



March 9, 2024

Mitch Kellen  
Grand Rapids Hockey Association

Dear Mitch,

**Rink-Tec International, Inc.** is exclusively in the business of designing and installing industrial ice rink refrigeration systems and accessories. We offer complete design services for refrigeration; sub-floor heating systems and waste heat reclaim systems. The following is a description of the major products Rink-Tec International can offer you:

#### **84' X 192' CONCRETE RINK FLOOR SYSTEM**

**Mains** - The refrigeration mains between the outdoor chiller and the refrigerated floor are 8" SDR 11 fusion pipe with 2.5" thick pipe insulation and jacket. Once the mains are tested, they will be backfilled.

**Sub-Floor Heating System** - The sub-floor heating system will be constructed of 1" O.D. high density polyethylene tubing placed on 18" centers throughout the rink floor. The manifold system will be constructed of 3" SDR 11 fusion pipe and fittings. The polyethylene tubing is connected to the manifold with 1" SDR 11 fusion fittings. The mains will be stubbed up in the mechanical space for future connection.

**Fine Grading** - This section consists of placing 6" of the granular material on top of the subfloor heating system and leveling that fill to plus or minus 1/4" throughout the rink area.

**Rink Floor Insulation** - This section consists of furnishing and installing two layers of 2" thick 25 psi extruded insulation on top of the fine grade, including cutting and fitting the insulation to conform to the profiles of the rink and the header trench.

**Vapor Barrier** - This section consists of furnishing and installing a 6 mil. Vapor barrier on top of the rink floor insulation including overlap of vapor barrier material.

**Reinforcing Steel** - This section consists of furnishing and installing 22,500 lbs. of #4, grade 60 reinforcing steel on top of the reinforcing steel supports. The steel is installed on 14" centers the 84' direction of the rink floor and 12" centers the 192' direction of the rink floor.

**Rink Floor System** - Our refrigerated floor manifolds are constructed of 8" SDR 11 fusion pipe. They will be in a header trench at center of your ice-skating surface. The rink

floor tubing is 1" SDR 11 pipe placed on 3½" centers. The return bends are 180° fusion fittings connected to the rink floor tubing at each end of the rink. Our tubing spacers are constructed of 3/16" wire with a 3" wide foot plated for stability. They are placed in 2' centers throughout the rink floor and double as reinforcing steel supports.

**Mesh** - This section consists of furnishing and installing a 6" x 6" 10-gauge wire mesh on top of the rink floor tubing.

**Rink Floor Concrete** - This section includes providing a complete design mix, concrete testing, furnishing, and placing the concrete, proper finishing, and visqueen cure of the concrete. The concrete will be placed with a concrete pump. The concrete design will include a water reducing agent, air entrainment, and super plasticizer for the placement.

**Dasher Inserts** – Rink-Tec will furnish the necessary dasher-board inserts so the boards can be installed on the refrigerated slab versus the perimeter.

**Expansion Joint** - This section consists of all the materials that make up the expansion joint which separates the refrigerated ice rink concrete from the outer perimeter concrete.

**Chiller System** – Rink-Tec will provide a used 170-ton air cooled refrigeration system complete with pumps and connection piping.

It will provide 170 tons with a design flow rate of 900 GPM. The unit comes charged with R134A. A complete charge of inhibited ethylene glycol with deionized water will be provided.

All connection piping will be Schedule 40 Steel pipe and fittings for the glycol piping and will include all necessary pipe hangers and necessary supports. All new glycol piping will be insulated with Styro insulation, complete with vapor barrier and sheet metal cover.

The **price** for all materials listed above for a complete concrete floor installation and outdoor refrigeration system is **\$1,138,935.00**. This quotation includes all necessary labor, freight, and crane work.

### **Deductive Options -**

If GRYHA supplies 1850 pieces of 20' #4 grade 60 rebar, deduct \$12,000.00.

If GRYHA supplies 26 rolls of 6x6x10,10 wire mesh, deduct \$3952.00.

If GRYHA supplies 1200 sheets of 2"x 4'x 8' 25psi extruded insulation, deduct \$38,000.00.

If GRYHA supplies 800 tons of granular sand, deduct \$12,000.00.

If GRYHA supplies 260 yards of ready mix per mix design, deduct \$37,000.00.  
If GRYHA supplies an electrician to hook up electrical connection to the used chiller and pumps from the disconnect, deduct \$18,000.00.

Volunteer Labor – Rink Tec will use approximately 600 hours of volunteer labor at a \$45.00 per hour labor credit. Rink-Tec will supply a sign in sheet on the jobsite. Each volunteer will sign in before they start work and sign out once they leave. The hours will be tabulated, and a credit given for every hour that is supplied by a volunteer.

To delete the subfloor heating system under the new rink slab, deduct \$15,000.00.

To delete the cast in place dasher anchors and install the boards on the perimeter, deduct \$4,000.00.

For a used YVAA0273 chiller system that will supply 138 tons of cooling capacity, deduct an additional \$42,000.00. This chiller uses R134A and will only require a 600 Amp 480 Volt disconnect. This chiller is approximately 3 years old and comes with a full two-year warranty.

Rink-Tec will provide a complete set of stamped engineered construction drawings by a licensed State of Minnesota Mechanical Engineer. The floor system will carry our standard five-year warranty. The chiller quoted originally will carry a one-year warranty.

**Other Items** - Other items necessary for a complete installation which are not included are:

- Dasherboards removed prior to rink construction.
- Necessary Site Work to clear the rink area to -14 from finished floor elevation.
- 800 Amp / 480 Volt Electrical service and disconnect withing 10' of refrigeration system pad.
- Concrete Pad for the outdoor refrigeration system as well as screening.
- Any required permits.

I hope this information will be helpful to you. If you need any further information, please contact us.

Yours truly,

*Kyle Gillespie*

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Rink-Tec International, Inc