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An American National Standard

Standard Guide for Ice Hockey Playing Facilities¹

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INTRODUCTION

Since its inception, the game of ice hockey has evolved as a result of a convergence of ideas from Canada, the United States, and Europe. As a result of differing influences, there are a wide variety of playing facilities currently in use, accompanied by wide disparities in margins of safety provided to players and game officials.

The purpose of this guide is to reach a common understanding by providing a guide for the design and construction of the playing facility. Attention is called to the dimensions of the ice surface. The majority of facilities in Europe comply with those of the International Olympic Committee, 200 ft (60 m) in length and 100 ft (30 m) in width, while in North America, the majority of facilities are 200 ft (60 m) in length and 85 ft (26 m) in width.

In the interest of future standardization, it is recommended that ice surface dimensions of all new facilities are those found in this guide.

It is recognized that ice hockey playing facilities also are used for figure skating, speed skating, pleasure skating, and for the sports of broomball, curling, sledge hockey, and ringette. Organizers of these sports may adopt the present standard as written or modify the guide in accordance with their special interests.

1. Scope

1.1 The intent of this guide is to provide consistent safety considerations in the design and construction of new ice hockey rinks in order to reduce potential safety hazards. It is intended to standardize game conditions and establish guidelines that will provide a level of conformity for the purpose of competition and reduce potential hazards to players and game officials.

1.2 This guide should be taken into consideration by architects, designers, engineers, construction companies, construction contractors, and appropriate inspectors who may be involved in the design and construction of new ice hockey rinks. This guide applies to the development of new arenas and to existing facilities that will be renovated.

2. Referenced Documents

2.1 ASTM Standards:

A 53 Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless²

A 60 Specification for Chromium-Vanadium Steel Bars for Springs³

A 185 Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement⁴

C 150 Specification for Portland Cement⁵

C 260 Specification for Air-Entraining Admixtures for Concrete⁶

C 494 Specification for Chemical Admixtures for Concrete⁶

² Annual Book of ASTM Standards, Vol 01.01.

³ Discontinued; 1965—Replaced by Specification A 689. See 1964 Annual Book of ASTM Standards, Part 3.

⁴ Annual Book of ASTM Standards, Vol 01.04.

⁵ Annual Book of ASTM Standards, Vol 04.01.

⁶ Annual Book of ASTM Standards, Vol 04.02.

¹ This guide is under the jurisdiction of ASTM Committee F08 on Sports Equipment and Facilities and is the direct responsibility of Subcommittee F08.66 on Ice Rink Facilities.

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C 578 Specification for Rigid, Cellular Polystyrene Thermal Insulation⁷

D 412 Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers—Tension⁸

D 1056 Specification for Flexible Cellular Materials—Sponge or Expanded Rubber⁹

D 1667 Specification for Flexible Cellular Materials—Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam)⁹

F 355 Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials¹⁰

2.2 Other Standards:

MIL-STD-810C¹¹

MVSS 302

DIN 18 036 Hallen für den Eissport¹²

ANSI Z97.1 Specification for Glass¹²

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *board cap or railing, n*—a wood, plastic, or plastic-coated wood material 3 in. (7.62 cm) $\pm$ 1 in. (2.54 cm) in width, attached at right angles to the top of the boards.

3.1.2 *dasher boards, n*—a wall of wood or plastic-coated wood, fiber glass, or other high-impact material that encloses and is part of the playing surface. Also called *the boards*.

3.1.3 *enclosure, n*—that part of the playing facility that surrounds the perimeter of the ice surface and consists of a lower section (the kick-plate) that contacts the surface of the ice, the boards, and a vertical extension above the boards (the glass). Together, these three elements are meant to confine the area of play.

3.1.4 *game lines, n*—colored lines drawn below the ice surface that divide the playing surface into various areas as described in the rules of play.

3.1.4.1 *blue line, n*—a blue line, 1 ft (30.5 cm) in width, drawn parallel to and 60 ft (18.3 m) from the goal line and extending up to the top of the boards.

3.1.4.2 *center circle, n*—a blue circle, 2 in. (5.1 cm) in width, 30 ft (9.1 m) in diameter, whose center point is the midpoint of the center line.

3.1.4.3 *center face-off spot, n*—a circular blue spot, 1 ft (30.5 cm) in diameter, whose center point is the midpoint of the center line circle.

3.1.4.4 *center line, n*—a red line, 1 ft (30.5 cm) in width, that divides the ice surface into two halves, drawn at right angles to the long axis of the playing surface and extending up to the top of the boards.

3.1.4.5 *face-off circle, n*—a red line, 2 in. (5.1 cm) in width, 30 ft (9.1 m) in diameter, forming a circle, whose center point is 22 ft (6.7 m) from the midpoint and 20 ft (6.1 m) away from the goal line.

3.1.4.6 *face-off spot, n*—a circular red spot, 2 ft (61 cm) in diameter, whose center point is the same as the face-off circle. Within each face-off spot, draw two parallel lines 4 in. from the top and bottom of the spot. The remainder shall be painted white. All lines (center, blue, goal, goal crease, face-off circles, and spots) shall be applied below the ice surface except for placement on the boards.

3.1.4.7 *goal crease line, n*—a red line, 2 in. (5.1 cm) in width, 6-ft (1.83-m) radius, forming a semicircle with the open end facing the nearest end of the rink and whose center point is the midpoint of the goal line. This area, excluding the red lines, should be painted a light blue color.

3.1.4.8 *goal line, n*—a red line, 2 in. (5.1 cm) in width, drawn parallel to the center line.

3.1.5 Goal and Goal Net:

3.1.5.1 *goal, n*—two rigid hollow tubular metal posts 2 in. (5.1 cm) in diameter attached to the surface of the ice on the goal line, rising vertically 4 ft (1.3 m) and set 6 ft (1.83 m) apart measured from the inside of the posts.

3.1.5.2 *crossbar, n*—the goal posts are connected at the top by a straight crossbar of similar material and dimensions as the posts, and at the bottom by a curved metal bar 1.25 in. (30 mm) in diameter, which contacts the ice and extends toward the end boards a distance of 42 in. (1.05 m) at its deepest point. At the top there is a curved metal of similar size, parallel to the ice surface and extending toward the end boards a distance of 20 in. (50 cm) at its deepest point. The curved bars are connected at their centers by a straight, round bar 0.75 in. (18.3 mm) in diameter.

3.1.5.3 *goal net, n*—a net of appropriate mesh and cord size to resist the penetration of a high velocity puck shot, connected to the posts and the crossbar. It should be loosely draped over and attached to the metal framework of the goal extending behind the goal line. There shall be attached to each goal frame a net made of white nylon cord which shall be draped in such manner as to prevent the puck from coming to rest on the outside of it. The net shall be made of three-ply twisted twine (0.130-in. diameter) or equivalent braided twine of multifilament white nylon with an appropriate tensile strength of 700 lb. The size of the mesh shall be 2½ in. (inside measurement) from each knot to each diagonal knot when fully stretched. Knotting shall be made as to ensure no sliding of the twine. The net shall be laced to the frame with medium white nylon cord no smaller in size than No. 21.

3.1.5.4 A skirt of heavy white nylon fabric or heavyweight white canvas shall be laced around the base plate of the goal frame in such a way to protect the net from being cut or broken. This skirt shall not project more than 1 in. (2.54 cm) above the base plate. At the base of the frame and extending up the center support post, 2 to 3 in. canvas covered padding should be secured on the inside of the goal to prevent the puck from rebounding out of the goal off the frame. The entire goal frame should be secured in place using hard rubber pegs which are inserted into the ice and which the two hollow metal posts of the goal will fit over.

3.1.6 *ice hockey playing facility, n*—a playing surface consisting of a horizontal ice surface surrounded by a vertical enclosure used for the sport of ice hockey.

⁷ Annual Book of ASTM Standards, Vol 04.06.

⁸ Annual Book of ASTM Standards, Vol 09.01.

⁹ Annual Book of ASTM Standards, Vol 08.01.

¹⁰ Annual Book of ASTM Standards, Vol 15.07.

¹¹ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

¹² Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

along the perimeter of the ice rink, known as the edge, is flush (to the kick-plate) and without any gaps. Design installation of any type of ventilation or heat source so that it does not directly affect the surface of the ice.

3.1.7 *kick-plate, n*—that portion of the boards that contacts the ice surface, made of a high-impact material and also part of the playing surface.

3.1.8 *spectator shielding, n*—a transparent, shatter-resistant glass, plastic, or similar material that is also part of the playing surface and extends above the boards.

4. Structures and Environment

4.1 *Surface Configuration*—Design the rink as described in Fig. 1. Ensure that the sides of the rink are straight and the corners rounded to a 28-ft (8.1-m) radius. The player's boxes may be adjacent to each other on the side of the playing facility opposite the penalty boxes and scorekeeper's area or on opposite (sides) from each other (see Fig. 1).

4.2 *Dimensions*—The playing surface shall be 200 ft (60 m) in length and 100 ft (30 m) in width (olympic size), and shall have a minimum of 20-ft clearance above the ice surface. It is acceptable to build the playing surface to be 200 ft in length and 85 ft in width (NHL) or 185 ft in length and 85 ft in width. All three dimensions assume plus or minus standard construction practices.

4.3 *Dasher Panels*—Dasher panels should be prefabricated in demountable sections. The design of all panels, whether

straight section, curved section, or section in which a gate is located, shall be fundamentally similar. Each section should have a frame made from either steel, wood, or aluminum which extends the full height of the dasher panel. This frame shall allow for fastening of the polyethylene or wood facing at each end. This will ensure flush mating of the acing at the dasher panel joints.

4.3.1 *Caprail*—A polyethylene or wood caprail shall be through-bolted to the top horizontal framing member. The ice side of the caprail shall have a smooth and rounded edge flush with the dasher facing. Color of the caprail can vary according to the owner's needs.

4.3.2 *Supports and Anchoring*—Vertical candilever support posts shall be placed at sections or in joints and through-bolted to the end plates of each panel. The dasher panels shall be anchored to the concrete floor using anchors and bolts. The dasher anchors shall be an internally threaded flush type that will hold the dasher straight and erect. Anchors shall be installed at the time of dasher installation. The minimum distance between the dasher board and any permanent structure shall be 3-in. (7.62-cm) minimum with any support or backing.

4.3.3 *Standard Sizes*—Standard size of straight dasher panels shall be 96 in. (2.44 m) long, 40 in. (101.6 cm) × 48 in. (1 m) high, and 3.5 in. (8.89 cm) to 6 in. (15.24 cm) wide. Standard size of curve dasher panels shall be 95 in. (2.41 m) long.

4.4 Gates:

4.4.1 *Access Gates*—If required, access gates for public skating and other large entry use shall be built into standard 8-ft (2.4-m) sections and can vary from 3 to 5 ft in width. Gate latches shall be a single latch or can be similar to that used on the equipment gates. Gates on the radius shall have two latching points of contact.

4.4.2 *Players' Gates*—Players' gates shall be built into standard 8-ft (2.4-m) sections and shall be 30 in. (76.2 cm) wide, swinging either left or right and swinging away from the ice and to the end of the bench. The gate latch shall be a single latch type.

4.4.3 *Equipment Gates*—Equipment gates shall be double-leaf gates with a 10-ft (3.05-m) opening. Gate latches shall be of sliding bar latch type using 2-in. (5.1-cm) steel tubing. Equipment gate leaves shall lock into an ice dam by means of a minimum 0.5625-in. (1.43-cm) diameter sliding cane bolt. Each leaf shall have a 90° angle of steel tubing, ½ in. (1.27 cm) of which shall be locked in the floor. Each equipment gate and access gate over 3 ft (91.4 cm) wide shall be equipped with adjustable spring-loaded swivel casters.

4.4.4 Where operation of the gate latch is required from the ice side of the doors, a push-button shall be flush mounted in the caprail to activate the latch system. The button shall be large enough to be operated by players wearing gloves, approximately 1.5 in. (3.81 cm) × 5 in. (12.7 cm). The push-button shall be designed to be simple to operate, yet not allow accidental opening.

4.4.5 *Hinges*—All hinge assemblies shall be constructed of low-carbon steel. The common hinge bracket shall be bolted to the dasher panel framing to facilitate removal of the hinge.

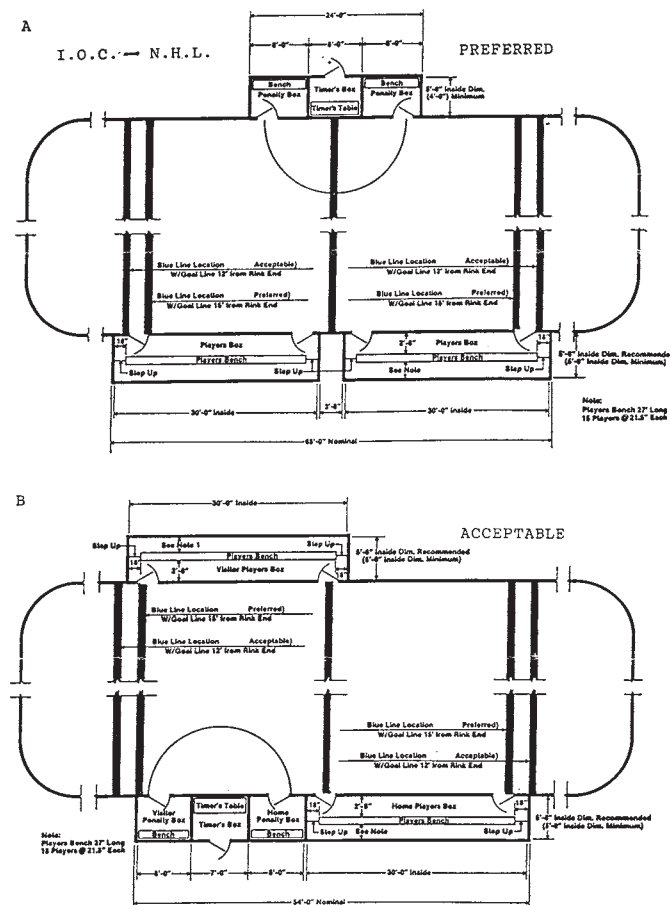


FIG. 1 Rink Layout