practice facilities only need comfortable accommodations for parents. Sadly too many rinks are not designed to provide seating for 1,500 to 3,000 people.

Fixed folding seats

Seating adds to the profitability of sponsoring organizations that host hockey games, speed skating races, curling tournaments, ice shows, and figure skating competitions for their members.

The preferred seating of spectator events is along the 50-yard line of football fields, basketball courts, etc., with the ends being less desirable.

In stage shows or ice carnivals, the area behind the curtain’s site line are not available for sale.

The construction of an indoor arena for hockey and figure skating must consider the cost of constructing longer (wider) free spans necessary to provide maximum visibility in a cost/expense analysis based on the anticipation of filling the seats and generating sufficient revenue to break even or make a profit for the increased seating.

The same analysis must occur when considering the more expensive permanent arena seats compared to the bleacher style seating.

The construction of a multi-purpose concrete floor with embedded refrigeration pipes allows the arena to be used for other purposes while the 2nd and/or 3rd ice surface permits other skating activities to continue without interruption.

Heated Arena

Spectators appreciate having the heat from freezing the ice circulated to warm the locker/dressing rooms, restrooms, lobby, and the seating areas, plus provide hot water throughout the building.

The specifications must properly size the refrigeration equipment to have enough capacity to dehumidify the air in the rink and surrounding rooms.
Locker and Dressing Rooms

One method of reducing the per square foot construction cost is to construct the seating above the public restrooms, lockers and dressing rooms. It is possible to design the seating so it starts at the ice level (arena style) and situating private and public areas under the seating (below the level of the ice surface).

A locker room is used to change clothes which and has full rest room facilities including showers. There may also be an adjacent equipment storage room that provides permanent storage for a fee. If towels are provided, a laundry service fee is usually charged. An extra fee would be required to launder the hockey uniforms after games and practices.

A dressing room is used just to change clothes and secure valuables while the athlete is skating. The rest-room facilities do not include showers. An equipment storage room with permanent lockers may be provided for an extra annual fee.

Lockers in the equipment room would be available for an annual fee to store skates and other equipment by being secured with a personal lock.

Access to the rink surface from the locker and dressing rooms would be provided via ramps. Stairs should be off limits to skaters to prevent accidents.

Many rinks construct the locker rooms at the ice level and seating is placed on top of the rooms. This substantially reduces the amount of seating because of the six+ feet of space between the rink barrier and the walls of the locker rooms.

Spotlights

Permanent platforms for spotlights with dedicated electrical service should be included around the perimeter of the rink at a level above the seating so there is no interference with spectators sitting below the spotlights.

Video Stations

Platforms for video cameras would be provided at rink level and from elevated locations throughout the rink. All locations would have electrical connections.

Video cable would be installed from camera locations to provide video capture for the panel of Technical Specialists used in IJS figure skating events and to a central video control center used by a private company providing professional quality DVDs of the skater’s performances. A connection to a video sales area would be part of the planned music and video design.

The above video and audio equipment is a separate system from the video surveillance/security equipment that is common in public, private, and government buildings.

Building Accessibility

The seating should be design for access from the top (back) of the stands. It is important to provide areas for wheelchair access to view the public and practice sessions, shows, races, tournaments, and competitions.

To prevent accidents and eliminate damage to skate rentals, floors, and seating, access to ALL stairs would be prohibited.

This means ramps would be used throughout the building and a minimum of one elevator for areas accessible only by stairs – this includes private areas used by employees even if not required by building codes.

The rink needs to have a skate equipment and apparel shop, skate rental counter, repair facility, skate changing area, rental lockers, and food service court on the ground level as customers enter the rink.

Location of Locker Rooms

Ideally, the locker rooms for the hockey and speed skaters, plus a separate locker room for officials, would be located on the side where the home and visiting teams hockey player boxes are located.

On the opposite side of the rink is where the hockey penalty boxes and controls for the hockey
scoreboard would be located. Additional locker rooms would be provided on this side for the dual use of hockey, speed, and figure skating announcers, sound/music engineers, USFS judges and officials. These locker rooms would also be used by the figure skating judges for test sessions.

Dressing rooms for figure skaters and curlers, plus a hospitality room for figure skating officials would be located under the seating of the rink on the opposite side of the hockey player benches.

A separate locker room used by rink coaches would have a restroom and an adjacent room to serve as a hospitality room for coaches during competitions.

Public lockers with a coin operated key lock should be available so skaters on a public session or group class can store their shoes and articles of value while they are skating.

**Figure Skating Accommodations**

Special attention should be made to provide dedicated electrical and Internet service to the hospitality rooms and at rink side. Care should be taken to avoid overloading electrical circuits. All circuits that will run computers should have power source modulated to prevent surges.

The seating design should consider the needs for panels of judges, technical panel, music, announcer, and accountants who will be rink side at higher events at qualifying competitions.

Judging panels for Synchronized Team Skating, Showcase, and Theater on Ice competitions need to be elevated so the seating at the top of the stands should be removable of temporary risers installed for these special events.

Access to the ice surface can be provided at the ends of the rink for public skating and curling. The locker rooms can incorporate direct access to the ice surface and the home and visitor hockey boxes.

Dressing rooms for figure and speed skating would have easy access gates to the ice at the corners of the rink surface via a hallway under the seating or by a sloping hallway to the midline on the side of the ice.

**Rink Equipment**

Location of the resurfacing equipment should be at one corner of the building that does not require people or skaters to cross the area used by the Zamboni.

Please note that the hockey nets need to be stored close to the Zamboni access gate to the ice. Curling stones (rocks) need to be stored in a special area on the ice.

The Zamboni should be run by natural gas or preferably electric power to provide the most healthful indoor air conditions for athletes and spectators.

Several Zamboni resurfacers are necessary to operate a facility with multi ice surfaces. This type of equipment needs regular maintenance and a backup machine must be maintained and be ready for use in case of a breakdown.

The refrigeration equipment should allow separate ice temperatures to be maintained on each surface that is ideal for speed, hockey, curling, and figure skating. This may require installing several compressors to match the cooling needs with the demands for lower power consumption.

Remember that the equipment needs to be maintained while holding the ice under extreme outside temperature and humidity conditions. Running at full capacity for weeks at end invites an equipment failure.

The internal humidity must be a priority and justifies the additional refrigeration capacity to operate it. The saving in reduced building maintenance plus there is a superior enjoyment level for spectators.

The refrigeration equipment can be located below the level of the ice surface and in a separate building.
The heat from the compressors can be used to melt the shaved ice the Zamboni dumps in the snow pit. The compressor heated water can also be circulated throughout the facility, plus heating to the non skating areas such as sitting, food court, locker rooms, skate counter, etc.

An indoor swimming pool can be an excellent way to dissipate and utilize the heat created by the refrigeration compressors. The dimensions of the pool should meet the official standards to hold meets.

Water from the snow pit can be cooled and collected recycled to irrigate the outside landscape.

**Full Service Training Facility**

An ice rink must offer more than just the ice surface and a staff of coaches. To be economically successful, new rinks are offering a full line of training services.

A facility that is a fully equipped to offer weight training, ballet, gymnastics, ballroom/hiphop dance, swimming, and racket ball facilities would be staffed with qualified, certified individuals offering group and private instruction. This broadens the appeal to other members of a family who do not ice skate or play on a curling team.

Such on site facilities also are convenient and very useful for the athletes to warm-up, improve their strength, conditioning, flexibility and choreography for figure skaters.

**Wire the Building for Wide Band Technology**

Video and Internet wiring should be preinstalled as part of the rink sound system. This facilitates contracting with a company to video figure skating competitions, shows curling tournaments, speed races, and hockey games. A properly pre-wired building would make it much simpler to arrange to broadcast skating events on a local public television or cable channel.

Install rink side portable stop motion video equipment for training skaters in multi-revolution jumps provides the ultimate in training of figure skaters. It also can be used in hockey and speed skating programs.

The installation of flat screen TV monitors throughout the facility, especially in the food court and the parent spectator lounge, helps parents observe their child while performing a variety of activities like sewing costumes, knitting, or performing job related activities on their laptops.

**Internet Access**

Provide parents and skaters with a comfortable work/study area with Internet access. Parents really appreciate having the opportunity to catch up on their work while waiting for their son or daughter.

Increasingly skaters are opting for home schooling or being able to arrange special scheduling with the local school district so they can skate at off peak daytime hours.

These kids frequently may need to do some of their homework, connect to the Internet or participate in distance learning classes during breaks between training activities at the rink.

**Hospitality and Food Court**

Many new rinks offer adult beverages and a fast food service for parents and general public who have a view of the ice surfaces while dining.

The [Ice Den in Scottsdale, AZ](#) is an excellent example of a modern new ice rink with a dual surface and both types of food service.

On site food preparation requires a license and passing regular cleanliness inspections. Serving wine and beer requires a liquor license. Generally, the effort to obtain a liquor license needs a fairly large volume of adults who are purchasing full meals at a sit down service to justify the expense of a bar and bartender(s).

Such an eating establishment generally should be primarily accessed from an outside entrance in addition from inside the ice rink.

The food court concept embraces more of a fast food menu that is quick to prepare and the customers order at a counter and have a pickup number that is called when their order is prepared.

Depending on the geographic market area/location of the rink, it may be possible to actually have
one or more retail food businesses serving both the general public and rink patrons.

Most rinks typically offer birthday skating party packages. A large room is generally reserved for this type activity and may be divided into smaller sections to allow multiple celebrations to be booked during the same time period coinciding with public skating sessions.

Ice Surface

The curve of the corners of an ice surface is a 20 foot radius for either an 85 foot or 100 foot wide ice surface.

Racquetball – Handball Specifications
Racquetball, Handball, and Squash Courts Glass Viewing

Dimensions for Class B and C Swimming and Racing Pools

Number of Lanes
All championship swimming competitions shall be conducted in racing courses having a minimum of eight 7-foot (2.13m) lanes.

Standard Length
All championship swimming competitions shall be conducted in racing courses of standard length (75 feet, 1 inch; 25 meters, 2.54 centimeters; or 50 meters, 2.54 centimeters).

**Plummet Depth**

For all championship and nonchampionship springboard and platform diving competitions, the water depths at the plummet may be no less than the minimum standards as specified:

- **Preferred**—The racing course should be 164'13⁄16" (50m, 2.19cm) in length by 75'13⁄16" (22.26m) in width, providing for eight 9' (2.74m) lanes with additional width outside lanes 1 and 8.

  A minimum water depth of 7' (2.13m) is desirable for competition. Optional markings: nine 8’ (2.44m) lanes or ten 7’ (2.13m) lanes.

- **Acceptable**—The racing course may be 164'13⁄16" (50m, 2.19cm) in length by 60’ (18.29m) in width, providing for eight 7’ (2.13m) lanes with additional width outside lanes 1 and 8.

  The water depth may be no less than 4’ (1.22m) at the starting end of the racing course and no less than 3’6” (1.07m) at the opposite end. A water depth of no less than 4’ (1.22m) is recommended throughout the entire length of the racing course.

**Short-Course Swimming**

- **Preferred yards**—The racing course should be 75'13⁄16" (22.26m) in length by at least 60’ (18.29m) in width, providing for not less than eight 7’ (2.13m) lanes with additional width outside lanes 1 and 8.

  A minimum water depth of 7’ (2.13m) is desirable for competition.

- **Preferred meters**—The racing course should be 25.03 m, (82'11") in length by at least 60’ (18.29m) in width, providing for eight 7’ (2.13m) lanes with additional width outside lanes 1 and 8. A minimum water depth of 7’ (2.13m) is desirable for competition.

- **Acceptable yards**—The racing course may be 75'13⁄16" (22.26m) in length by 30’ (9.15m) in width, providing for at least five 6’ (1.83m) lanes. The water depth may be no less than 4’ (1.22m) at the starting end of the racing course and no less than 3’6” (1.07m) at the opposite end.

  A water depth of no less than 4’ (1.22m) is recommended throughout the entire length of the racing course.

**Curling Sheet**

- **Pebbling**—The ice can be pebbled as it would be in any curling facility. Fill your tank with hot Zamboni water (the hotter the better). Use a standard curling pebbling sprinkler head available in catalogs to ensure that you get the correct pebble size.

  The back-pack style are easier to hold, but are more expensive. It is helpful to pebble a large area of ice behind the hacks so that new curlers get used to sliding on that surface before they step onto the sheet.

  If you are installing practice-hacks in the arena away from the actual curling sheets, pebble those areas also.

**Water Treatment Systems for Ice Making**

A ph level below 7.0 is strongly recommended for a quality ice surface. Water treatment methods are well standardized and each has its own advantages if it is properly used for the intended application in question.

It is highly recommended that competent experienced suppliers be sought prior to any purchases being made. Decisions of purchase should be based on proven industry
related testimonials with consideration to chemical costs, annual maintenance fees

Layout of a curling Sheet

![Diagram of a curling sheet layout]

A short speed skating track can be skated on a 85 x 185 foot ice surface.

**Exhibit B**

**111.12 Meter Short Track Speed Skating Oval**

![Diagram of a speed skating oval]

Moveable markers of rubber or other suitable material shall be used to mark the track. The number of markers should be sufficient to define the track clearly.

Seven (7) markers shall be used to define each curve (turn) with the distance between every other marker being the radius of the curve. See Exhibit A.

No track markers shall be of such size and width, or be fixed to the ice, so that they will not move freely if they are struck by a skater.

The height of the markers should not be over 5.08 cm in height as to be struck by a skater. Cones are too tall and are not acceptable for marking the track.
Safety mats must be present during all training sessions and competition races. Rink barriers shall be covered by mats from the curve apex block to the center line of the rink.

The mats shall be of double thickness along the rink barrier on the far side of the curve (see Exhibit B).

Mats shall be attached to the rink barrier with their weight on the ice. Mats should be made in such a manner and of such materials that they will minimize debris which might accumulate on the ice as a result of use of the mats.

Mat height must be adequate to cover the height of the wall (barrier) surrounding the ice rink.

Exhibit B
Mat Placement

![Mat Placement Diagram]

Two full size skating rinks can fit inside the Olympic Long Track Speed Skating Oval. See diagram.