

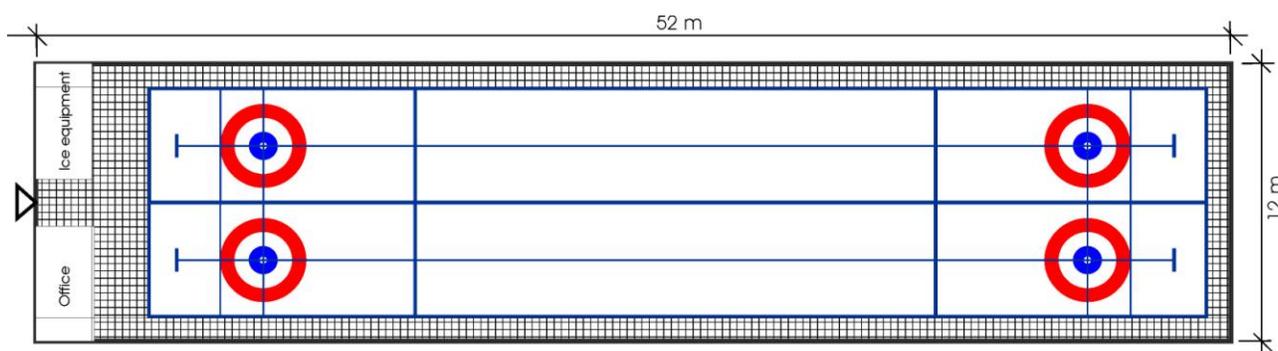
Portable Curling Rink - two sheets (PCR2)

A portable curling rink could be the best solution to start curling in new areas. When the curling has become established and many people play, there is a better chance of being able to build a permanent curling rink and the portable rink could then be moved to another location.

In this document, the World Curling Federation presents what a portable curling rink could look like and also determines the preliminary costs involved in establishing a two-sheet portable rink.

Plan

The building would be designed so that there would only be curling going on inside. The changing rooms, club rooms and toilet facilities would be located in another building which would need to be nearby. For example, a barrack tent could be used. See below a plan of the curling area inside the tent with walkways, an ice equipment room and an office.



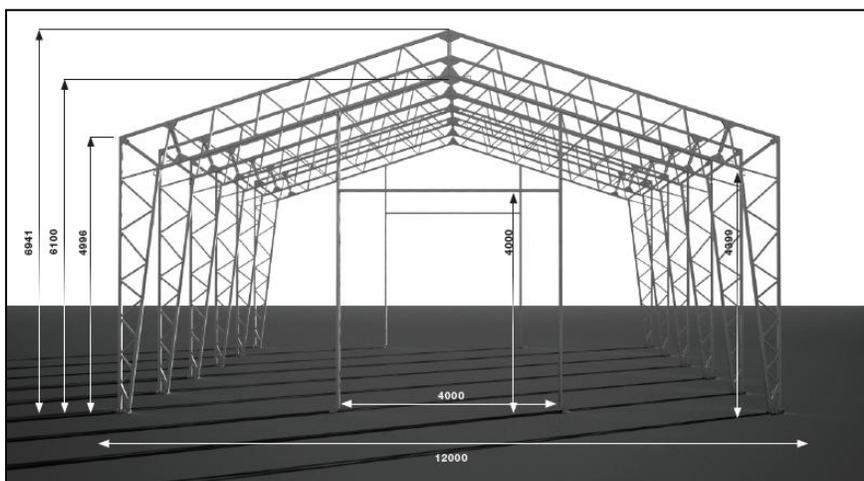
A: Plan for two-sheet portable curling rink

The building

A tent is the most portable building solution to use. Today it is possible to produce tents that are built with PVC, are well insulated, are air/humidity tight and can bear heavy loads (e.g. snow) on the roof. The tent in the picture below comes from O. B. Wiik in Sweden. It has a double PVC covering with Styrofoam insulation in-between. The load-bearing structure is made with galvanized steel.



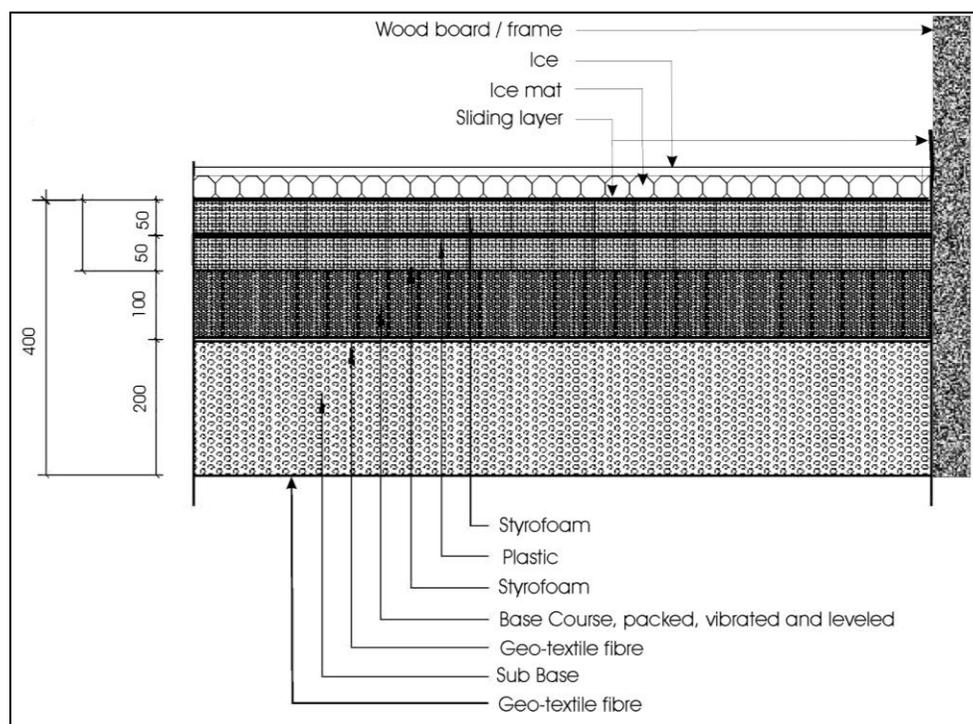
B: Type of insulated PVC tent which could be used for two-sheet portable curling rink



C: Steel construction can bear snow load of up to 350kg/m²

The floor

As this is a portable rink, an ice mat is the best way to produce ice as the mat is removable. The base for the ice mat must be stable and must not move. It can be constructed in different ways depending on the condition of the ground underneath. If the ground is 'normal' but not stable, it will need to be dug out to 30 cm deep and filled with a sub-base and base course, hard packed and levelled. If the floor is to be located on asphalt, normally the sub-base and base courses are already there and the insulation can be put down directly onto a levelled sand surface. See diagram below showing a section of a 'normal' base.



D: Floor section for installing an ice mat

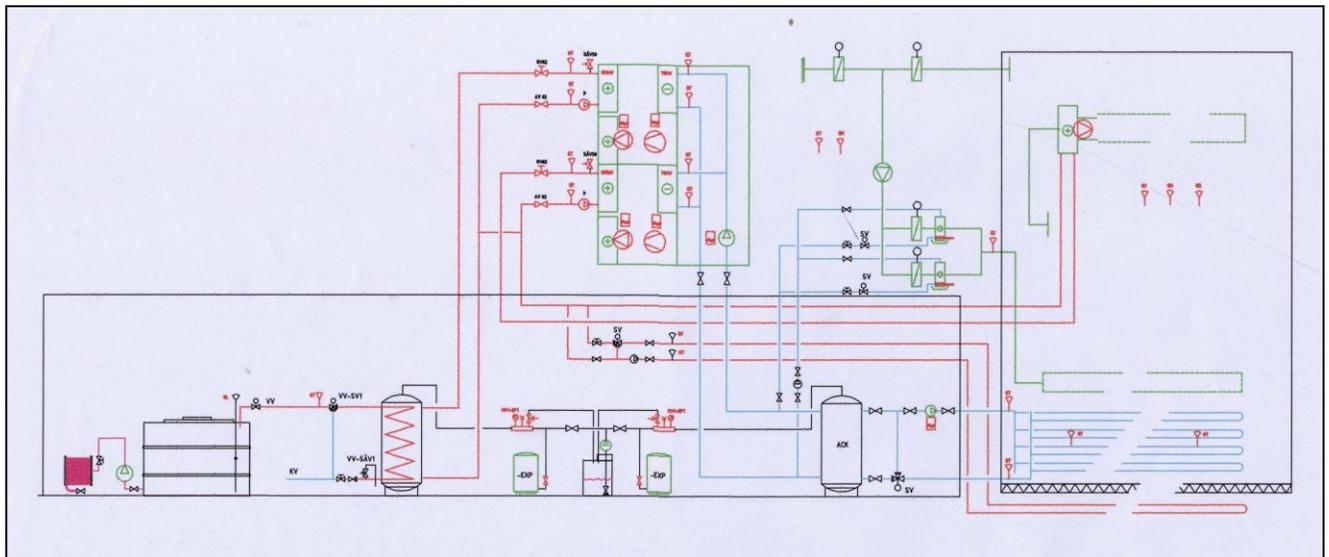
Cooling plants

A portable solution for housing the cooling plants with a heat recovery system is to mount everything inside a container:



E: Cooling plans inside a container with condenser fans on top

The cooling capacity for a two-sheet portable curling rink with an ice mat is about 70kW with two or more compressors. One system is required to connect all the plant as you can see in the diagram below.



F: Process chart for cooling, heating and dehumidification (Ola Lundborg ÅF)

Lighting and heating fans

Three rows of fluorescent strip lighting can be mounted in the roof of the tent. The heating of the structure and the location of the fans must be investigated carefully to find the lowest possible energy consumption system.

G: example of simple fluorescent strip lighting for a curling rink.



Investment costs

The figures below are based on an estimated cost level in Sweden. No tender has been made which means that these costs could be lower, particularly in countries with a lower cost of living. The choice of materials and plants are of high quality to help ensure good curling ice.

Planning and project leadership	€ 10 000
Excavation	€ 1 000
Insulated and portable PVC tent (high quality)	€ 65 000
Foundation and insulation for ice mat	€ 22 000
Ice mat (AST)	€ 37 000
Air heating fans - Dehumidification	€ 15 000
Lighting, 3 rows/fluorescent	€ 6 500
Electricity, water, drainage	€ 5 000
Remaining (walkways and similar)	€ 5 000
Municipal expenses/fees	€ 5 000
Cooling plants (Scroll) with heat recovery	€ 75 000
Freight	€ 4 000
Unforeseen expenses	€ 10 000
Total	€ 250 500
Technical room and office within the structure	€ 5 000

Location close to a hockey rink means that cooling plants would not be required, instead a 'three-way shunt' could be used. A heating system would also be required. Using cooling plants from a nearby hockey rink can save some money.

Running costs, energy

The energy cost for running a curling rink will vary from area to area. It also depends on the quality of the floor and the building. The table below estimates the energy costs for a two-sheet portable curling rink as shown in this document. If the structure is located in a humid area then dehumidification could be costly with traditional dehumidifiers, but there are also solutions to take care of some of the humidity in a more cost-efficient way.

Item	KWh per day	Comments
Maintaining the ice	400	Depends on weather conditions in the area
Lighting	40	
Heating (100% heat recovery)	0	
Dehumidification	0 to 300	Depends on how humid the area is
Electricity common	10	
TOTAL:	450 to 750	Per day

If you have any further questions please forward these to the World Curling Federation Secretariat at: info@worldcurling.org

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World Curling Federation

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