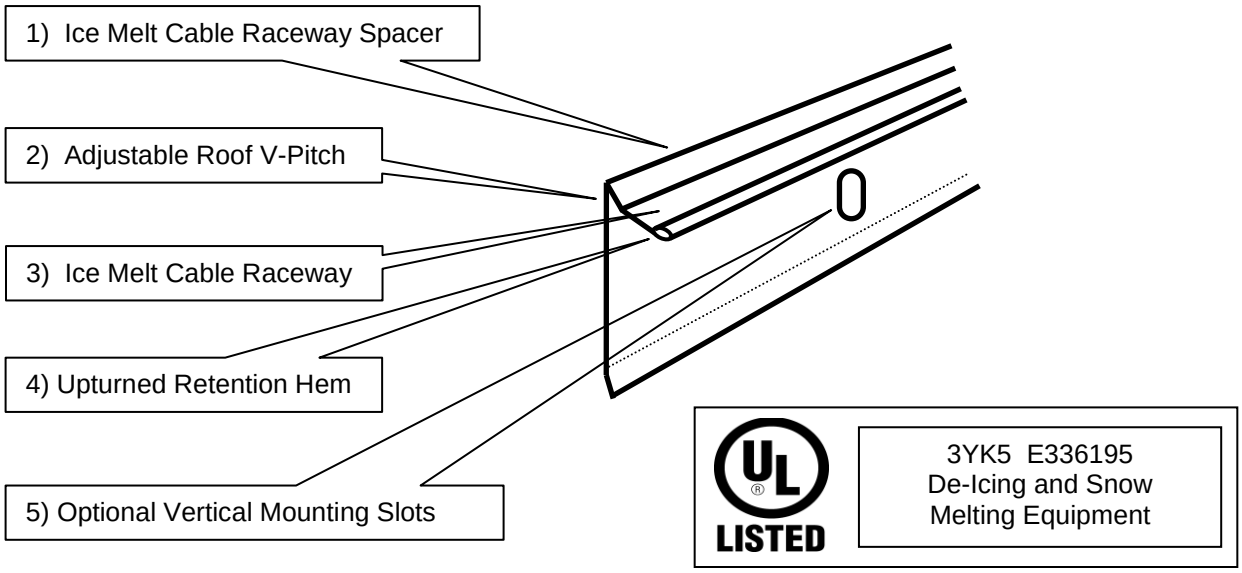
HotEdge™ Rail System – Design Guide

Order Entry Information & Engineering Specifications

Hot Edge, Inc. www.HotEdge,com



The HotEdge™ Rail – Roof Edge Ice Melt System

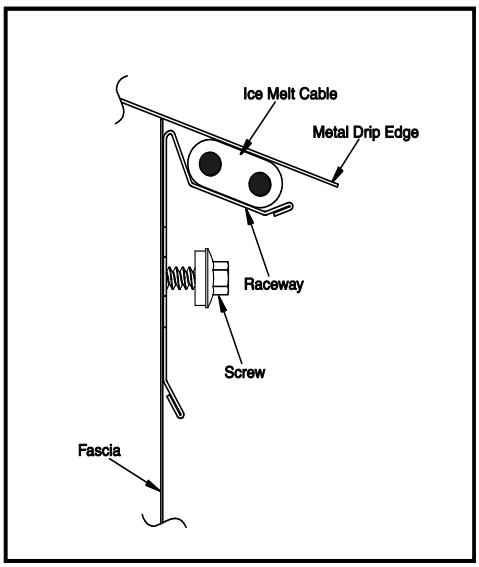
The HotEdge™ Rail creates a three-sided raceway that holds a single run of self-regulating ice melt cable firmly against the bottom of the metal drip edge of most structures. This patent pending open raceway design conforms to the NEC (National Electrical Code) Article 426 and provides access for insertion, inspection and replacement. The heat generated by the ice melt cable is directly conducted to the metal drip edge. This helps prevent icicles and ice dams from forming in this critical area.

Some roofs will require the addition of a metal drip edge or a metal slip sheet (snow slide) that can be heated. The optional HotSheet™ and HotShingle™ panels from Hot Edge Inc. are available for this purpose.

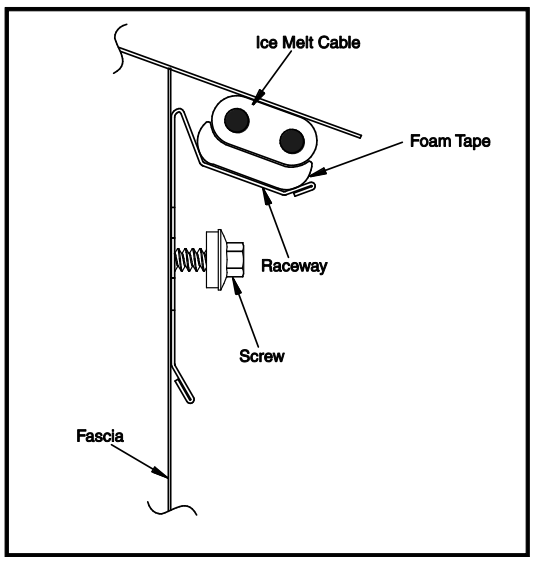
Note: In all cases, a one inch minimum metal drip edge must be present for the HotEdge™ Rail ice melt system to operate successfully.

Note: Specifications and tension guidelines are subject to change without notice. Before ordering material, insure the latest revision of this document is used.

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.



Mounting the HotEdge™ Rail Raceway & Ice Melt Cable



Foam Tape Option - Mounting the HotEdge™ Rail & Ice Melt Cable

The HotEdge™ Rail ice melt system is also available with a self-adhesive foam tape that can be applied to the HotEdge™ Rail, which may improve the transfer of heat from the ice melt cable to the metal drip edge. See above. The foam tape is installed in the HotEdge Rail raceway before it is mounted. Then the HotEdge™ Rail ice melt cable retention system installation instructions are followed to complete installation of the system.

Some roof drip edges are wavy (exhibit oil canning) and are not straight. This condition should be repaired prior to the installation of the HotEdge™ Rail. The foam tape can help to minimize any air gap, ensuring constant contact of the ice melt cable with the bottom of the metal drip edge.

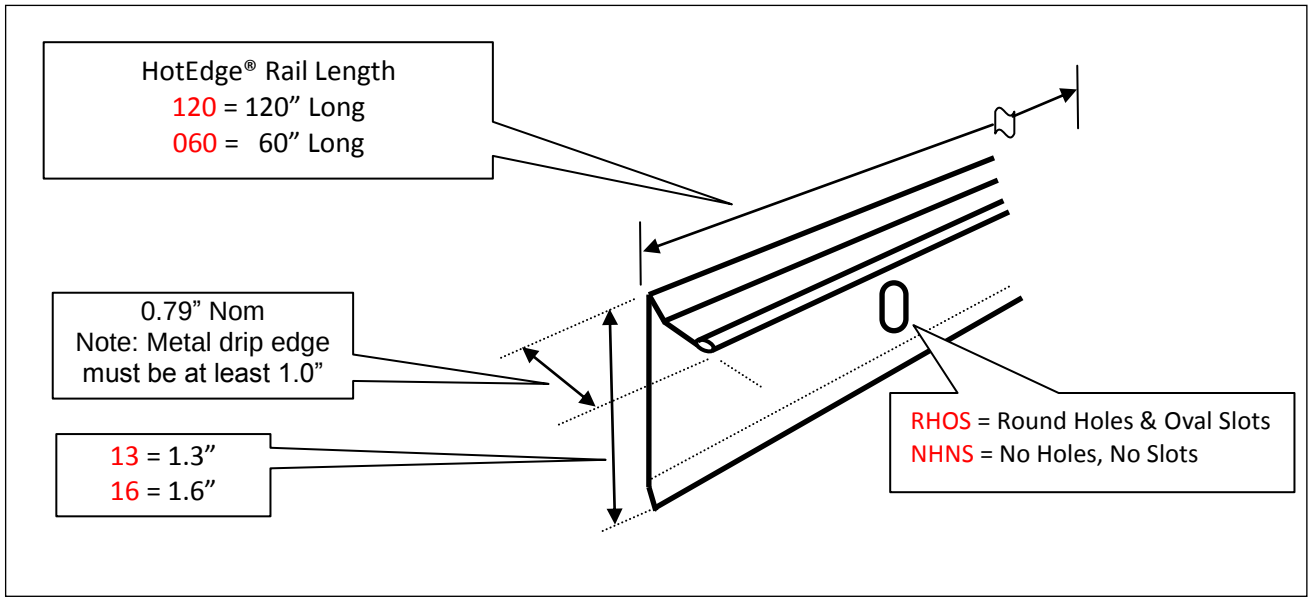
For winter installations, any ice under the drip edge fold-over must be removed. The slots can be used to mount the Rail and the powered ice melt cable which will melt any ice under the drip edge. The final tension adjustment can be made permanent with the insertion of additional screws.

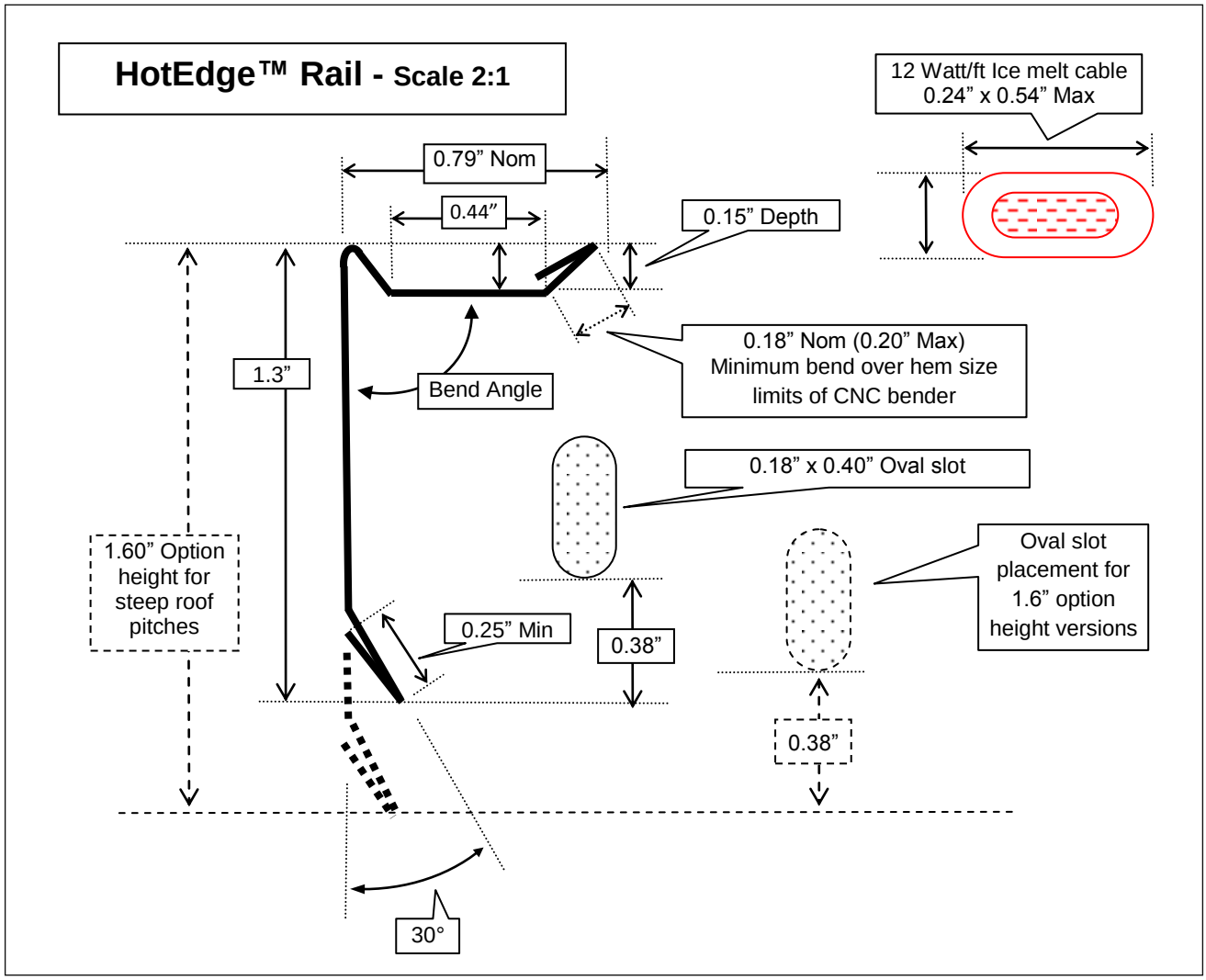
Overview

The overall objective is to keep the snow melt water in a liquid state until it is drained away from the structure's foundation. A heated gutter and downspout system is required for most applications.

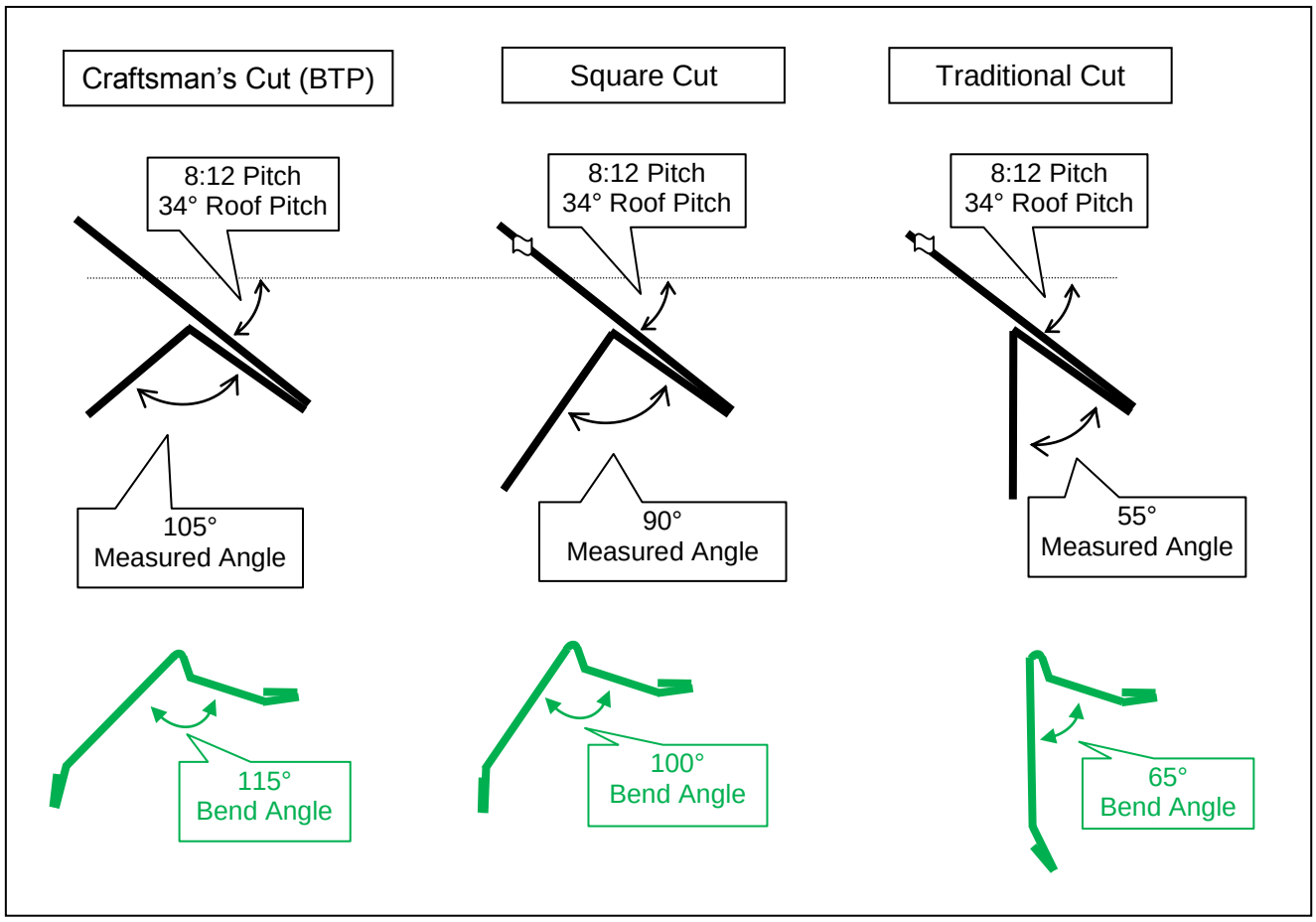
The heated drip edge will allow ice and snow to slide off the roof. The gutter placement needs to be below the slide plane of the ice and snow from the heated roof surface.

It is necessary to create a spring-like holding tension to eliminate any air gap between the HotEdge™ Rail raceway, the ice melt cable and the bottom of the drip edge. The "storm window effect" of any air gap in this critical area dramatically decreases the amount of heat that is transferred from the self-regulating ice melt cable to the metal drip edge and metal fascia.





Measured Angle Between the Fascia and the Drip Edge



Measured Angle

Some fascias are not vertical - they slope back toward the structure. Some fascias may have been replaced and are not plum. On a given structure, several different angles may be encountered. Each drip edge angle should be measured carefully.

In the three examples above, the roof pitches are identical at 8:12. The roof surface angle measured from the horizontal plane is 34° (degrees) in all three examples. However, depending on the fascia, the **Measured Angle** between the fascia and the bottom of the drip edge can be 105°, 90° or 55°.

There are a number of variables, including the oil canning of the drip edge. The various inside **Measured Angles** between the fascia and the bottom of the metal drip edge need to be measured to calculate the correct **Bend Angle** for the HotEdge™ Rail. It is recommended that an electronic digital protractor be used for this task. The General Tools & Instruments Model 1702 is a suitable instrument. Available at Lowe's (www.lowes.com).

Once the **Measured Angles** are known, the correct **Bend Angle** for the HotEdge™ Rail can be calculated. This procedure is covered on the next page.

Ice Melt Cable Retention Guidelines

Tension Angle

The **Bend Angle** of the HotEdge™ Rail is more than the **Measured Angle** between the structure's fascia and the bottom of the structure's metal drip edge. This is called the **Tension Angle**. This spring-like **Tension angle** is used to ensure the ice melt cable is firmly held in place under the metal drip edge.

Storm Window Effect

Air acts like a thermo insulator. Any air gap in this critical area creates a "storm window" effect which dramatically reduces the heat transfer from the ice melt cable to the bottom of the drip edge. During the installation process, wide jaw sheet metal vice grip pliers are used to squeeze the HotEdge™ Rail, ice melt cable and the bottom of the drip edge together. This **Tension Angle** that can vary between 5° and 20°.

Calculate the Bend Angle for Spring-Like Retention

For a steel HotEdge™ Rail, about 5-10° is added to the **Measured Angle** to create a spring-like retention for the ice melt cable. Copper is more flexible than steel, so the copper HotEdge™ Rail tension should be in the15° to 20° range. This will ensure a spring-like tension on the ice melt cable against the bottom of the metal drip edge.

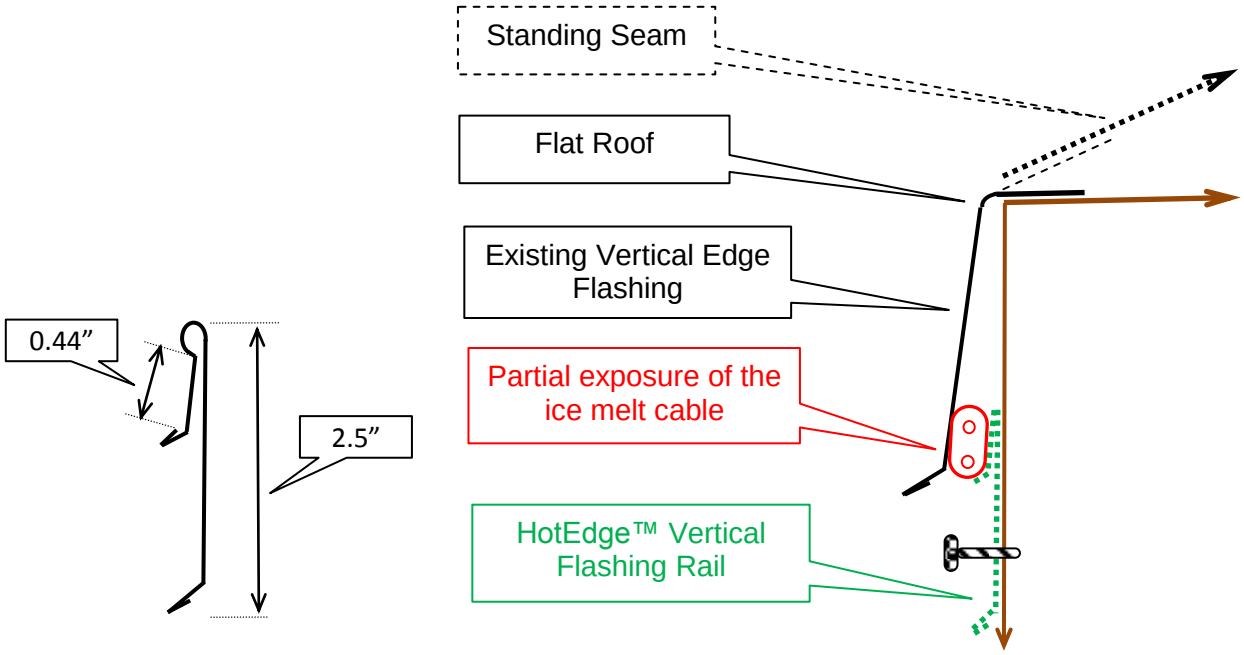
Roof Pitch Angle Chart – Ordering Information

Target Tension – Steel = 5-10°, Copper = 15-20°

* Most popular roof pitches

Roof Pitch Ratio	Roof Pitch Angle	**Measured Angle**	Bend Angle for steel Use part #	Bend Angle for Copper - Use part #	Bend Angle for Aluminum - Use part #
0:12	0°	**90°**	+10° HERLxx -100	+20° HERLxx -110	
1:12	5°	**85°**	+10° HERLxx -095	+20° HERLxx -105	
2:12	10°	**80°**	+10° HERLxx - 090	+20° HERLxx -100	
3:12 *	14°	**76°**	+9° HERLxx- 085	+19° HERLxx -095	
4:12 *	18°	**72°**	+8° HERLxx- 080	+18° HERLxx -090	
5:12	23°	**67°**	+8° HERLxx - 075	+18° HERLxx -085	
6:12 *	27°	**63°**	+7° HERLxx - 070	+17° HERLxx -080	
7:12	30°	**60°**	+10° HERLxx - 070	+20° HERLxx -080	
8:12 *	34°	**56°**	+9° HERLxx- 065	+19° HERLxx -075	
9:12	37°	**53°**	+7° HERLxx - 070	+17° HERLxx -070	
10:12	40°	**50°**	+10° HERLxx - 060	+20° HERLxx -070	
11:12	42°	**48°**	+7° HERLxx - 055	+17° HERLxx -065	
12:12 *	45°	**45°**	+10° HERLxx - 055	+20° HERLxx -065	

HotEdge™ Vertical Rail



HotEdge™ Vertical Rail for Vertical Flashings
Similar to the standard HotEdge™ Rail but higher (2.5”) and with much smaller **Bend Angle** to hold ice melt cable against back of the existing vertical flashing

The vertical roof edge flashing is common for flat roofs and occasionally found on other types of roofs. The bottom kick-out of the flashing serves as the drip edge. Snow melt can cause large icicles to form on the side of the cold vertical flashing. For new construction, this type of roof edge is not recommended for high snow load regions.

For existing structures, the HotEdge™ Vertical Rail holds the ice melt cable firmly against the back side of the vertical flashing. The heated flashing prevents the ice melt water from re-freezing on the flashing bottom kick out. Installation of a heated gutter and downspout is recommended to drain the ice melt water away from the structure’s foundation.

The ice melt cable is partially exposed for insertion, inspection and replacement as per the requirements of the NEC (National Electrical Code), Article 426.

Ice melt cable is placed on the top surface of the roof to provide a heated drain path for the ice melt water. Additional information on this standard zig-zag application that has been used for many years for flat roofs can be found in the installation instruction provided by the ice melt cable manufacturer..

HotEdge™ Rail – Harmonized Part Number Nomenclature

HERL13 — 090 — S - HAGR — 060 — RHOS — Rev20

Rail Products

HERL13 = 1.3" H
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Bend Angle

110 = 110°
105 = 105°
100 = 100°
90 = 90°
85 = 85°
80 = 80°
75 = 75°
70 = 70°
65 = 65°

110 = 110°
105 = 105°
100 = 100°
95 = 95°
90 = 90°
85 = 85°
80 = 80°
75 = 75°
70 = 70°
65 = 65°
60 = 60°
55 = 55°
50 = 50°

HotEdge™ Vertical Rail	**Bend Angle**
HEVR25 = 2.5"H	Fixed

The manufactured **Bend Angle** ensures a spring-like tension to retain the ice melt cable.
Note: Mounting screw placement is easier with the 1.6" high rails.

Material & Color

Material
C= Copper, 0.021", 16oz., ½ Hard

S= Painted Galvanized Steel, 0.019"

A = Kynar Painted Aluminum, 0.032"

+

Color
NAT = Natural Copper (For copper material)

ALMD= Almond
CLRD = Colonial Red
HMGR = Hemlock Green
SLBL = Slate Blue
BNWH = Bone White
COPE = Copper Penny
MNBN = Mansard Brown
SLGR = Slate Gray
MABL = Matte Black
DKBZ = Dark Bronze
MDBZ = Medium Bronze
CLGR = Classic Green
HAGR = Hartford Green
SRTN = Sierra Tan

Length

120= 120"

060= 60" (Note: 060 can be shipped UPS)

Options

RH= Round Holes, 2' Centers

or

NH= No Round Holes

+

OS= Oval Slots, 2' Centers

or

NS= No Oval Slots

+

BTP= Build to Print (Special Order Only)

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

Heating Cable Maximum Circuit Length Start-up Temperature of 0°F (-18°C)				
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.

Material Options	
Copper	0.021” (Nominal thickness). 16oz., ½ Hard Standard Roofing Grade
Steel	0.019” (Nominal thickness), 26ga Galvanized (G-90), SMP (Silicone Modified Polyester) paint per color chart Protective Film - Note: Protective Film must be removed before exposure to outdoor weather conditions.
Aluminum	0.032” (Nominal thickness) Kynar paint per color chart Protective Film - Note: Protective Film must be removed before exposure to outdoor weather conditions.