

The issue of perma- frost build-up is covered in depth in the ORFA Ice Making and Painting Technologies (IMPT) course materials. The following should provide some insight on the subject.

- Ice will naturally build under the pad in the same manner as above the pad by freezing the moisture that occurs naturally in the soil. How much is built will be controlled by the amount and quality of insulation and vapour barrier placed at the time of construction. These will only slow the perma-frost ice creation – it will not stop it.
- The next barrier is the warming system which can be recirculated secondary refrigeration that is slightly warmer than the brine being used to remove heat from the ice sheet, or electrical warming wires or at times, warm air pushed through piping buried in the soil beneath the pad.
- The best practices for systems without a warming option is that the ice needs to be out 1 month for every 2 months there is ice – this allows the ground beneath the pad to thaw. Variables include types of soils and water content below the building that are naturally in place.
- If the soil is not allowed to properly thaw, what happens, as an example, is 6 inches of perma-frost is developed. Ice in for 8 months out for 4 with the secondary pump left to run for a portion of the ice out period as well as opening the doors to increase the ambient air temperature should thaw the 6-inches of perma-frost. However, if not performed what will happen is that only 4 of the 6 inches thaws leaving 2 inches in the ground. Once again, 6 inches is created but is added to the 2 inches left behind creating 8 inches. This continues to compound over time and the perma frost reaches solid ground below the pad and it pushed up. I was in Cambridge a few years back and they were down over 7ft digging out the perma-frost. There was another north of North Bay and in the Listowel area not long ago. As Rob shared, jump onto the ORFA Discussion Board and ask the question at <https://www.orfa.com/forum-refrigeration-and-ice> and ask the members for their input.
- Ask your refrigeration contractor for an opinion and also ask them for examples of rinks they have had to fix – it is more common than most realize. I have heard of members who have paid for thermal imaging to determine perma-frost build-up or who have had core samples drilled just outside the pad to see if there is an issue. Ask your refrigeration contractor about this option also.

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