ZMesh Heating Element

Note: Always inspect the ZMesh for hairy edges or loose strands, cuts or other damage prior to and after installation; repair as required. Always conduct a continuity test between ZMesh and any metal in the area of the ZMesh and the Cold Leads. Complete the form "Heatizon Systems After Installation Element Test" immediately following the installation of the ZMesh, and immediately following any work that has been performed on the project which may affect the heating element. See the "Heatizon Systems After Installation Element Test" section of this Design and Installation Manual.

Note: Properly installed insulation is always recommended by Heatizon to enhance the efficiency and improve the performance of all Heatizon Systems products.

Note: Preparing a detailed layout of the element installation results in a superior installation. Preparing this layout on paper will save time and provide for a permanent record of the layout.

Note: To minimize the size of the flux lines or lines of force of any magnetic field given off by the ZMesh heating element, always run an even number of lengths of heating element and begin and end the heating element at approximately the same place.

3.1 General ZMesh Installation Instructions:

The function of the Transition Plate is to connect the bronze ZMesh heating element to the Cold Leads. Transition Plates may be terminated in the floor, in the wall, on the roof, on a deck surface, or in a joist space. Placement of the Transition Plates are done as follows:

Maintain 2" of space or more between Transition Plates. The location of the Transition Plates should be determined at the time the Cold Lead is installed. The spacing between Transition Plate's butt splices is dictated by the spacing between the ZMesh and the direction that the ZMesh runs from each Transition Plate**.**

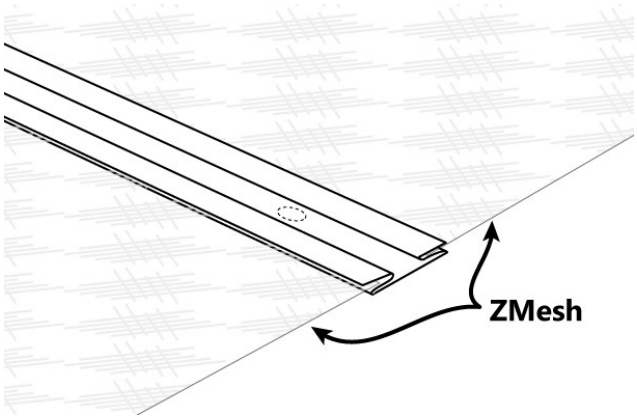
Install the Transition Plate(s) at the time the ZMesh element is installed. If it is necessary to install the Transition Plates at the same time as the Cold Lead, make certain that they are protected so that they will not get damaged, dirty, or painted.

Note: Non repaired cuts and loose strands of ZMesh will get red hot if energized, and will result in fire danger. Eliminate all loose strands of ZMesh prior to energizing your Heatizon product and repair all cuts. If ZMesh is cut, it must be repaired by using Heatizon Systems ZMesh Cut Out Kit (part # CUTOUTKIT) which must be properly installed.

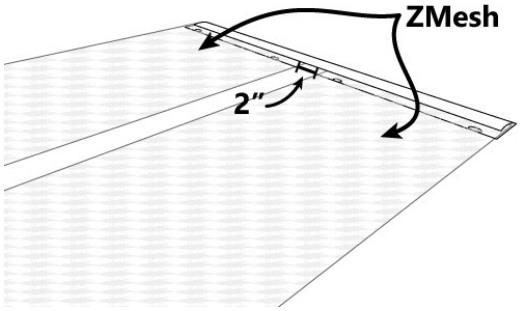
Remember: "After Installation Element Test" #1 should be conducted after the heating element has been installed, and "After Installation Element Test" #2 should be conducted following the covering of the heating element and immediately prior to installing the Control Unit.

TIPS FOR WORKING WITH ZMESH

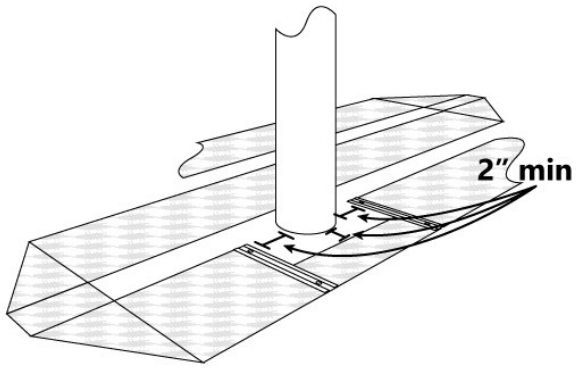
Splice Plate. On rare occasion, it may be necessary to splice the ZMesh element. Use a splice plate (Heatizon Part # E220Z). Follow the instructions in Section 7, “Making the Connection.”



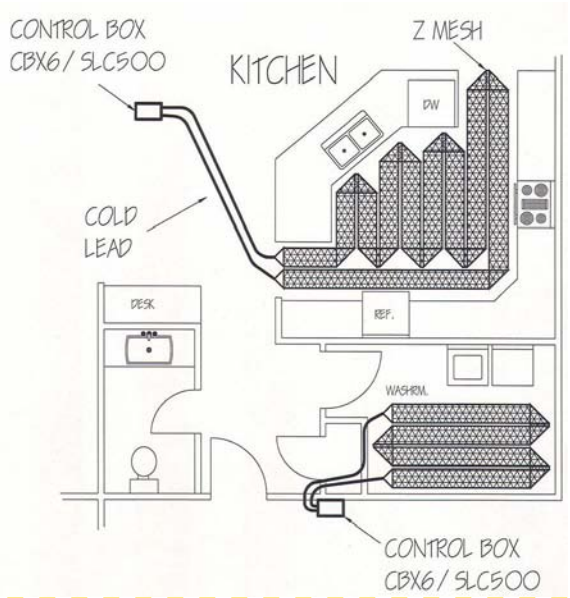
End Plate. Wherever a need exists to avoid having turns in the ZMesh, Heatizon 26" Splice Plate or End Plate (Heatizon Part # P1402) may be used. Follow the splicing instructions in Section 7, “Making the Connection.”



ZMesh Cut Repair. Always use a ZMesh Cut Out Kit whenever the ZMesh has been cut or damaged, or when needing to avoid a stationary object. Use Heatizon Systems ZMesh Cut Out Kit (Heatizon Part # CUTOUTKIT). Follow the instructions in Section 7, “Making the Connection.”

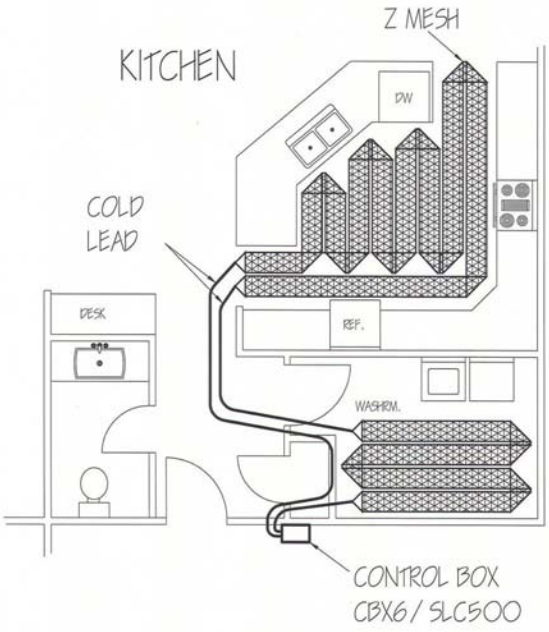


Planning the Layout — Three Sample Configurations of ZMesh Element



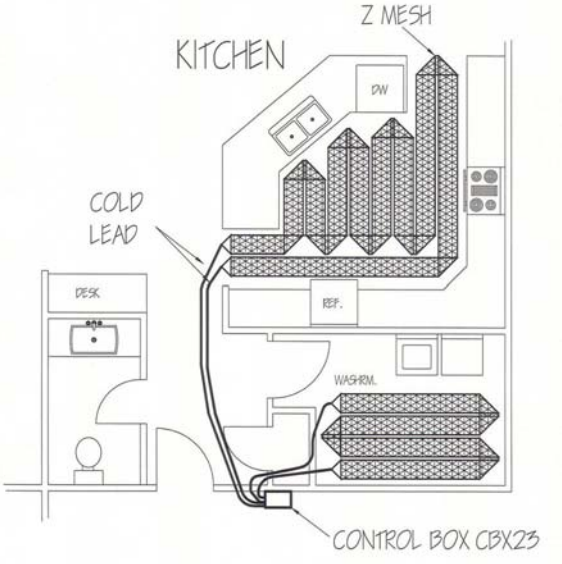
1.

ZMesh and Cold Lead for two separate zones, connected to two separate Control Units. One pair of Cold Leads has already been installed prior to ZMesh element installation. Each full sized heated area is connected to one standard CBX6, Radiant 8 or SLC500 series Control Unit.



2,

ZMesh and Cold Lead for two separate areas, which are connected in series by "jumpering" the areas together with Cold Lead (right) or with a wall plate (above). One pair of Cold Leads must have already been installed prior to ZMesh element installation. The two smaller areas are jumpered together and connected to one standard CBX6, Radiant 8 or SLC500 series Control Unit.

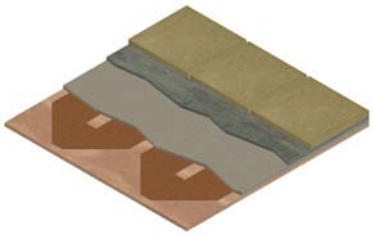


3.

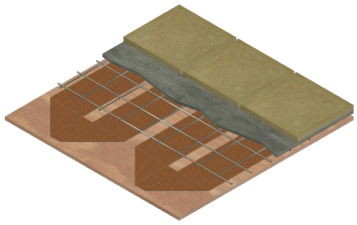
ZMesh and Cold Lead for two separate areas, which are connected to a 2X2 or 2X3 system. Two pairs of Cold Leads have already been installed prior to ZMesh element installation. The two full sized heated areas are connected to one CBX23 , CBX22 (double sided transformer), or Radiant 8 Control Unit as two separate, closed loop systems.

ZMesh Specific Application Guide

All applications using ZMesh heating element will utilize similar procedures for installing the element. Review your specific application installation procedures on the following pages before completing the element installation.



Section 3.1
General ZMesh Installation Instructions



Section 3.2
ZMesh Interior Installation

Section 3.3
ZMesh on Decks for Snowmelt Installation

Section 3.4
ZMesh Retrofit/ Staple-Up Installation

Section 3.5
ZMesh Roof De-Icing Installation

Your ZMesh application may require some of these Heatizon supplies and parts:

NI101	3M Skotchkote
NI102	3M23 Tape, 30' roll
NI103	3M33 Tape, 66' roll
NI110	Clamp Meter, Fluke 333
NI111	Crimper
NI113	Element Tester
NI147	Hammer Style Crimper
NI114	Ice & Water Shield
NI115	Infared Thermometer, Raytec MT2
NI116	Infared Thermometer, Westward
NI117	Insulation - Concrete Barrier Foil - 500 sf.
NI118	Insulation - Rigid - 4' x 8' x 1" sheet
NI119	Insulation - Slab Shield - 252 sf.
NI129	Solder, 40/60
NI130	Stapler, Screen
NI131	Staples, 3/8" - 5000 count
NI133	Weather Bond - 100 sf.
NI136	Wire Ties, 8" - 100 count
NI144	Drip Edge Protector
E217	Transition Plate with #2 Butt Splice
E218	Splice Plate, 12”
P1402	Splice Plate, 26”

Your ZMesh application may require some of these Heatizon System Kits:

CLDEXTKIT	Cold Lead Extension Kit
CUTOUTKIT	Z Mesh Cut Out Kit
JSTSCRKIT100	Joist Screen Kit - 100'
JSTSCRKIT250	Joist Screen Kit - 250'
JSTSCRKIT350	Joist Screen Kit - 350'
ENCLKIT	Enclosure Kit w/Back Plate

Your ZMesh application may require some of these tools and equipment:

Hammer
Tape measure
Marking pencil and chalk line
Crimpers
Wire Strippers and Cutters and/or Remesh Cutters
Razor Blade or Box Cutter
True RMS Clamp On Meter
Heatizon Roof Alarm (Part Number NI126)
Propane Torch

3.2 ZMesh Interior Installation

NOTE: Make certain that the surface area to be covered with ZMesh is smooth and flat. Prior to installing the ZMesh element, clean the areas to be covered of all dirt, nails, drywall, mud, etc.

Inspect the ZMesh element for loose strands as you go and be sure to cut them off and discard them. In the unlikely event blemishes are spotted in the ZMesh, return the entire roll to Heatizon Systems for replacement.

A. Beginning at the point where the Cold Lead penetrates the floor, wall, or roof, plan the element run for each zone. Proper element spacing is based upon the results of the heat loss calculations or heat density requirements that were performed to size the heating system. Maintain a minimum of 2" distance between adjacent runs of ZMesh element, and do not allow ZMesh to cross itself.

B. Once the location of runs of ZMesh has been determined, connect one end of the ZMesh to one Transition Plate, by following the instructions in Section 7, “Making the Connection.”

If installation of ZMesh is on concrete use a flooring adhesive to hold the ZMesh in place. With a 3" wide putty knife place 3" wide swaths of adhesive perpendicular to the length of the ZMesh approximately every 18". Duct tape may be used to temporarily hold the ZMesh in place until adhesive dries. Follow directions of flooring adhesive manufacturer for application of floor adhesive. Once the adhesive is dry, remove and dispose of all duct tape.

If installation is over a wood sub-floor or sub roof, begin stapling the ZMesh to the sub-floor or sub-roof, pushing loose ZMesh ahead of you while pulling ZMesh tight and stapling it approximately every 18" on opposite sides and center. The first staple should be 12" away from the Transition Plate connector, to allow for making the connection between the Transition Plate connector and the ZMesh comfortably. “Bubbling up” of the ZMesh must be avoided. Staple folded areas around the outside edge of the fold.

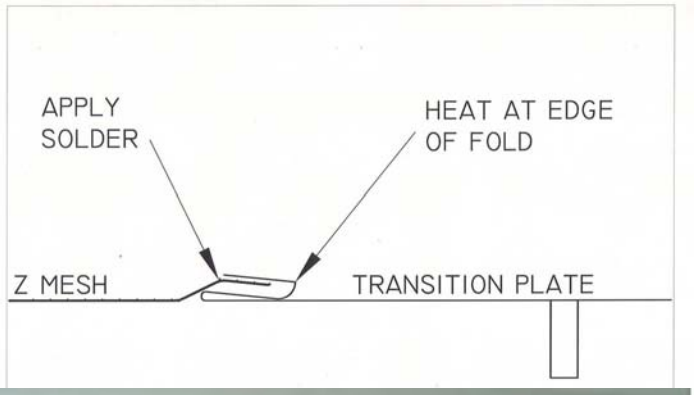
If installation of ZMesh is over a concrete slab that has elevated sleepers for hardwood flooring, the folds of the ZMesh element must occur over the concrete areas, not over the sleepers.

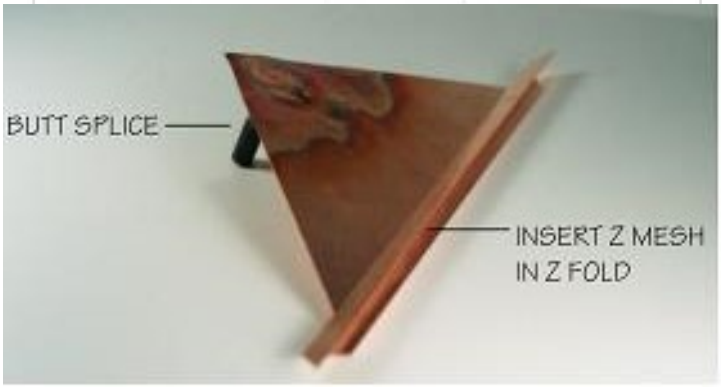
C. Begin to roll out the ZMesh starting at one of the Transition Plates. Fold the ZMesh element with two 90º folds to make parallel return runs and lesser degree turns to make non-parallel runs.

D. Once all of the required Z Mesh has been rolled out and the layout is finalized, crease each fold firmly (a scrap of 2" x 4" lumber can be used to create a crisp fold).

E. Connect the second end of the ZMesh to the second Transition Plate, by following the instructions in Section 7, "Making the Connection."

F. Once the ZMesh element has been installed, the covering (acceptable coverings and applications are noted in table at the beginning of this Design and Installation Manual section) must be installed immediately to prevent damage to the element and to prevent shorting of adjacent runs of element.



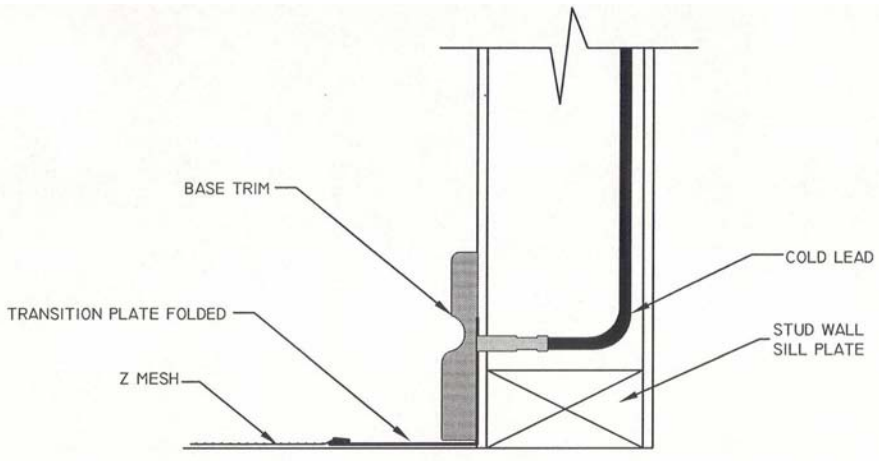


Note: The Heatizon Systems Solder (Heatizon Part Number NI129) is the only Solder to be used. Warning: Note precautionary measures for use of solder containing lead included in solder packet.

CAUTION: ZMesh element must never touch or cross any other ZMesh element or other metal or electrically conductive objects. Nails, staples or screws may penetrate the ZMesh element as long as they DO NOT contact any electrically conductive material or metal other than the ZMesh element. ZMesh element should never be installed over/under a mudbed with metal lath.

IMPORTANT! Record the number of feet of ZMesh Element that you have installed for each zone here:

IMPORTANT! One or more "STOP! DANGER!" paper warning signs indicating the presence of electric deicing, snow melting or warming equipment have been included with your Heatizon product packaging. These notices must be attached to approximately every 50 feet of the ZMesh Heating Element. Remove the notices prior to installing the floor covering etc.



Wall Section at Floor

IMPORTANT! A red plastic "STOP! DANGER!" sign indicating the presence of electric deicing, snow melting or warming equipment has been included with your Heatizon product packaging. This caution notice must be posted at the fuse or circuit breaker panel and be clearly visible.

3.3 ZMESH ELEMENT ON DECK INSTALLATION

ZMesh may be installed on wood or concrete decks in the same manner it is installed on wood subfloor and wood subroofs.

Note that elevated decks must always have either heated living space or insulation below the surface where the ZMesh heating element is installed.

ZMesh must always be protected from moisture by a waterproof membrane when used on exterior decks.

CAUTION: ZMesh element must never touch or cross any other ZMesh element or other metal or electrically conductive objects. Nails, staples or screws may penetrate the ZMesh element as long as they DO NOT contact any electrically conductive material or metal other than the ZMesh element. ZMesh element should never be installed over/under a mudbed with metal lath.

IMPORTANT! A red plastic "STOP! DANGER!" sign indicating the presence of electric deicing, snow melting or warming equipment has been included with your Heatizon product packaging. This caution notice must be posted at the fuse or circuit breaker panel and be clearly visible.

IMPORTANT! One or more "STOP! DANGER!" paper warning signs indicating the presence of electric deicing, snow melting or warming equipment have been included with your Heatizon product packaging. These notices must be attached to approximately every 50 feet of the ZMesh Heating Element. Remove the notices prior to installing the floor covering etc.

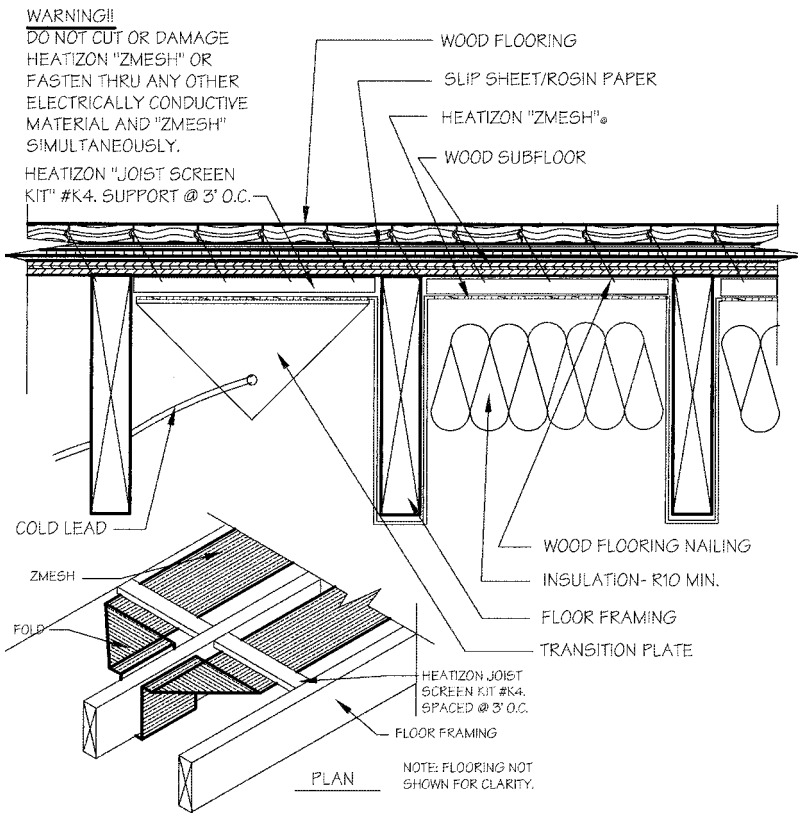
CAUTION: Risk of fire will occur if ZMesh is shorted to anything metal or electrically conductive. In order to reduce the risk, always use an Element Alarm (Part Number NI113) or amp meter with an alarm to check for continuity between the ZMesh and all metal or electrically conductive material.

IMPORTANT! Record the number of feet of ZMesh Element that you have installed for each zone here:

3.4 ZMESH RETROFIT/STAPLE-UP INSTALLATION

ZMesh element can be retrofit by stapling the ZMesh element beneath the sub-floor in the joist space by using a Heatizon Systems Joist Screen Kit (JSTSCRKIT). The ZMesh element is then stapled to the Joist Screen Kit spacers, which maintains approximately 3/4-inch space between the sub-floor and the ZMesh. Insulation is then installed below the ZMesh heating element leaving a minimum of 2-inches of dead air space.

Review the directions for ZMesh Interior Installation and use similar procedures.



IMPORTANT! Record the number of feet of ZMesh Element that you have installed for each zone here:

3.5 ZMESH ELEMENT ROOF DEICING INSTALLATION

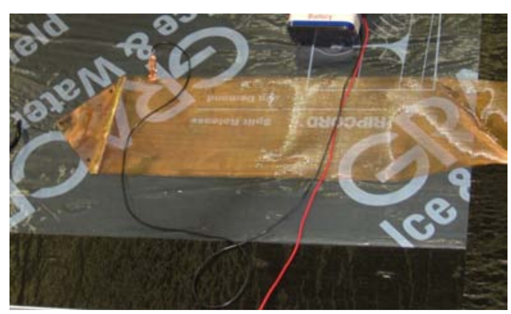
ZMesh Heating Element can be used for de-icing in valleys and on eaves as well as other trouble areas on roofs. The ZMesh must be covered with a self adhesive high temperature rated waterproofing membrane or membrane roof material. These products may also be used under the ZMesh element if desired. Always conduct a continuity check between ZMesh and any and all metal and ground before covering. Great care must be taken to make sure that the element is shielded from moisture. Always install Drip Edge Protector (Heatizon Part # NI144) prior to installing the ZMesh on top of the drip edge. Always install ZMesh with 2” spacing between the runs.

Fasteners (screws, nails, etc.) must never penetrate simultaneously through the ZMesh element and any metal. Valley metal, metal drip edge, metal flashings or other electrically conductive or metal roofing material or their attachments must never be allowed to come into contact with ZMesh. Unlike Tuff Cable in a Heatsink Kit or Invizimelt, ZMesh should not be used under metal roofs, valley metal, metal drip edge, or metal flashing etc.

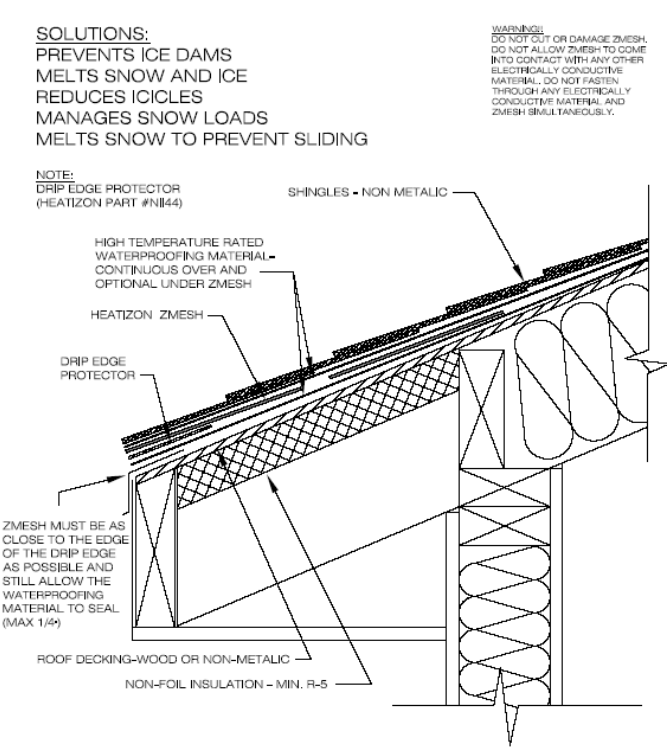
Review the directions for ZMesh Interior Installation and use similar procedures. Begin stapling the ZMesh to the sub-roof, pushing loose ZMesh ahead of you while pulling ZMesh tight and stapling it approximately every 18" on opposite sides and center. The first staple should be 12" away from the Transition Plate connector. “Bubbling up” of the ZMesh must be avoided. Staple folded areas around the outside edge of the fold.

IMPORTANT! Always repair cut or damaged ZMesh, and conduct a continuity check between ZMesh and any and all metal and ground before covering with Ice and Water Shield or EPDM.

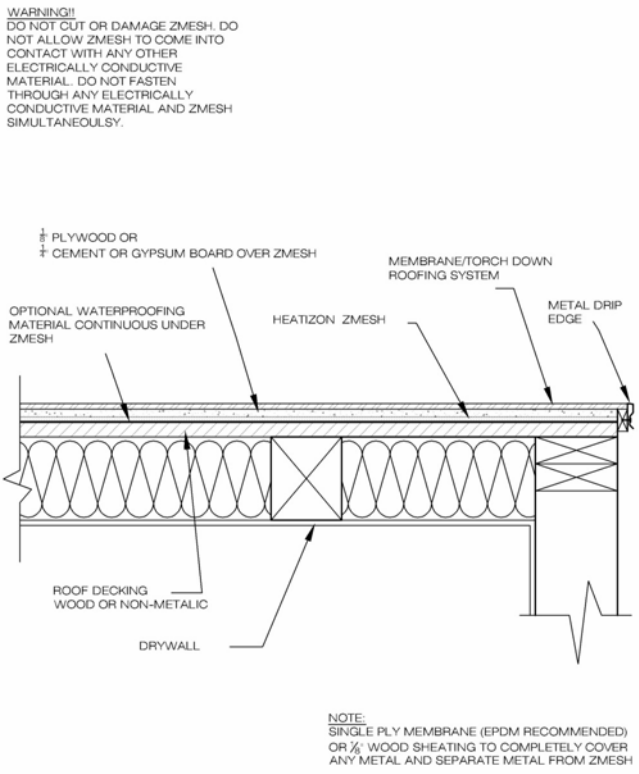
IMPORTANT! In order to reduce icicle size and number, ZMesh must be installed as close to the exposed edge of the drip edge as possible yet still allow the waterproofing material to seal (max 1/4”)



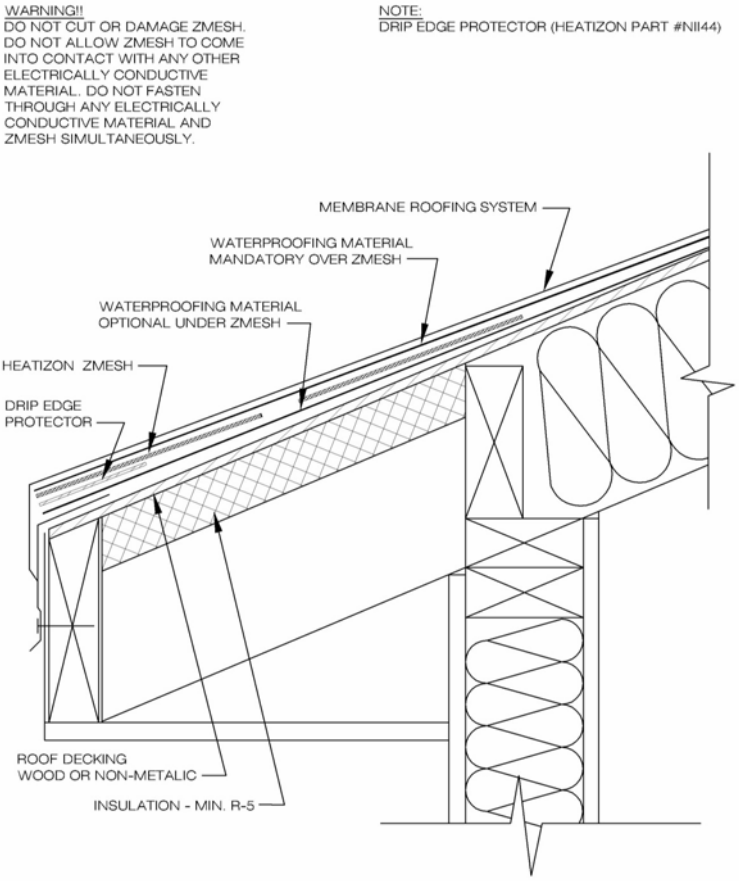
IMPORTANT! Using any drip edge other than a “normal” L-shaped drip edge or extending shingles beyond the drip edge will cause icicles to form.



Eave Detail — ZMesh Under Asphalt Shingles



ZMesh Under Single Ply Membrane



Eave Detail — ZMesh Under Single Ply Membrane

IMPORTANT! A red plastic "STOP! DANGER!" sign indicating the presence of electric deicing, snow melting or warming equipment has been included with your Heatizon product packaging. This caution notice must be posted at the fuse or circuit breaker panel and be clearly visible.

IMPORTANT! One or more "STOP! DANGER!" paper warning signs indicating the presence of electric deicing, snow melting or warming equipment have been included with your Heatizon product packaging. These notices must be attached to approximately every 50 feet of the ZMesh Heating Element. Remove the notices prior to installing the roof covering material etc.

CAUTION: Risk of fire will occur if ZMesh is cut and not repaired, or shorted to anything metal or electrically conductive. In order to reduce the risk, always use a Roof Alarm (Part Number NI126) or amp meter with an alarm to check for continuity between the ZMesh and all metal or electrically conductive material, and never cut anything in areas where ZMesh is located. Read Customer Information regarding additional information and warnings for Heatizon Roof Deicing Systems. See Roof Warning Information Sheet in this Design and Installation Manual.

Note: Always conduct a Heating Element Test and complete the form "Heatizon Systems After Installation Element Test" immediately following the installation of the ZMesh. See Section 10, "Heatizon Systems After Installation Element Test."

IMPORTANT! Record the number of feet of ZMesh Element that you have installed for each zone here:

HEATIZON SYSTEMS

ROOF INFORMATION

FOR ROOFING CONTRACTOR AND OTHER TRADES

The roofing contractor is responsible for insuring the Heating Element is not damaged during the installation of roofing materials.

Please communicate this information directly to anyone who will come into contact with the Heatizon Systems ZMesh or Tuff Cable heating element after it has been installed. Prior to beginning the installation of any Heatizon Systems product, read the applicable sections of the installation manual in their entirety. In order for Heatizon Systems installation instructions to be followed completely, **Heatizon Systems requires that a copy of this page be given to the General Contractor and the Roofing Contractor**, and additional copies be stapled on top of the ZMesh and near the Tuff Cable immediately after its installation. The copies and staples should be removed prior to installing the roof covering.

A Heatizon roof deicing system has been installed on this project. Here are the steps you need to take to insure that the system is installed correctly and is not damaged:

Waterproof underlayment. A high-temperature rate self-adhesive waterproof underlayment must be placed over Heatizon ZMesh and/or Heatizon Tuff Cable Heating Element in a Heatizon Heatsink Kit or in an Invizmelt Kit. If underlayment has not yet been installed over the Heatizon ZMesh and/or Heatizon Tuff Cable Heating Element, do not apply roofing material directly on top of the Heating Element. For membrane roofs, contact Heatizon Systems.

Electrically Conductive Materials. Heatizon ZMesh and Tuff Cable Heating Elements must not be cut or damaged, or allowed to come in direct contact with any other electrically conductive materials on the roof structure or elsewhere. The roofing contractor is responsible for insuring the element is not cut, or damaged in any way and does not come into contact with any conductive material. If the Tuff Cable Heating Element is penetrated during installation of roofing materials, the damaged Tuff Cable must be immediately repaired with a Heatizon Tuff Cable Splice Kit (Part # CABSPLKIT).

- Drip edge, flashing or any other conductive material on the roof structure must not connect to or come in contact with ZMesh or Tuff Cable Heating Element.
- Screws, nails, attachments or any other connectors securing the shingles (conductive or otherwise), drip edge, flashing, valley metal, skylights, etc or any other conductive material must not penetrate, connect to, or come in contact with ZMesh or Tuff Cable Heating Element.
- Do not cut, fold, twist, or alter the installed ZMesh or Tuff Cable Heating Element.
- All metal used over, under, in and/or on the roof must be kept away from ZMesh, or must be completely electrically insulated from it.

Continuity Check. Immediately following installation, ZMesh or Tuff Cable Heating Element has been visually inspected for cuts and other damage, tested for continuity and correct readings have been recorded. The Roofing Contractor is responsible for any penetration, cutting or other damage done to the ZMesh or Tuff Cable Heating Element. Wherever conductive material is used under, over, in, or on the roof, ZMesh and Tuff Cable Heating Elements should have a continuous continuity check performed during the installation of all conductive roofing materials. A Roof Alarm is available for rental or purchase from Heatizon Systems to assist the roofing contractor in performing this continuity check. The circuit must always be open. See Roof Alarm instructions for more detail.

After the Installation. Immediately following installation, the ZMesh or Tuff Cable Heating Element is to be visually inspected and electronically tested for continuity and the correct readings recorded in the Design and Installation Manual. The Roofing Contractor is responsible for any penetration, cutting, or other damage done to the ZMesh or Tuff Cable Heating Element.

Electrical Codes. The Cold Leads of the Heatizon Roof Deicing System is considered part of a listed snow melt/deicing system. However, local electrical codes may require Cold Leads to be run in conduit between the Control Unit and the heated section. Consult with a local electrical inspector or other relevant authority prior to installation.

Warnings. Heed all warnings in the Heatizon Systems Design and Installation Manual, the product packaging, and attached to or affixed to the product.