MONTANA
STATE UNIVERSITY

FACILITIES PLANNING, DESIGN & CONSTRUCTION
Sixth Avenue and Grant Street • P.O. Box 172760 • Bozeman, Montana 59717-2760
Phone: (406) 994-5413 • Fax: (406) 994-5665

REQUEST FOR PROPOSAL

Project Title: Cooley Laboratory Renovation
Location: Montana State University

PPA No.: 10-0023
RFP No.: 106
Date: April 13, 2013

To: Dick Anderson Construction
4498 Jackrabbit Lane
Bozeman, MT 59718

Attention: Platisha

From: Cecilia Vaniman, Project Manager
Cooley Lab Renovation
Montana State University

Attention:

In order to expedite the Work and avoid or minimize delays in the Work the following information is requested. Please return a response by: 04/22/2013

Date Sent: 04/15/2013
Date Received:

Proposal Requested:

PROVIDE GUTTER DOWNSPOUT SPLASH BLOCK AND HEAT TAPE AT NORTH ROOF

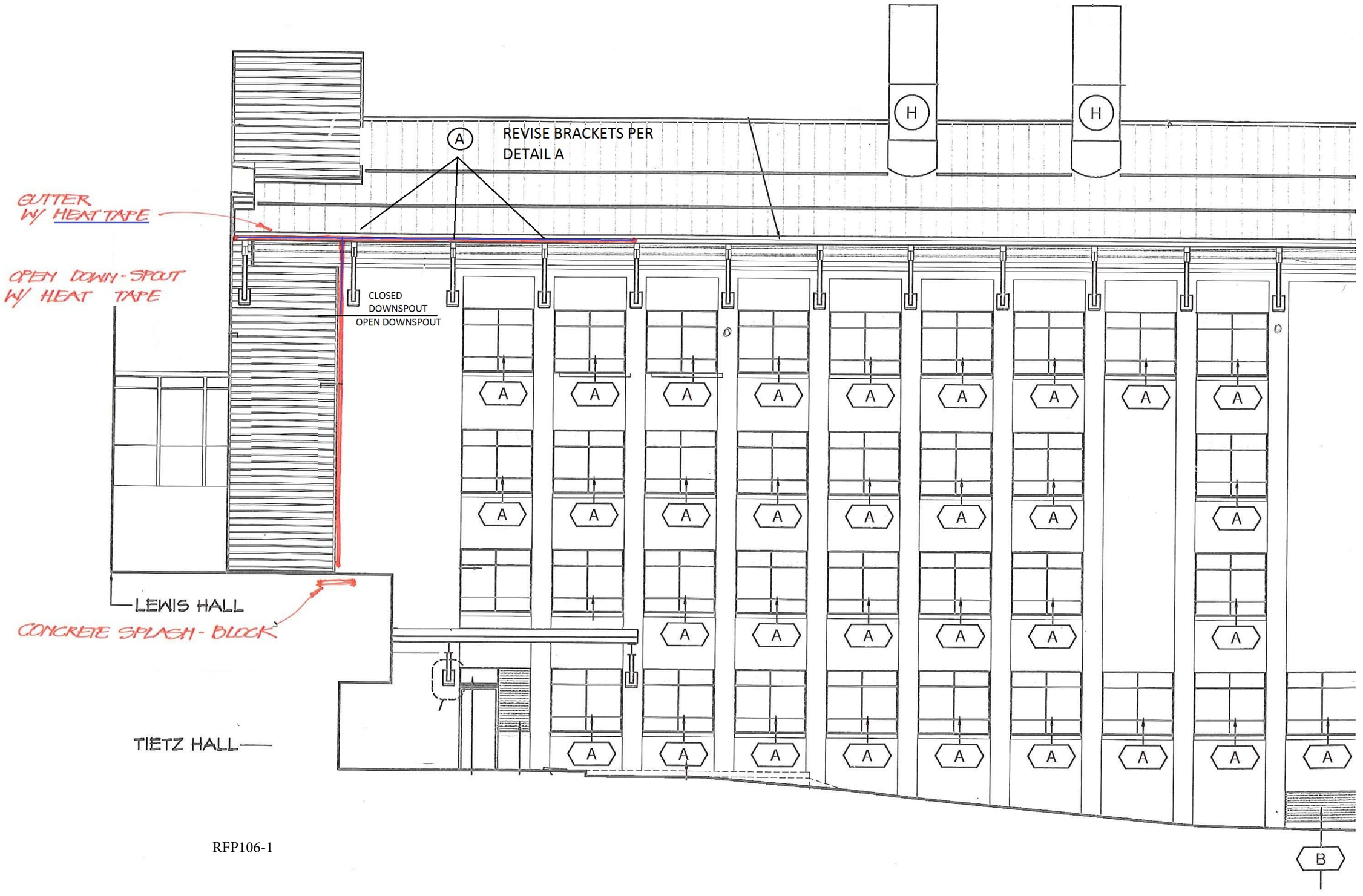
.
Scope of work includes; Division 05 - 07 & 16

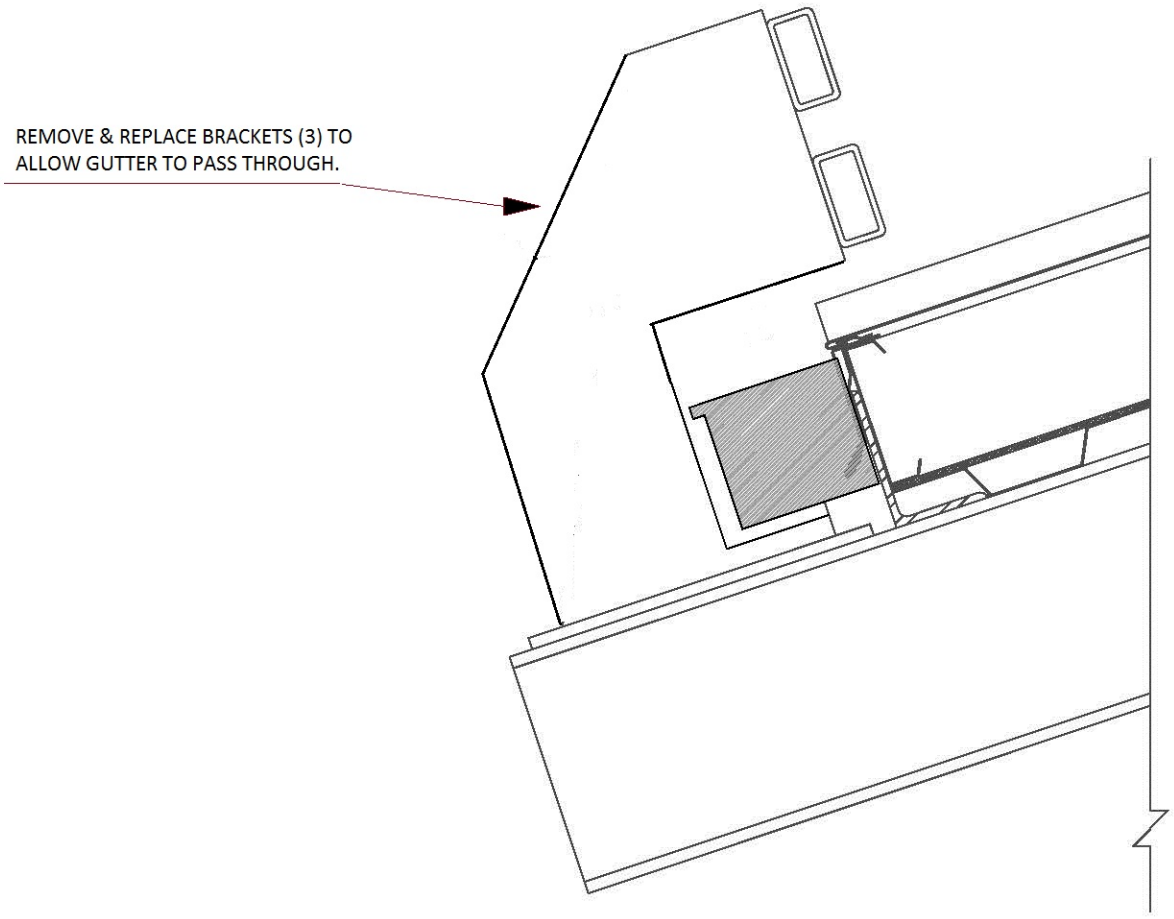
Provide and install approximately 32lnft of 18 ga (.040) gutter as shown.
Provide and install approximate 8 lnft of closed downspout and 20 feet of open downspout.
Provide and install one concrete 24" splashblock
Provide and install approximately 150 lnft of 277v self regulating heat tape include heat tape as shown on roof edge- gutter and downspout. Include an Automatic moisture/ temperature controller and accessories for roof-gutter and downspout connections.
Power for Heat Tape system to panel 'H5'. add a 20 amp, 1-pole breaker with 30mA GFI trip. Connect via 2#12 and #12 ground in 3/4" conduit

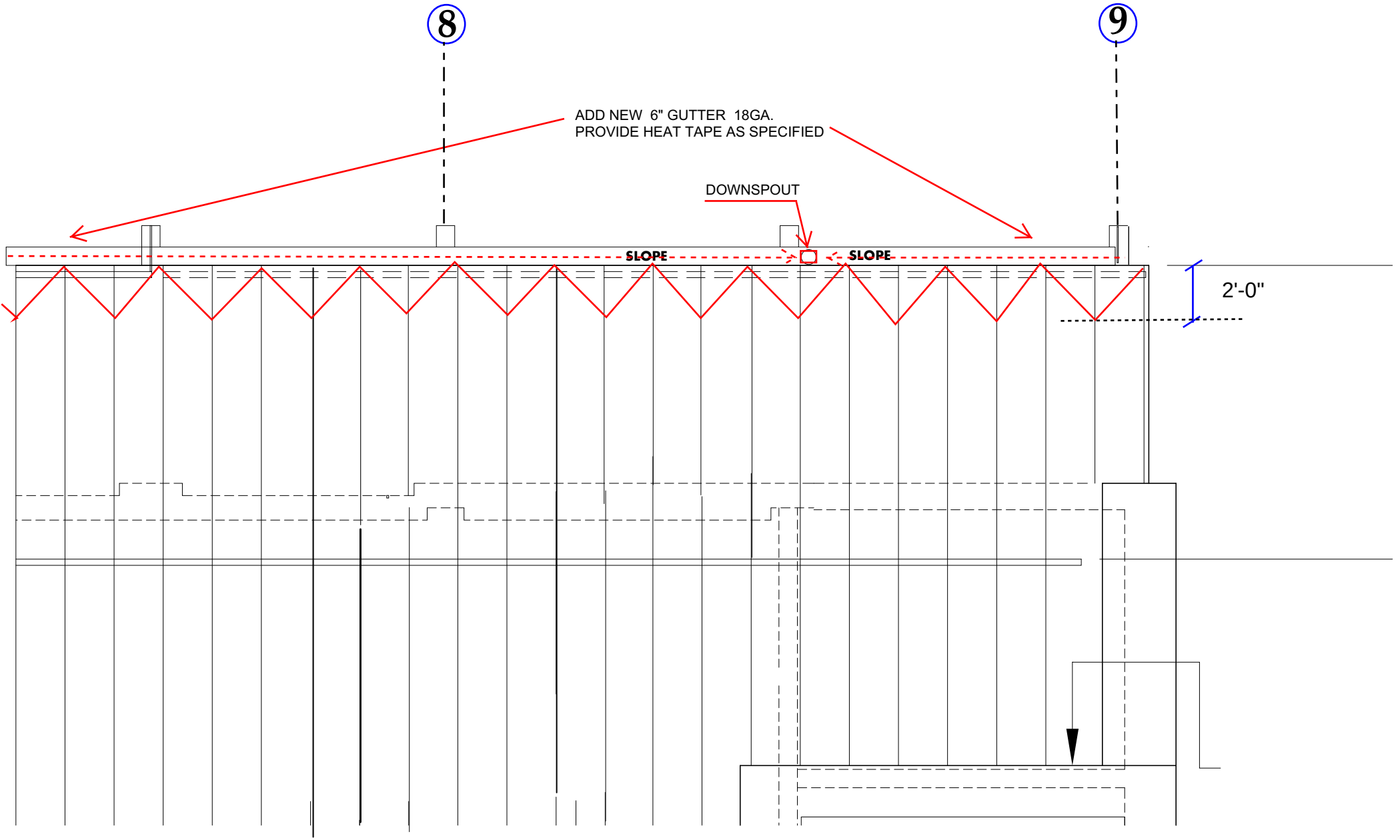
ATTACHMENTS: Sheets RFP106 1 through 11

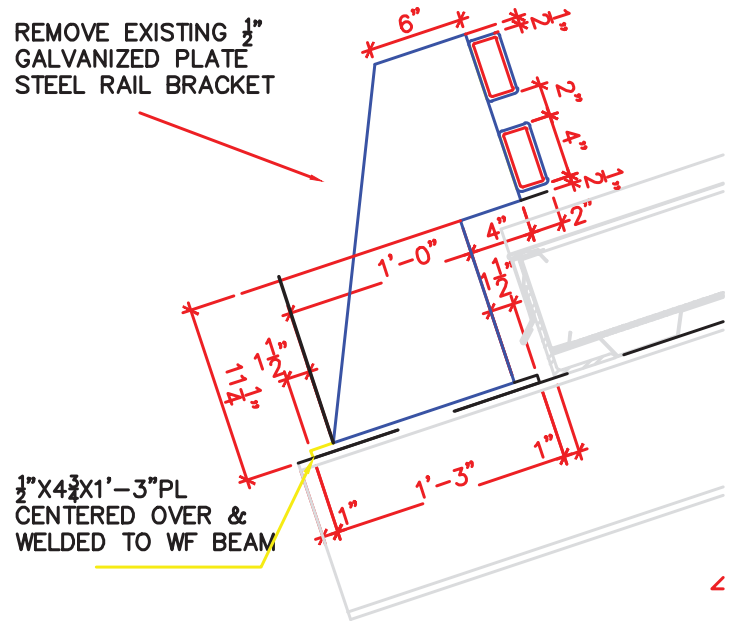
This RFP is for pricing purposes only. The contractor shall not proceed with the scope of work described within until pricing is approved by the owner in writing.

Distribution:
- ☐ Owner
- ☐ Agency
- ☒ Architect
- ☒ Contractor
- ☐ Engineer
- ☐ Other


REVISE BRACKETS PER
DETAIL A
A
H
H
GUTTER
W/ HEAT TAPE
OPEN DOWN-SPOUT
W/ HEAT TAPE
CLOSED
DOWNSPOUT
OPEN DOWNSPOUT
LEWIS HALL
CONCRETE SPLASH-BLOCK
TIETZ HALL
B

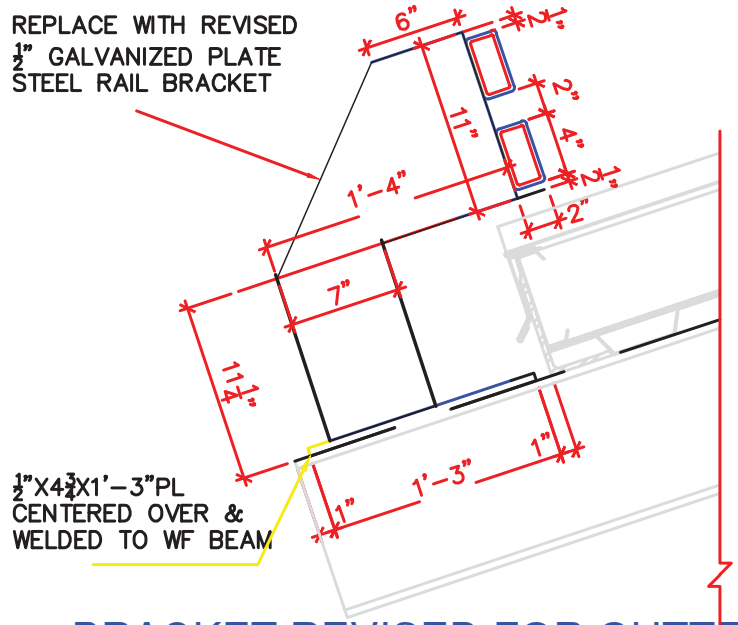

REMOVE & REPLACE BRACKETS (3) TO
ALLOW GUTTER TO PASS THROUGH.


8
9
ADD NEW 6" GUTTER 18GA.
PROVIDE HEAT TAPE AS SPECIFIED
DOWNSPOUT
SLOPE
SLOPE
2'-0"



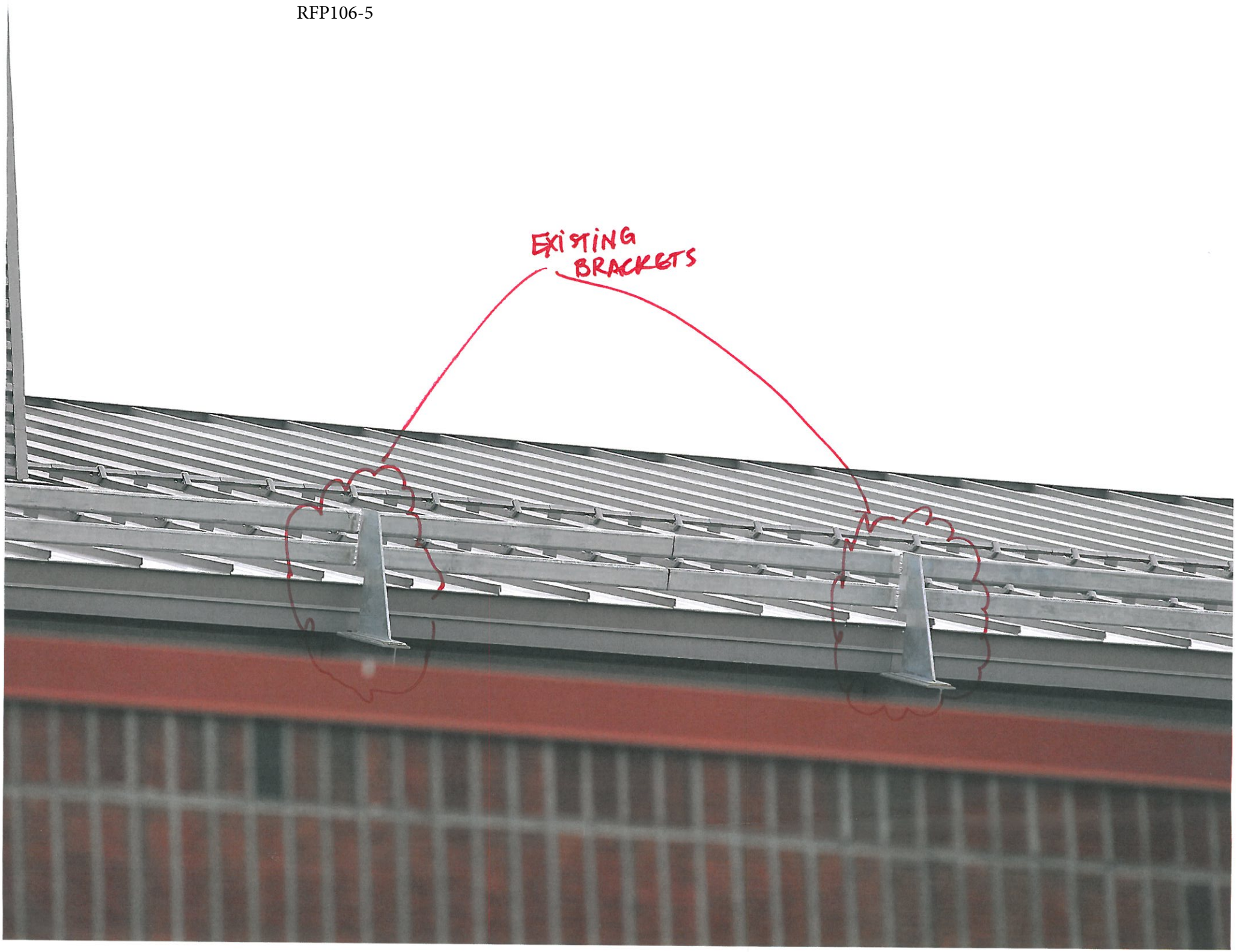
2 BRACKET REVISION - ORIGINAL

1 1/2"=1'-0"



A BRACKET REVISED FOR GUTTER

1 1/2"=1'-0"


EXISTING
BRACKETS

3 Heating Cable Installation

In wide gutters, snow and ice can bridge over the tunnel created by a single heating cable and prevent melt water from getting into the gutter and downspouts. To maintain a continuous path for melt water to run off, run the heating cable in the gutter as shown in Figure 13 below and follow the appropriate attachment recommendations in "Attachment Methods," page 29. Additional heating cable may be needed for the roof surface, downspouts, and valleys.

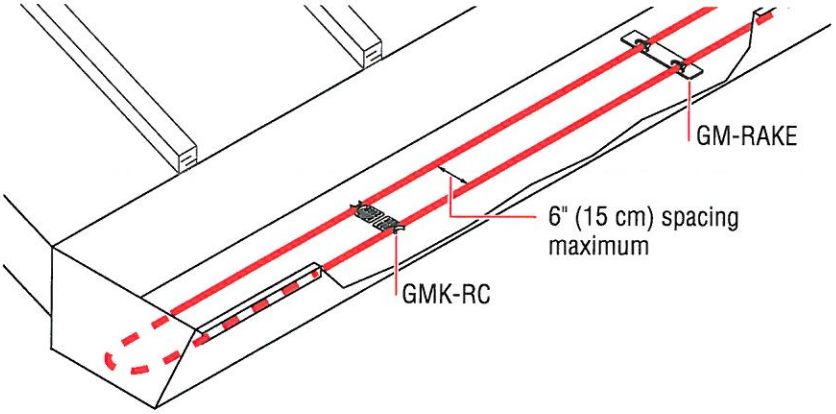


Figure 13: Layout in wide gutters–6" to 12" wide

3 Heating Cable Installation

Downspouts

Ice may form in downspouts and prevent melt water from escaping from the roof. To maintain a continuous path for melt water to run off, run the heating cable inside the downspout to the end as shown in Figure 14 and Figure 15 below. Follow the appropriate attachment recommendations in "Attachment Methods," page 29. Additional heating cable may be needed for the roof surface, gutters, and valleys.

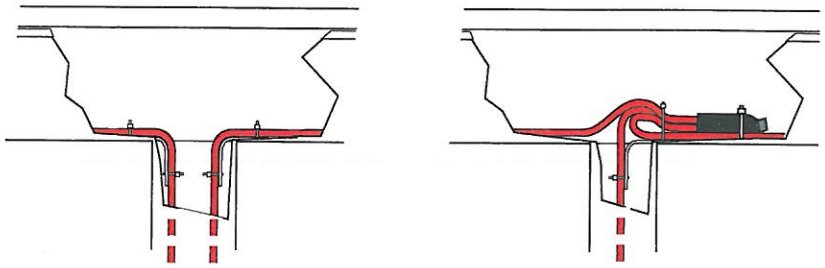


Figure 14: Heating cable at top of downspout

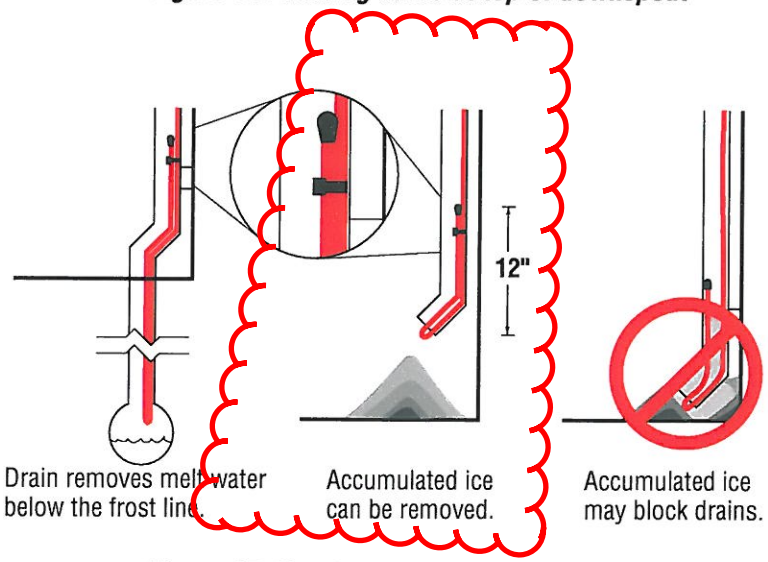


Figure 15: Heating cable at bottom of downspout

4 Attachment Methods

Belt Loop Approach

With the belt loop approach, strips of roofing materials are fastened to the roof using standard means for that particular type of roof. The heating cable is attached with a UV-resistant cable tie to the loop formed by this material.

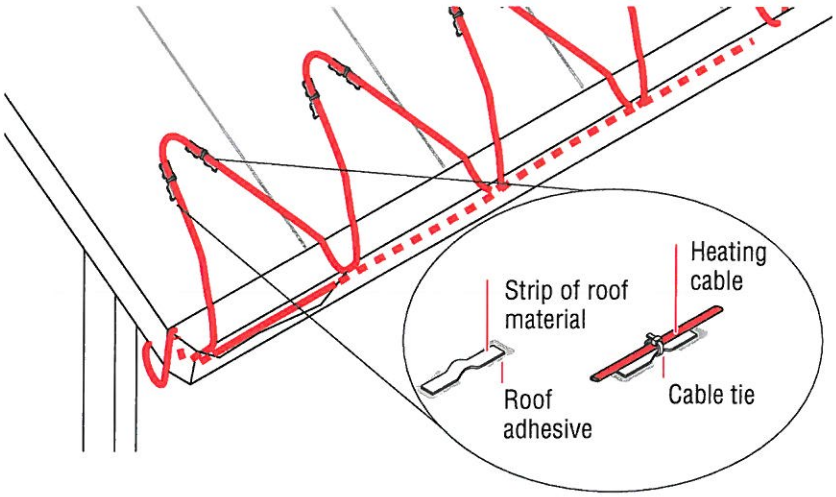


Figure 19: Belt loop approach on a sloped roof

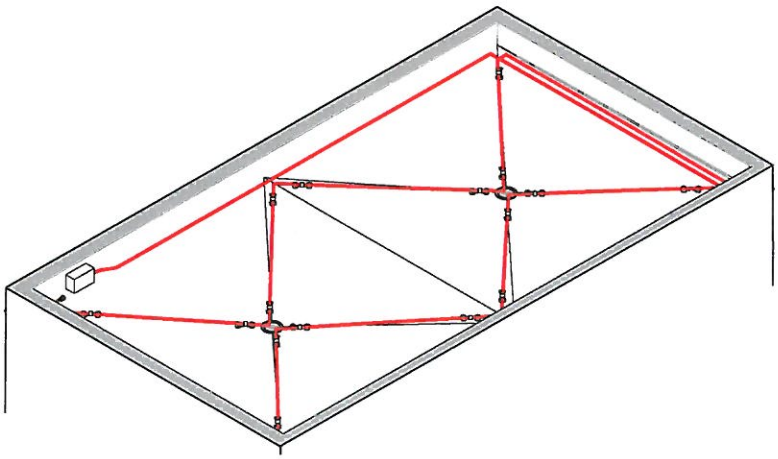


Figure 20: Belt loop approach on a flat roof

- The belt loop method of securing the IceStop heating cable involves using a small piece of roofing material to form a "belt loop."
- Use at least one belt loop for every 5 to 10 feet (1.5 to 3 m) of unsupported heating cable and at every heating cable change of direction.

Visit www.tycothermal.com for more information on our ten-year extended warranty.

Self-regulating roof and gutter de-icing heating cable

Raychem IceStop is a roof and gutter de-icing system that provides drain paths for the following applications:

- Roofs made from standard roofing materials, including shake, shingle, rubber, tar, wood, metal, and plastic.
- Gutters made from standard materials, including metal, plastic, and wood.
- Downspouts made from standard materials, including metal and plastic.

The heating element in the IceStop heating cable consists of a continuous core of conductive polymer extruded between two copper bus wires. As current flows through the core, the IceStop heating cable regulates its own heat output in response to ambient conditions.

This self-regulating feature eliminates hot spots and results in better temperature control to protect roof and gutter materials.

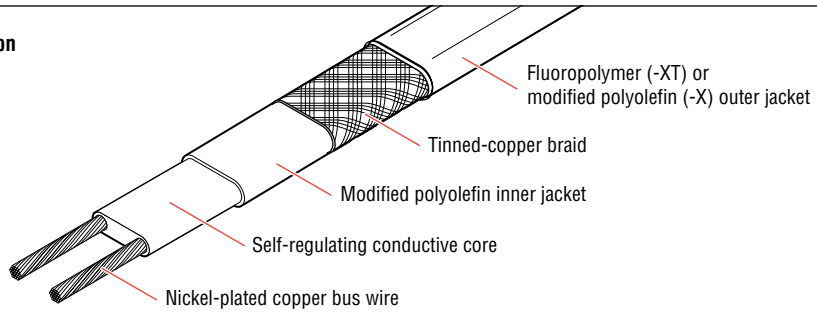
The IceStop heating cable is available with a fluoropolymer outer jacket (-XT) that provides maximum abrasion, chemical, and mechanical resistance; or a polyolefin outer jacket (-X) that is more economical for less demanding applications.

Low installed cost

The IceStop heating cable's parallel circuitry allows it to be cut to the exact length required, with no wasted cable.

All of these characteristics simplify and streamline the design of a roof and gutter de-icing system. Installation is quick and simple. The same features that make an IceStop system easy to install the first time also simplify additions or changes to the system during building renovations.

Heating cable construction



Catalog Number	GM-1XT and GM-1X	GM-2XT and GM-2X
Power Output (nominal)	12 W/ft (39 W/m) in ice or snow	12 W/ft (39 W/m) in ice or snow
Voltage	120 Vac	208–277 Vac
Minimum Installation Temperature	0°F (–18°C)	0°F (–18°C)
Minimum Bend Radius	5/8 in (16 mm)	5/8 in (16 mm)

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Maximum Circuit Length in Feet (Meters)

	Start-up temperature	Circuit breaker size 15 A	20 A	30 A	40 A*
GM-1XT and GM-1X at 120 volts	32°F (0°C)	100 (30)	135 (41)	200 (61)	–
	20°F (–7°C)	95 (29)	125 (38)	185 (56)	200 (61)*
	0°F (–18°C)	80 (24)	100 (30)	155 (47)	200 (61)*
GM-2XT and GM-2X at 208 volts	32°F (0°C)	190 (58)	250 (76)	380 (116)	–
	20°F (–7°C)	180 (55)	235 (72)	355 (108)	380 (116)*
	0°F (–18°C)	145 (44)	195 (59)	290 (88)	380 (116)*
GM-2XT and GM-2X at 240 volts	32°F (0°C)	200 (61)	265 (81)	400 (122)	–
	20°F (–7°C)	190 (58)	250 (76)	370 (113)	400 (122)*
	0°F (–18°C)	155 (47)	205 (62)	305 (93)	400 (122)*
GM-2XT and GM-2X at 277 volts	32°F (0°C)	215 (66)	290 (88)	415 (126)	–
	20°F (–7°C)	200 (61)	265 (81)	400 (122)	415 (126)*
	0°F (–18°C)	165 (50)	225 (69)	330 (101)	415 (126)*

* Only FTC-P power connection kits may be used with 40-A circuits.

Bus Wires	16 AWG nickel-plated copper
Braid / Outer Jacket	Tinned-copper braid with fluoropolymer (-XT) or modified polyolefin (-X) outer jacket
Dimensions	
Maximum width	0.54 in (14 mm)
Maximum thickness	0.24 in (6 mm)
Nominal Weight	92 lb/1000 ft (137 kg/1000 m)
Connection Kits	Raychem RayClic or FTC connection kits must be used with IceStop heating cables. Refer to the *Roof and Gutter De-Icing Design Guide* (H56070) for proper connection kit selection.

Approvals

877Z De-icing and Snow-Melting Equipment

-WS

Nonhazardous and Hazardous Locations Class 1, Div. 2, Groups A, B, C, D*

* For GM-1XT and GM-2XT

The IceStop heating cables are UL Listed, CSA Certified, and FM Approved only when used with the appropriate agency-approved Tyco Thermal Controls connection kits and accessories.

Ground-Fault Protection

To minimize the danger of fire from sustained electrical arcing if the heating cable is damaged or improperly installed, and to comply with the requirements of Tyco Thermal Controls, agency certifications, and national electrical codes, ground-fault equipment protection must be used on each heating cable branch circuit. Arcing may not be stopped by conventional circuit protection. Many DigiTrace control and monitoring systems meet the ground-fault protection requirement.