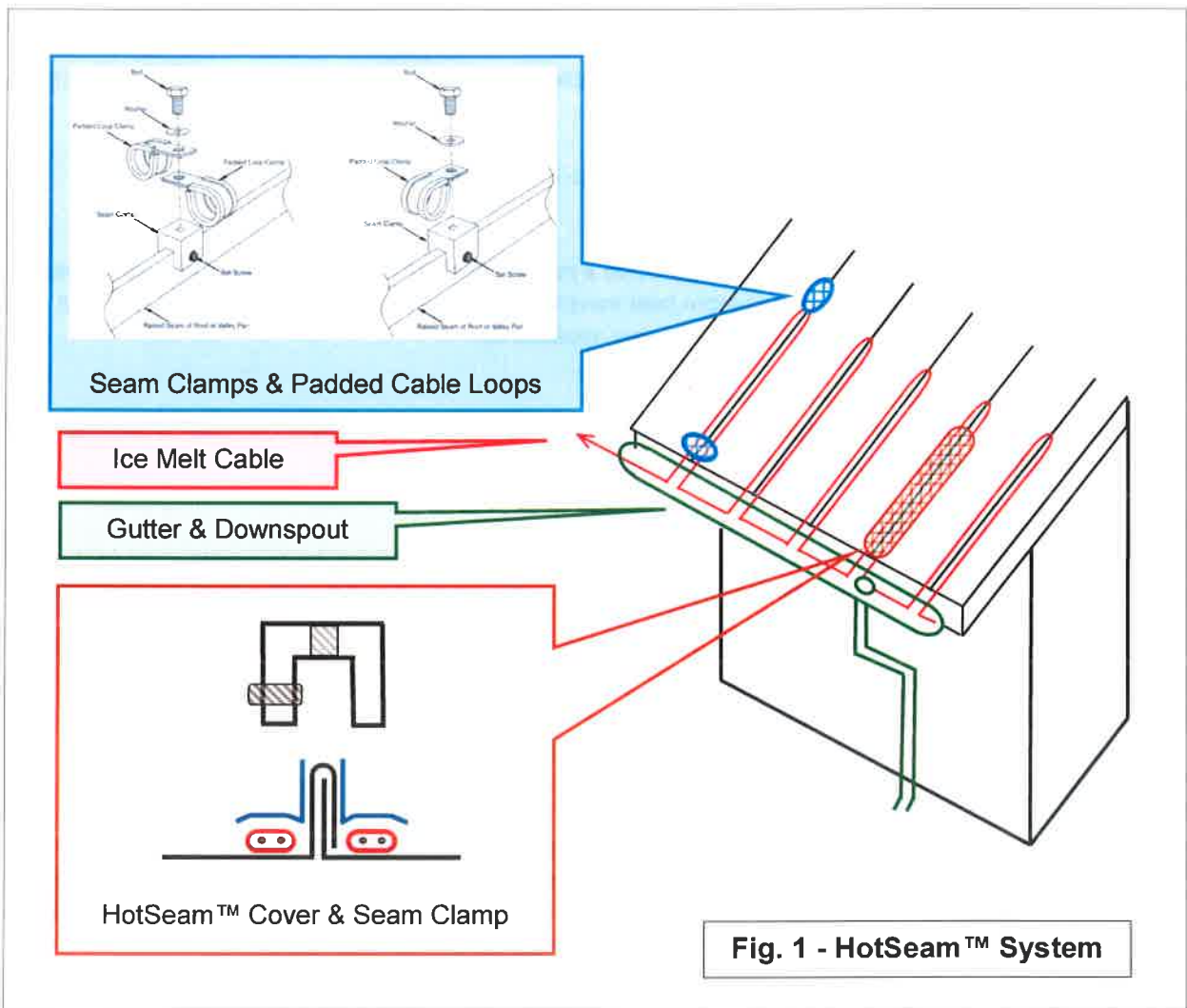


## HotSeam™ System - Installation Instructions

Ice Melt Cable Retention System

Hot Edge, Inc.

[www.HotEdge.com](http://www.HotEdge.com)



The HotSeam™ Ice Melt Cable Retention System was designed for metal roof surfaces and provides a Seam Clamp and a Padded Cable Loop assembly that securely attaches vertical ice melt cable runs on most raised seam roof surfaces. The HotSeam™ Cover holds the ice melt cable against the roof surface and provides an attractive street view appearance. Optional flashings with raised seams are available for most applications.

The HotSeam™ System – Design Guide is also available for a complete documentation package.

## Overview

Exposed ice melt cables with glued down retention clips on metal roofs have been the conventional way to drain ice dams for many years. The patent pending products from Hot Edge Inc. have taken the art to a new level. High snow load regions now have a low cost and reliable alternative to the traditional vertical ice melt cable retention approach.

**Raised Seam Clamp and Padded Cable Loop** products securely attach vertical ice melt cable runs on most roof surfaces. This method is much more reliable than the glued down retention clips common in the industry.

**Optional Flashings** with raised seams are available for most applications including asphalt and dimensional roofing material.

**Seam Cover and Seam Clamp** products provide a method to press the ice melt cable against the metal roof surface. This retention provides more heat transfer to the metal surface resulting in a wider melt path. The covers also provide an attractive street view appearance.

### **NEC (National Electrical Code) Compliant**

The HotSeam™ Cover partially exposes the ice melt cable. This exposure is in compliance with the NEC and makes insertion, inspection and replacement an easy task.

### **Raised Seam Metal Flashings**

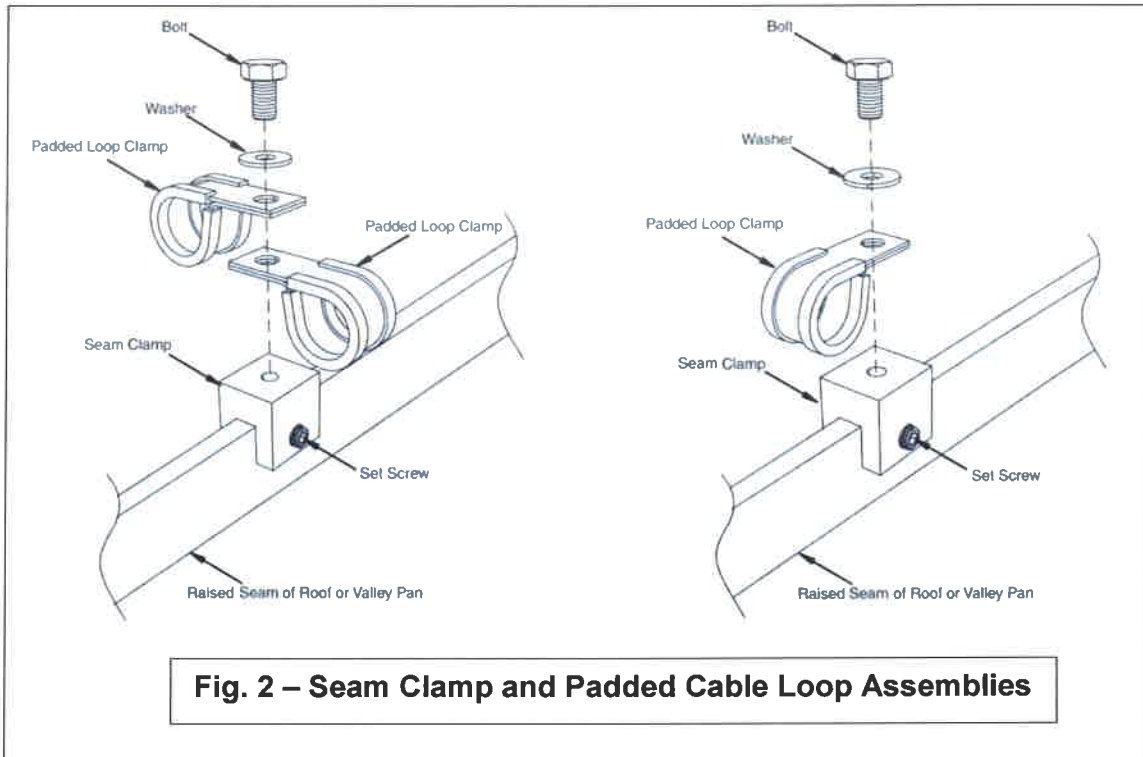
This System can also be used to create an ice melt cable retention system for serpentine (zig-zag) patterns, valley drainage pans between adjoining roof surfaces or other types of vertical ice melt cable placement requirements.

### **HotSeam™ System Applications**

- Metal roof – Attaches to the existing raised seam
- Shingled & Shake Roofs – Attaches to the raised seam of the valley pan
- Vertical Flashing – Attaches to the raised seam of a vertical flashing

**HotEdge™ Rails** for heating the drip edge and heated gutters and downspouts are always recommended for maximum protection against icicles and ice dams. Upper roofs are often neglected in the original architectural design and should also be upgraded. Many major icicle and ice dam issues can be traced to upper roof snow dumping onto lower roofs.

## HotSeam™ System



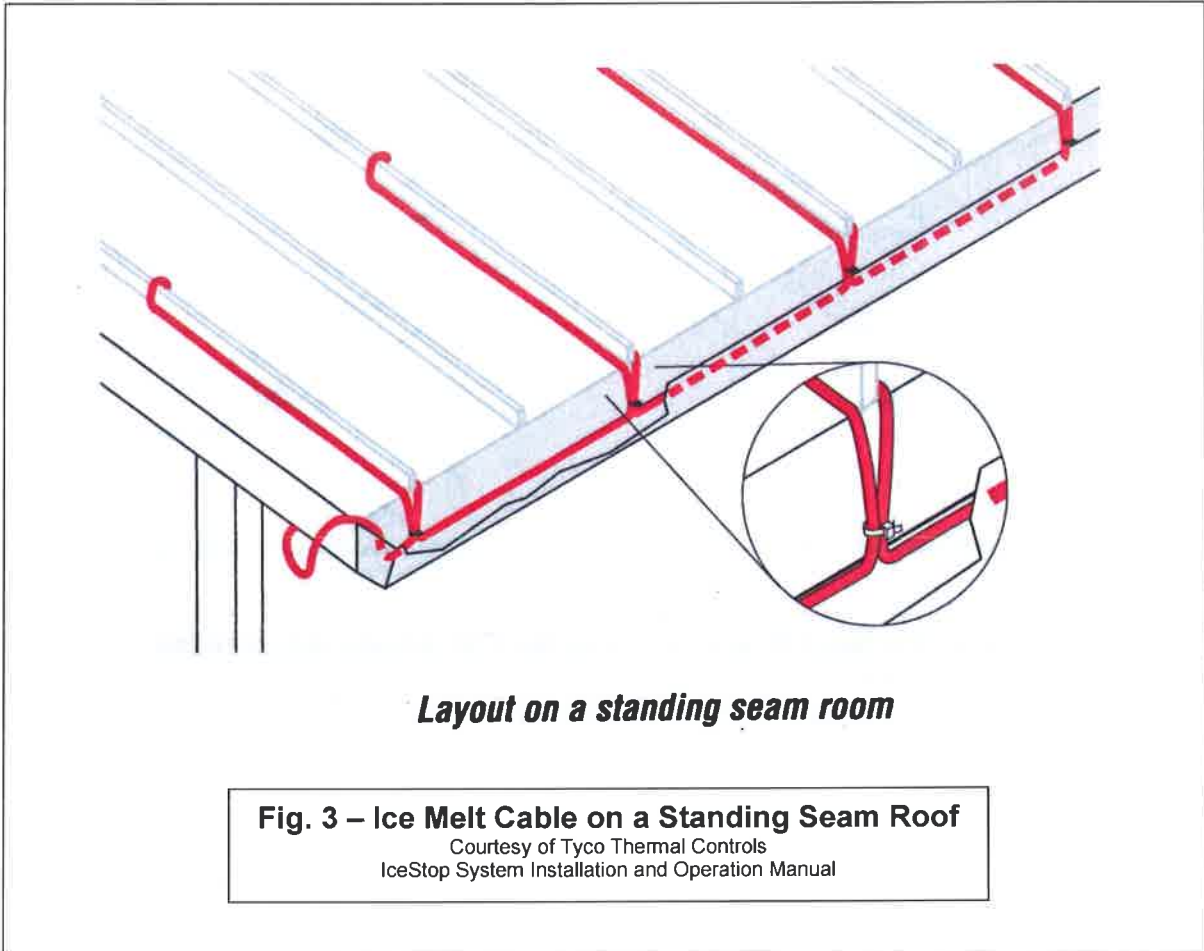
### Exposed Ice Melt Cable Retention

The HotSeam™ System is the ideal cable attachment method for raised seam metal roofs. This approach can also be used on any raised seam, including the special Raised Seam Flashing Products discussed in the following pages.

The mid-roof seam clamps and padded cable loops shown in Fig 2 retain the ice melt cable next to the raised seam. This is the type of installation recommended by most manufacturers of ice melt cable for raised seam metal roofs. This exposed cable approach has been used successfully for many years. The horizontal center to center spacing of these cable runs is covered in detail in the ice melt cable manufacturer's installation instructions.

At the same ambient temperature, self-regulating ice melt cable will use about twice the electrical energy when exposed to ice and snow compared to free air. When the ice and snow melts back away from the cable, two things happen. A hollow drain path through the ice dam opens and the standing ice melt water from higher up on the roof drains safely away from the structure. Since the self-regulating ice melt cable is no longer in direct contact with ice and snow, the electrical current used by the cable goes down. This exposed cable approach will save energy in an average installation.

## Installation Instructions



### 1) Determine Ice Melt Cable Spacing

**Vertical Runs** - In all cases, the Top Seam Clamp with a single Padded Cable Loop (Fig. 2) must be installed to retain the top loop of the ice melt cable. Vertically the clamps are usually placed about 12 inches past the exterior wall or snow retention device. In some cases, the cable runs can be taken to the top of the roof if required.

**Horizontal Spacing** – Every seam can be traced or seams can be skipped. The general rule is to space the runs two to three feet apart. In heavy snow load regions the spacing distance is reduced. To only provide snow melt water drainage paths use the larger spacing guidelines.

To remove large amounts of snow falling from upper roofs, every seam can be traced. In some installations, these cable runs can be extended to the top of the lower roof. For extreme conditions, the HotSeam™ Cover can be used to firmly press the cable to the metal roof surface which will maximize the heat transfer.

## 2) Seam to Seam Cross Over

**Note: Never run the ice melt cable horizontally, seam to seam, in the mid-roof area.**

Normally, the seam-to-seam cross over is done in the bottom of the gutter.

Run the cable from the bottom of the gutter up to the Padded Cable Loop at the top and then down to the bottom of the gutter. These two cables are then secured together with a UV-resistant cable tie.

### **Run to the Gutter**

The cable is then run in the bottom of the gutter to the next seam that will be traced and the process is repeated. This "run to the bottom of the gutter" requirement ensures a continuously heated melt path. An additional ice melt cable run is usually required in the gutter and always required in the downspouts.

It is sometimes permissible to cross the cable from seam to seam under the ridge cap if a retention Clamp and Loop is installed on both seams. If this horizontal seam to seam ice melt cable crossover is exposed to sliding snow and ice, the cable will be stretched, damaged, pulled away from the retention loops and cause an electrical hazard.

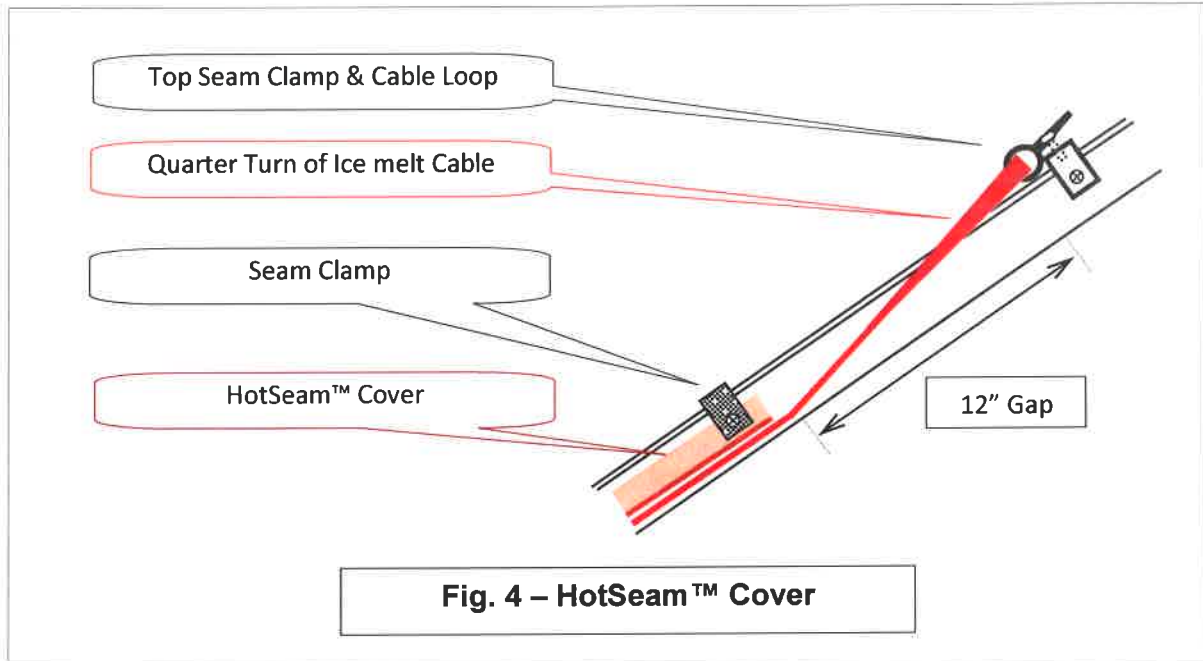
If there is no gutter, cable loops are extended about four to six inches passed the drip edge to maintain a heated drain path for the ice melt water. It is very important to make sure the dripping water does not re-freeze on the colder lower surfaces of the structure.

Heated gutters and downspouts are always recommended. Additional information and for cable runs without gutters is available in the ice melt cable manufacturer's installation instructions provided with the cable. The HotEdge™ Rail product, which heats the metal drip edge, is recommended for all these installations.

A three to four foot drip loop at each junction box allows a licensed electrical contractor to install the ice melt cable power feeds. An extra one foot at the dead end allows for the installation of the end cap outside the standing water in the gutter.

Home runs to junction boxes are always recommended. Ice melt cable splices have been shown to be unreliable and difficult to trouble shoot in the case of ground faults.

## HotSeam™ Ice Melt Cable Cover



### HotSeam™ Cover

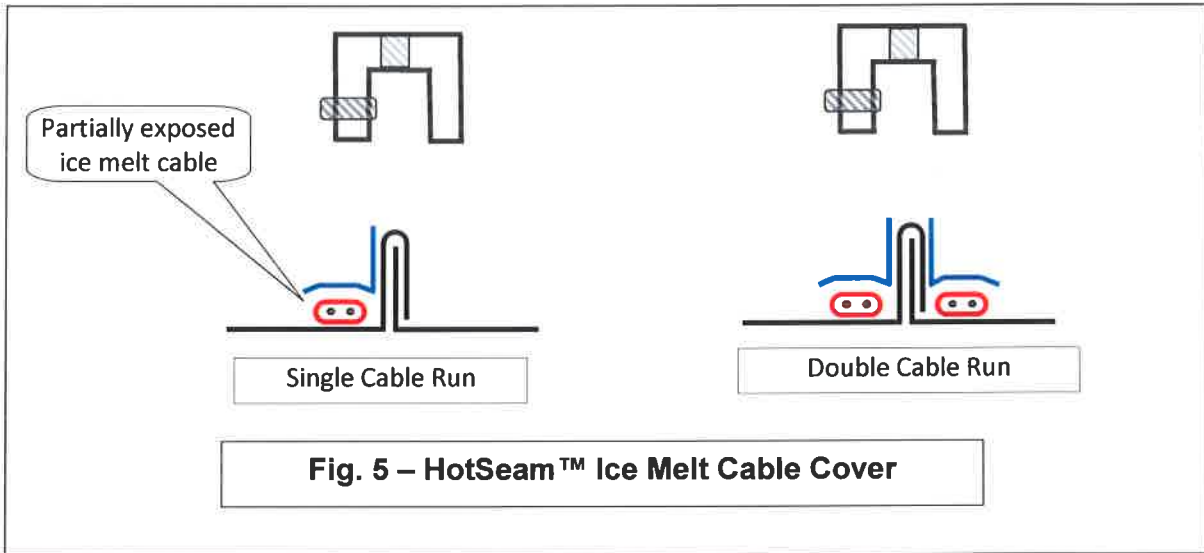
The HotSeam™ Cable Cover shown in Fig. 4 is similar to an upside down HotEdge Rail. The Cable Cover provides a pleasing street view appearance. The partial exposure of the ice melt cable meets the NEC Article 426 requirements. For non-metal roofs, the Raised Seam Flashing products are used in valleys or next to vertical walls to provide raised seam attachment points for the covers.

The covers insure a firm contact and maximum heat transfer between the ice melt cable and the metal roof or metal flashing. Using the covers will increase energy use because the self-regulating cable is always heat sinking to the metal roof structure. Energy usage will decrease after the snow and ice melts and is drained away but not to the level of the same cable in free air.

### The Hot Plate Effect

On the other hand, this firm contact can create a completely heated surface area. This is beneficial for smaller lower metal roofs in high snow load regions that have excessive snow dumping from larger upper roofs. Double runs on each raised seam can melt a very large volume of snow and ice.

## Installation Instructions HotSeam™ Ice Melt Cable Cover



### Overview

The top seam cable crossover retention loop, as shown in Fig 2, is required to retain the ice melt cable at the top of the cable run. Sliding snow and ice can pull the entire cable run away from the roof unless this attachment point is secure. A 12 inch transition gap, shown in Fig. 4, allows the ice melt cable to be twisted a quarter turn to enter the raceway under the HotSeam™ Cover.

- 1) Install the ice melt cable and top of the run Seam Clamp and single Padded Cable Loop as per the instructions in the previous section.
- 2) Each cable run must go to the bottom of the gutter to ensure a continuously heated drain path.
- 3) Install the ice melt cables so that they lay flat against the metal surface of the roof or flashing.
- 4) Important: The ice melt cable must not be twisted on the up and down runs. The HotSeam™ Covers require a flat surface contact with the ice melt cable (Fig. 5).
- 5) At the top of each run, allow a 12 inch space between the top of the HotSeam™ Cover and the bottom of the Cable Loop to allow a quarter turn of the ice melt cable. See Fig. 4 for details.
- 6) At the bottom of the run, the cable requires a quarter turn to make the horizontal right angle bend at the bottom of the gutter to run to the next heated seam (Fig. 3).

- 7) Place the HotSeam™ Covers over the ice melt cables and against the raised seam. The Covers may overlap if the jaw of the seam clamp is large enough. The cross sectional dimension will vary depending on the structure of the raised seam.
- 8) Secure the Covers to the raised seam of the roof by installing the larger Seam Clamps every 5 feet over the Seam Covers. Tighten the side screw on each Seam Clamp. See Fig. 5

## **Important Notes**

### **Seam Profile Drawings**

A very accurate raised seam profile drawing must be submitted to the sales department to order the correct Cover and Seam Clamp components. The objective is to make the cross sectional profile large enough to accommodate the Covers but small enough to minimize the downward shear force of the sliding snow and ice. Most raised seam profiles can be accommodated, but the information supplied by the contractor must be accurate.

### **Cover**

For the Cover, the vertical flange is available in different heights and can be trimmed at the job site. The overall thickness can be reduced by keeping the top of the Cover flange below the bottom of the increased thickness of the roof seam fold-over at the top of the roof's raised seam.

### **Clamp**

The Clamp needs to have a cavity large enough to accommodate the roof seam and four layers of the Cover's vertical flange.

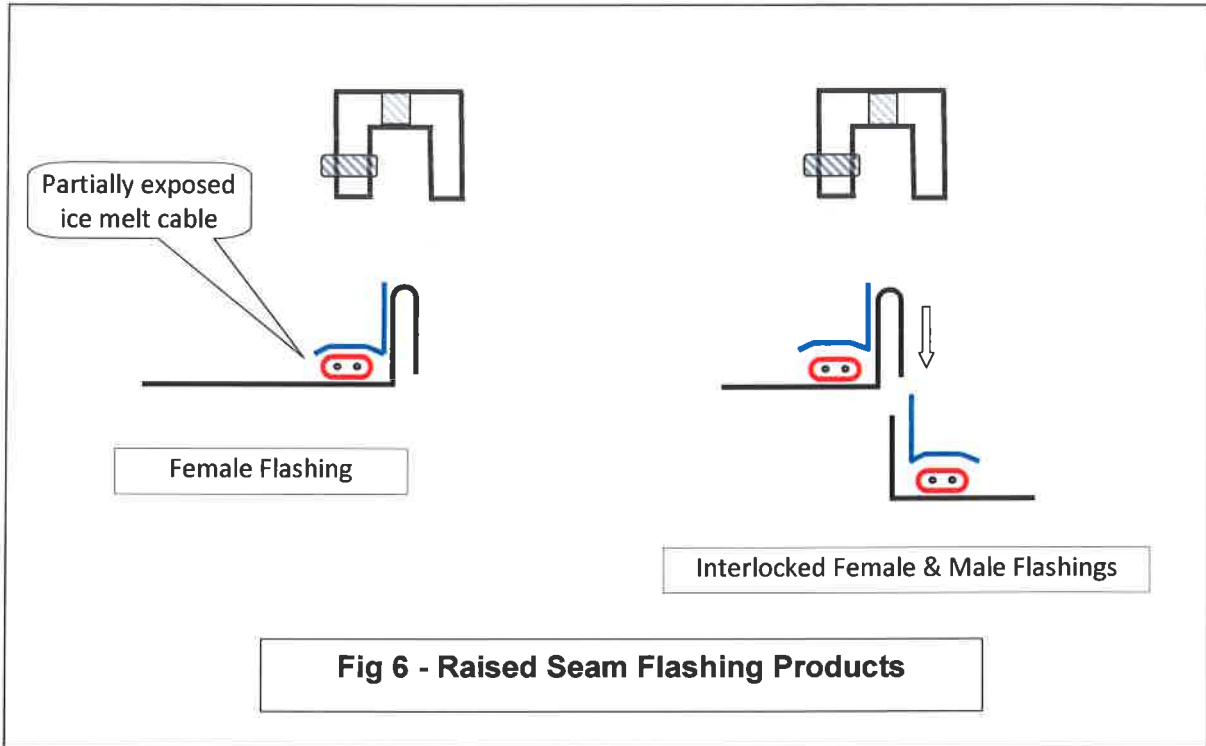
**The HotSeam™ - Design Guide** should be used with this **HotSeam™ - Installation Instructions** document for the complete information package to ensure a quality installation.

### **Cable Runs**

A single or double cable run can be used depending on the structure's topography. A double run is recommended for roof valleys in high snow load regions.



## Raised Seam Flashing Products



For non-metal roofs, the optional Raised Seam Flashing Products (Fig.6) are used in valleys or next to vertical walls to provide raised seam attachment points.

The standard Female Raised Seam Flashing is about five inches wide and slides under the adjacent shingle. It can be trimmed at the job site to minimize interference with existing nail or screw fasteners. It can be attached like a normal flashing with nails or screws sealed with roofer's caulk.

The optional Male Raised Seam Flashing can be added and are used to create a double sided raised seam. The increased horizontal surface provides a larger heated drain path. For a double run of ice melt cable, a double run of flashing is required.

The Male Raised Seam Flashing interlocks with the female flashing and slides under the shingles on the other side of the valley. In all cases the ice melt cable needs to be held down by the HotSeam™ Cover and the cable must be in contact with a lower metal surface formed by the flashing.

## Electrical Guide

Below is the maximum ice melt cable circuit length summation guide for the Tyco/Raychem IceStop 12 watt/ft cable typically supplied with the HotEdge™ Rail System. This information is only an overview and is not complete. Additional information is available from Tyco/Raychem – The IceStop System Installation and Operation Manual and the IceStop System Design Guide available at [www.tycothermal.com](http://www.tycothermal.com)

<b>Heating Cable Maximum Circuit Length Start-up Temperature of 0°F (-18°C)</b>				
Tyco/Raychem IceStop Heating Cable 12 watts/foot @ 32°F in snow & ice	15A Circuit breaker	20A Circuit breaker	30A Circuit breaker	40A Circuit breaker
GM-1X & GM-1XT at 120V	80ft	100ft	155ft	200ft
GM-2X & GM-2XT at 208 V	145ft	195ft	290ft	380ft
GM-2X & GM-2XT at 240 V	155ft	205ft	305ft	400ft
GM-2X & GM-2XT at 277 V	165ft	225ft	330ft	415ft

Very high start-up currents can be expected due to the self-regulating nature of this cable. Cold weather start-up peak currents for the entire system should be considered. Cold weather system start-ups due to the use of manual switches, timers, snow fall controllers or after a power outage can demand very high currents. In large multi-circuit systems, time delay relays for the individual circuits are recommended to prevent the master breaker from tripping.

EPD ground fault breakers with 30 ma trip points must be used for each individual power feed circuit, as per Article 426.28 of the NEC. The master breaker needs to be sized for the total peak currents encountered during cold weather start-ups.

Ice melt cable splices are not permitted in the HotEdge Raceway. Individual home runs to an electrical junction box are highly recommended. The use of ice melt cable splices should be minimized as they have been shown to be unreliable. Splices make troubleshooting and repair difficult and expensive. The expense of the extra footage of ice melt cable and additional junction boxes are an important investment.

Three extra feet of ice melt cable must be provided at each electrical junction box to allow the licensed electrical contractor to provide a drip loop and a power connection. At the end of the run, an extra one foot of cable is required for the installation of the end sealing device which should not be immersed in standing water. If this extra cable is not provided, the entire run of ice melt cable will need to be replaced. Cable is easy to cut but it does not stretch.

**Warning:** Low cost, constant current ice melt cable must not be used. Only safety agency Listed, self regulating ice and snow melt cable for structures that is provided with the system can be used. Consult with a licensed electrical contractor for system layout, junction box placement, maximum cable run lengths and power feed requirements as defined by the National Electrical Code (NEC), local building codes and the ice melt cable manufacturer.

## Important Notices

### 1) Self-regulating Heating Cable

Only self-regulating heating cable, designed for roof and gutter deicing and snow melting may be used with the HotSeam™ System. The ice melt cable manufacturer's instructions and procedures must be followed.

#### Products from Tyco Thermal Controls LLC (Raychem)

UL File KOBQ.E74811, De-icing and Snow-melting Equipment

CSA Class 2872-01, File 021133\_C\_000 HEATERS-Cable and Cable Sets

#### Raychem® IceStop® Roof & Gutter De-Icing Systems

GM-1X Heating cables (120VAC, 10 watts per foot)

GM-2X Heating cables (240VAC, 12 watts per foot and 277VAC, 12 watts per foot)

FTC-P Power Connection & End Seal Kit

FTC-HST Splice/Tee Connection Kit

GMK-RC Roof Clips

GM-RAKE Hanger Bracket

#### Raychem® WinterGard Wet Roof & Gutter De-Icing Systems

H612 Heating cables (120VAC, 6 watts per foot)

H622 Heating cables (208-277VAC, 6 watts per foot)

H900 Power Connection & End Seal Kit

H910 Splice/Tee & End Seal Kit

H913 & H914 Roof Clip Kits

H915 Hanger Bracket Kit

H908 120VAC Plug-in Power Connection Kit

#### Products from Chromalox Inc. (Thermwire-Melt)

UL File KOBQ.E137658 De-icing and Snow-melting Equipment

CSA Class 2872-01, File 056305\_0\_000 HEATERS-Cable and Cable Sets

SRF 5-1RG Roof and Gutter De-Icing Cable (120VAC, 6 watts per foot)

SRF 5-2RG Roof and Gutter De-Icing Cable (240VAC, 6 watts per foot)

RG-PK-1 Power Connection and End Seal Kit

RG-SK-1 Splice Kit

RG-EK-1 End Seal Kit

RCK-1 Roof Clip Kit

RDK-1 Downspout Hanger Kit

#### Products from Thermon Manufacturing Co.

UL File KOBQ.E163149 De-icing and Snow-melting Equipment

CSA Class 2872-01, File 079539\_C\_000 HEATERS-Cable and Cable Sets

RGS-1 Roof and Gutter De-Icing Cable (120VAC, 10 watts per foot)

RGS-2 Roof and Gutter De-Icing Cable (240VAC, 10 watts per foot)

PTK1A & RGS-CFK Power Connection and End Seal Kit

RGS-SFK Splice/Tee Kit

ETK1 End Seal Kit

## 2) Constant Current Ice Melt Cable

**Low cost, constant current ice melt cable must not be used.** This type of consumer installed ice melt cable does not self-regulate the heat output and may present a fire danger when placed in a grommet, clamp, under the HotSeam™ Cover or is overlapped.

## 3) Galvanic Corrosion

Both brass and aluminum HotSeam™ Clamps are available. The brass seam clamp should be used on copper roofs. The aluminum alloy seam clamp can be used on both steel and aluminum roofs. Contact of dissimilar metals can cause galvanic corrosion.

## 4) General Installation Guidelines

**IMPORTANT:** In all cases the ice melt cable manufacturer's instructions should be followed. The ice melt cable manufacturer's instructions override any instructions or suggestions from Hot Edge, Inc.

## 5) Home Runs to Junction Boxes

The ice melt cable has a life expectancy of between 5 and 10 years. Individual ice melt cable home runs to a junction box make ground fault isolation and future replacement easier and faster.

**Remember the Rule:** Cable cuts easy but it cannot be stretched.

## 6) Warning to Installation Personnel

Installation personnel must be skilled in the art and be aware of the dangers inherent in this type of construction work. This product is designed to be part of a complete roof structure. Only experienced professional licensed contractors should install this product.

## 7) System Test by the Electrical Contractor

### Insulation Resistance (Megohmmeter) Test

The insulation resistance test is critical to ensure the safety and reliability of the heating cable system. This test should be performed as part of the installation of the system. It is also useful for troubleshooting an installed system. This test is required for warranty coverage from some cable manufacturers. See details in the ice melt cable manufacturer's installation instructions.

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