



REMR Technical Note HY-N-1.9

Icing Reduced with Miter Gate Recess Wall Heaters

Purpose

The purpose of this technical note is to describe a method of preventing ice buildup on miter gate recess walls.

Equipment, Tools, and Personnel Requirements

A concrete drill and regular hand tools are required to install the heater panel. A heater panel is 1-1/4 in. by 48 in. by 96 in. and weighs about 300 lb. Attaching a panel to the concrete wall can be accomplished with two or three men working from a boat or barge. A small hoist or come-alongs could be used to position the panel prior to mounting.

Applications and Limitations

Ice can adhere tenaciously to rough concrete, and ice buildup on the concrete walls of miter gate recesses can prevent the gates from being recessed. The ice collar that commonly forms on the wall is usually chipped off manually. To prevent this ice buildup or to shed the ice after it has formed, heater panels can be attached to the wall as illustrated in Figure 1. A detailed drawing of a heater panel is shown in Figure 2. The self-regulating heater cables provide enough heat to shed an ice collar that has grown on the panel. A 12-in.-thick collar can usually be shed in less than an hour. To prevent ice from growing on the panel, the heat cables would have to be operating continuously during cold weather. It is important that the mounting screws be flush with the panel. If bolt heads or studs protrude beyond the panel, ice adhering to them will delay shedding of the ice.

Working Drawings

A full set of working drawings, eight in all, can be obtained from the point of contact. These drawings give details of fabrication and installation. A description of the techniques for making waterproof connections between the heat cables and waterproof wires leading to the 240 VAC supply can also be obtained.

Step-by-Step Procedure

The procedure for fabricating a panel is described on the eight working drawings. After a panel has been fabricated, holes are drilled in the panel for mounting. These 9/16-in. holes should be at 16-in. spacings and countersunk for 1/2- by 3-in.-long flathead Tapcon screws or equivalent. After the panel has been placed in position with the 8-ft side horizontal, the holes are used as a guide for drilling 1/2-in. holes in the concrete wall. The top of the panel should be 6 in. above the upper pool level. Multiple panels can be placed next to each other in the miter gate recess.

Advantages

The heater panels can be used to prevent ice growth or to shed ice that has grown in the miter gate recess. If ice has been shed, it can be flushed out of the recess with air screen bubblers if the recess is equipped with them. If a heat cable fails, it can be easily replaced by pulling the cable and connecting wire out through the bottom of the panel (see working drawings for complete details). A replacement can be installed by pulling it up from the bottom of the panel. Keeping the recess free of ice will permit complete recess of the miter gates during cold weather. This procedure can eliminate the need for manual chipping of the ice and provide efficient operation of the lock.

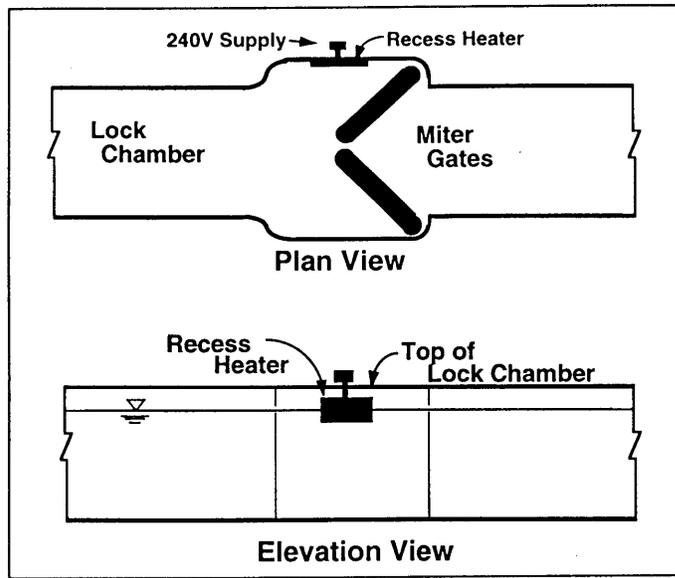


Figure 1. Miter gate recess heater attachment

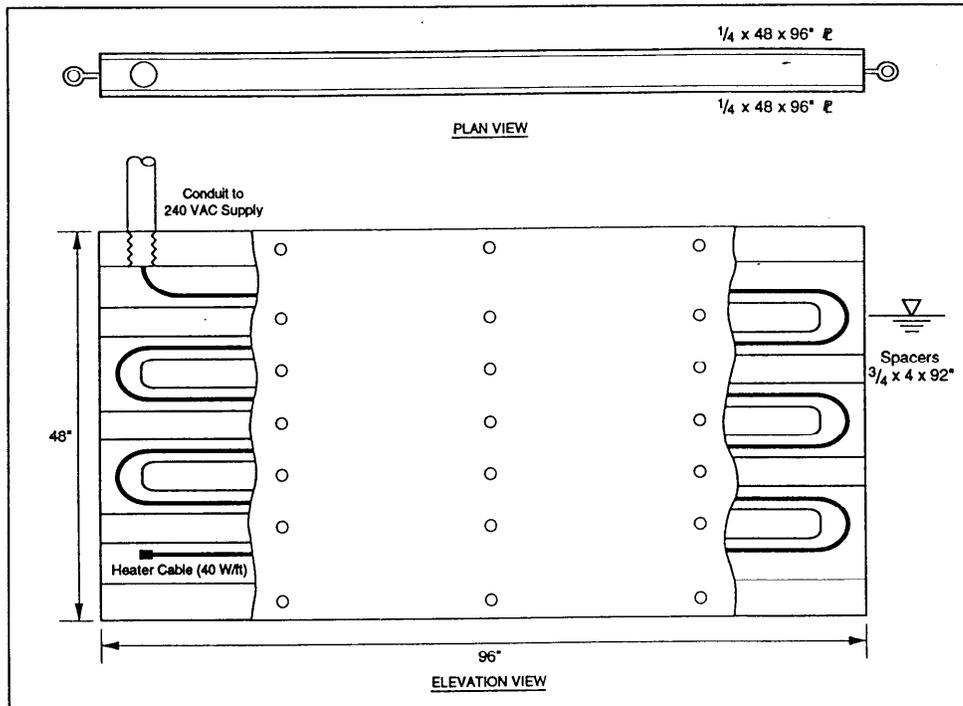


Figure 2. Recess heater detail