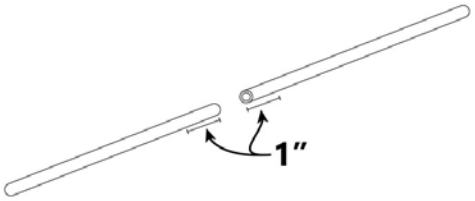
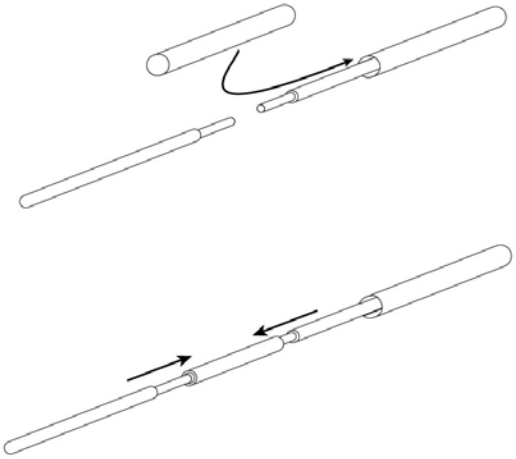
Cold Lead to Cold Lead

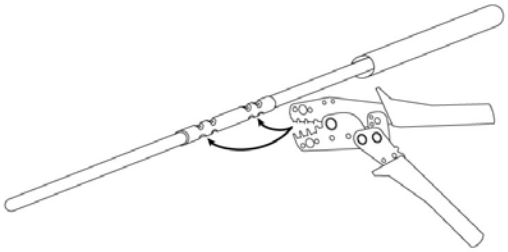
Step 1: Strip wires. The Cold Lead splice is made using a Heatizon E211 butt splice connector. This connection is accomplished by stripping back the insulation on both Cold lead wires to be spliced one inch.



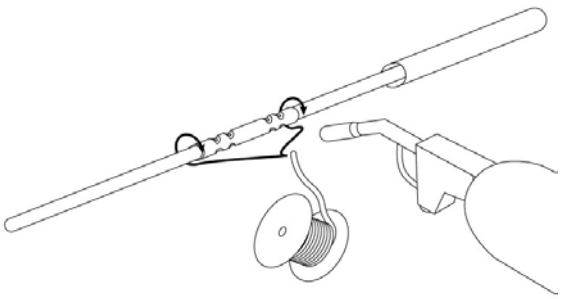
Step 2: Crimp connection. Slide the heat shrink tubing and sleeve over one Cold Lead to a point at least 8" beyond the splice. Insert the Cold Leads into the E211 butt splice connector. Crimp the connection in two locations on each side of the lug.

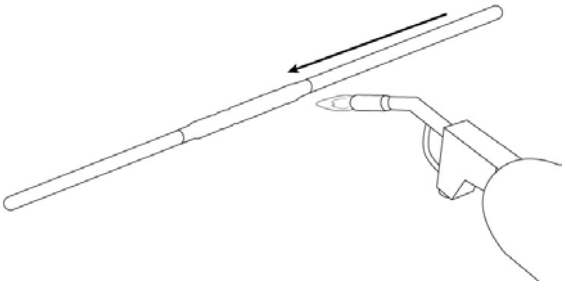


Step 3: Solder connection. Solder all exposed copper strands of Cold Lead with the solder provided. Make certain that heat is sufficient to draw solder completely into the splice. Never scorch the insulator on the Cold Lead.



Step 4: Heat shrink connection. When the splice has completely cooled slide the heat shrink and center it over the splice. Use a broad soft flame torch or hot air gun to heat around the diameter of the tube to warm and shrink it. Do not scorch the tube. The shrink is complete when adhesive oozes from between the tube and the Cold Lead.





Tuff Cable to Cold Lead using E210BS or E210BS90

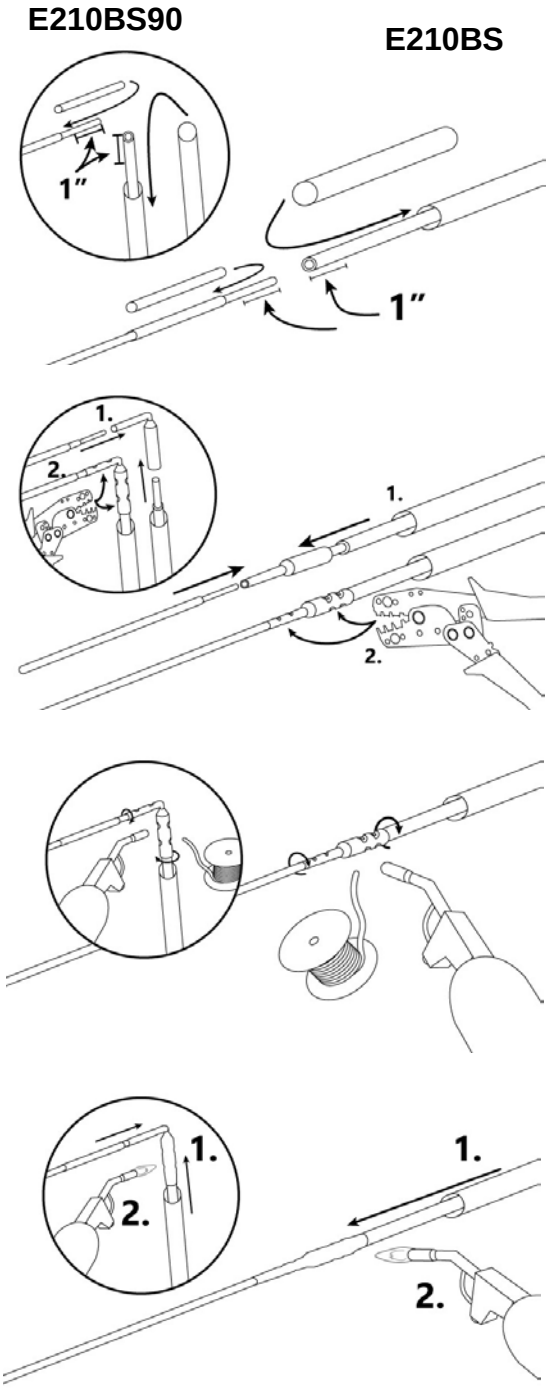
For each connection from Tuff Cable to Cold Lead, you have been provided the following items in your Tuff Cable Heating Element Kit: E210BS Butt Splice, plastic sleeve, heat shrink length, and solder. You will also need wire strippers, a crimping tool, and a broad soft flame torch or heat gun.

Step 1: Strip wires. The Tuff Cable element is connected to the Cold Lead with the Heatizon E210BS butt splice connector. This connection is accomplished by stripping back the insulation on the Tuff Cable and Cold Lead wires to be spliced seven eights of an inch.

Step 2: Crimp connection. Slide the heat shrink tubing and sleeve over the Tuff Cable to a point at least 8" beyond the splice. Insert the Tuff Cable and the Cold Lead into the E210BS butt splice connector. Crimp the connection in two locations on each side of the lug.

Step 3: Solder connection. Solder all exposed copper strands of Tuff Cable and Cold Lead with the solder provided. Make certain that heat is sufficient to draw solder completely into the splice. Never heat the small end of the E210BS butt splice or scorch the insulator on the Tuff Cable or Cold Lead. While connection is cooling carefully slide the sleeve over Tuff Cable end of the E210BS butt splice.

Step 4: Heat shrink connection. When the splice has completely cooled slide the heat shrink and center it over the splice. Use a broad soft flame torch or heat gun to evenly heat around the diameter of the tube to warm and shrink it. Do not scorch the tube. The shrink is complete when adhesive oozes from the tube ends.



Invizimelt — Tuff Cable to Cold Lead using E210BS90

Two (2) connections of Tuff Cable to Cold Lead found in the Invizimelt Origination Kit includes: 2—E210BS90 Butt Splice, 2—Small Heat Shrink, and 2—Large Heat Shrink. You will need wire strippers, a crimping tool, and a broad soft flame torch or heat gun.

Step 1: Cut Tuff Cable. Cut the Tuff Cable element 2" beyond the end of the last Invizimelt Panel.

Step 2: Strip wires. The Tuff Cable element will be connected to the Cold Lead with the "L Shaped" Heatizon E210BS90 butt splice connector. This connection is accomplished by stripping back 7/8" of the insulation on the Tuff Cable and Cold Lead wires to be spliced. Be sure to line up the cables with the insulator from the conductors.

Step 3: Insert Heat Shrink Tubes. Slide the small heat shrink tube onto the end of the Tuff Cable Element, and slide the large heat shrink tube onto the end of the Cold Lead. Take precaution to make certain the large heat shrink does not fall into the hole in the roof subsurface.

Step 4: Crimp Cold Lead and Tuff Cable connection. Insert the Cold Lead into the E210BS90 butt splice connector. Crimp the connection in two locations for integrity and continuity. Insert the Tuff Cable into the E210BS90 butt splice connector. Starting about 1/8" from the end, crimp the connection in two locations for integrity and continuity.

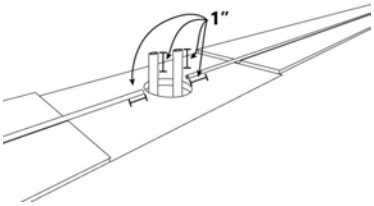
Step 5: Solder Tuff Cable connection. Solder all exposed copper strands of Cold Lead and Tuff Cable with the solder provided. Make certain that heat is sufficient to draw solder completely into the E210BS90 Butt Splice. Never heat the small end of the E210BS90 Butt Splice or scorch the insulator on the Tuff Cable or Cold Lead.

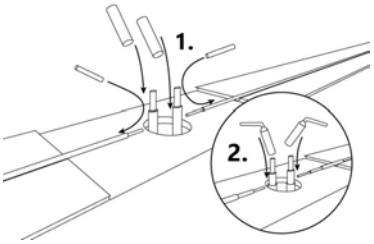
Step 6: Heat shrink connection. When the soldered connections have completely cooled, slide the small heat shrink tube over the Tuff Cable/E210BS90 splice so that the heat shrink tube extends as far over the 90 degree bend in the butt splice as possible. Slide the large heat shrink tube over the Cold Lead/E210BS90 splice so that the heat shrink extends as far over the small heat shrink tube covering the 90 degree bend in the butt splice as possible.

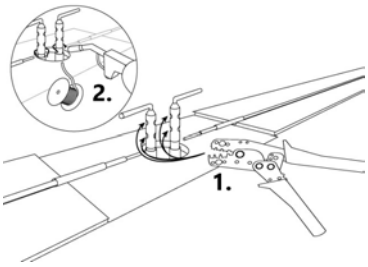
Use a broad soft flame torch or heat gun to evenly heat around the diameter of the heat shrink tube to warm and shrink it. Do not scorch the tube. The shrink is complete when adhesive oozes from tube ends.

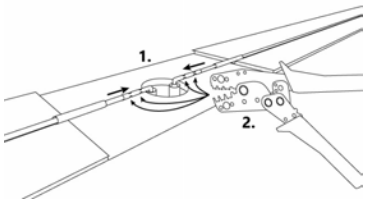
Follow origination plate installation instructions in "Tuff Cable in Invizimelt" section of the Design and Installation manual.

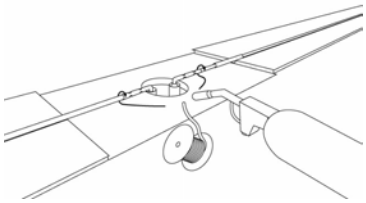
WARNING: Risk of Fire! Heat Shrink must completely cover the E210BS90 Butt Splice and all exposed Tuff Cable and Cold Lead in order to avoid shorts with Invizimelt.

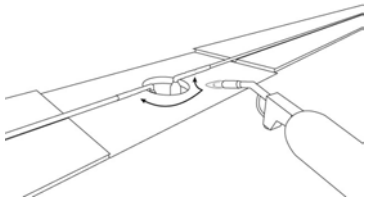


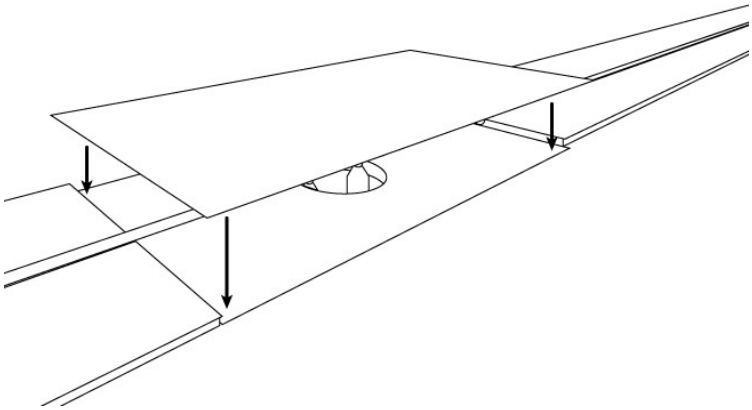






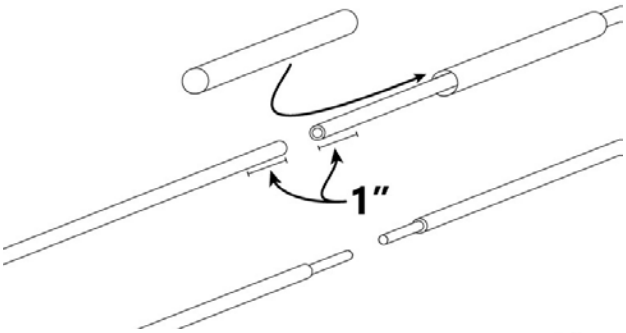




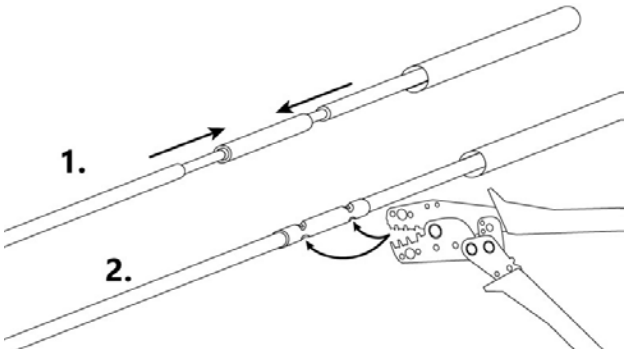


Tuff Cable to Tuff Cable Splice

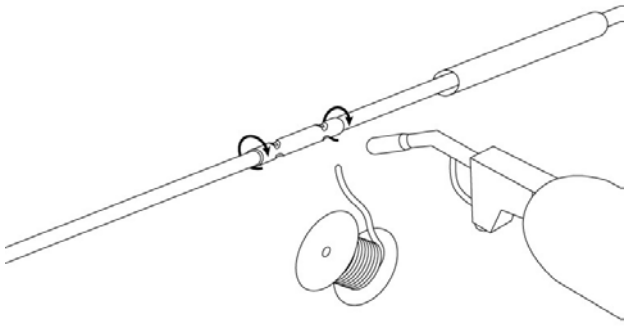
Step 1: Strip connection. Tuff Cable splicing is accomplished by sliding the provided heat shrink at least 8" beyond the splice and then stripping back one inch (1") of insulation on the end of both wires to be spliced.



Step 2: Crimp connection. Insert stripped wires from one end of the Tuff Cable into number 10 butt splice connector provided in splice kit and crimp the connection well. Repeat this procedure for the other end of the Tuff Cable.

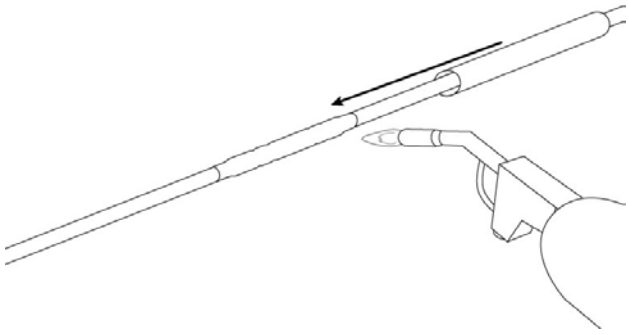


Step 3: Solder connection. Solder the splice with provided solder being careful not to burn the insulation on the wire.



Step 4: Heat shrink connection. When the splice cools slide and center the heat shrink over the butt splice. Warm the diameter of the heat shrink until adhesive oozes from between the Tuff Cable and the Heat shrink.

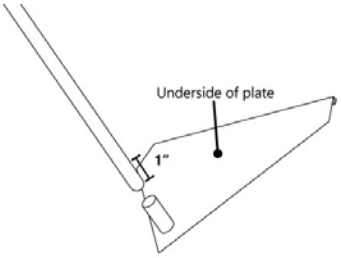
Step 5. Secure the repaired Tuff Cable in place.

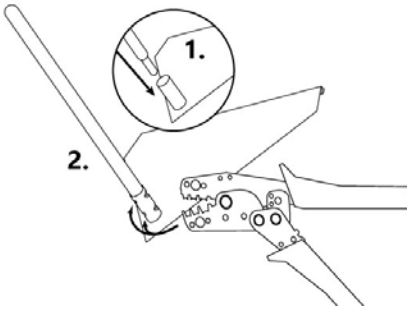


Always use a Tuff Cable Splice Kit whenever the Tuff Cable has been cut or damaged in any way. A Cable Repair Kit (CABREPKIT) should be used whenever repairing Tuff Cable in existing concrete or asphalt.

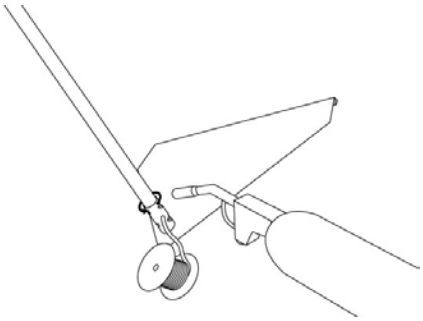
ZMesh to Cold Lead and Transition Plate

Step 1: Connect Cold Lead to Transition Plate. Connect the transition plate to Cold Lead by stripping back 1 inch of insulation from the Cold Lead. Insert the exposed Cold Lead into the butt splice connector on transition plate and crimp twice.

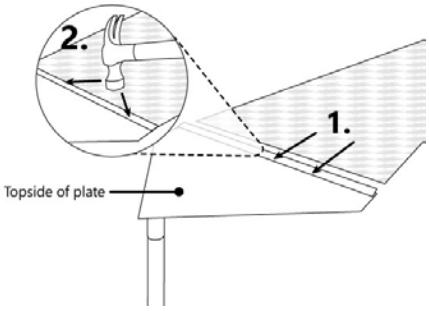




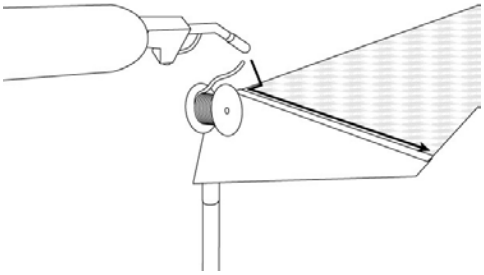
Step 2: Solder Cold Lead Connection. Solder all exposed copper strands of Cold Lead with provided solder, heating the butt splice sufficient to draw solder back into the splice.



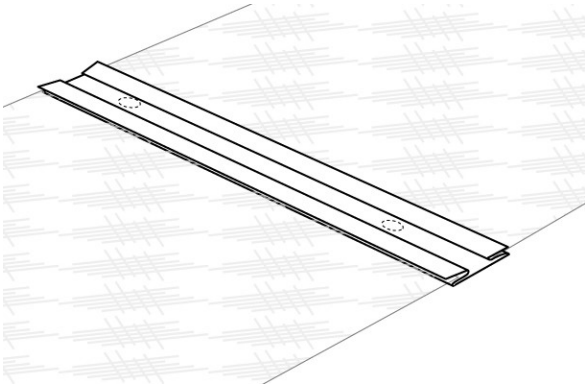
Step 3: Install ZMesh in Transition plate fold. If necessary cut the ZMesh so that it can extend the full depth of the fold on the transition plate. The ZMesh can easily be cut using scissors. Place the ZMesh in the fold of the plate and hammer down the fold as flat as possible using a length of 2 by 4 or a hammer. Caution should be used when hammering the fold to avoid hitting ZMesh on the tip of the transition plate.



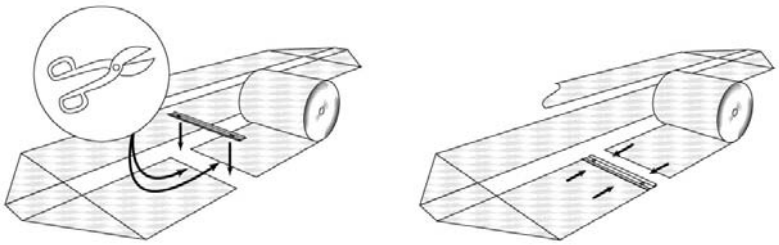
Step 4: Solder ZMesh connection. Apply heat to the Transition plate only and never to the ZMesh. Be extremely careful not to burn holes in the ZMesh. Apply the provided solder to the ZMesh. The solder will be drawn back into the fold and create a permanent bond between the Z Mesh and the Transition plate.



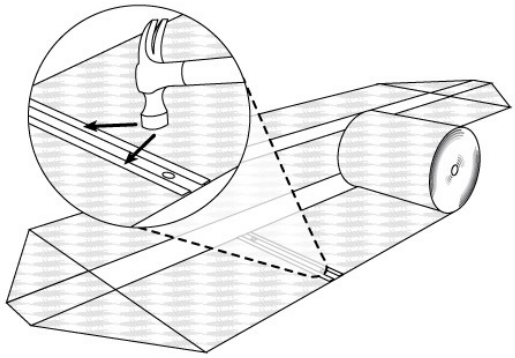
ZMesh to ZMesh with Z-Splice Plate



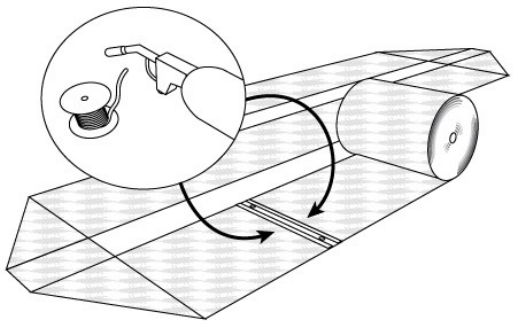
Step 1: Cut both runs of ZMesh to be spliced, leaving the cut straight and flat. Remove any loose strands. Insert first section of ZMesh into one side of the Z splice plate. Gently crimp or compress Z fold; ensure that ZMesh stays fully inserted in the fold. Repeat this procedure with second length of ZMesh.



Step 2: Flatten the connection by crimping or compressing the splice plate down on top of both pieces of ZMesh using a short length of 2x4 stud or by tapping gently with a hammer or rubber mallet.

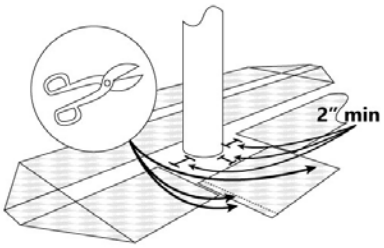


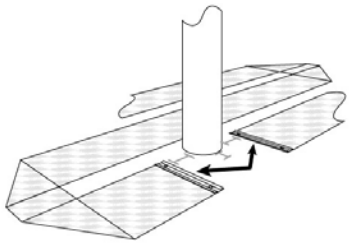
Step 3: Solder Splice connection. Apply heat to the splice plate using a propane torch. Place the tip of the solder ahead of the flame until solder flows into the fold. The entire length of the connection between Z Mesh element and Transition Plate must be soldered. Be careful not to scorch or burn holes in the Z Mesh or to ignite or damage the subsurface.



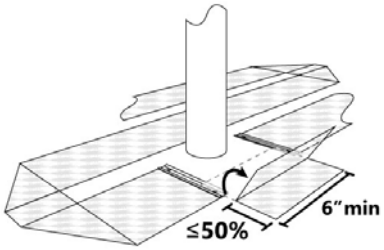
ZMesh to ZMesh to Avoid a Stationary Object Using Cut-Out Kit

Step 1: Mark both sides of the ZMesh to determine its location in reference to the stationary object. Mark a 2” perimeter around the stationary object. **Make sure the ZMesh will remain at least 2” away from any metal.** Use those measurements to determine how much of the run of ZMesh will need to be moved to avoid the object. The length of ZMesh to be spliced must be a minimum of 6”. The minimum width of the folded ZMesh **cannot** exceed 50% (or half of the width) of the ZMesh. If it exceeds 50% or half of the width of the ZMesh you will need to either move the run of ZMesh or find an alternate path around the stationary object. **The ZMesh can only be folded on itself once. You cannot fold it into thirds or fourths, etc.**

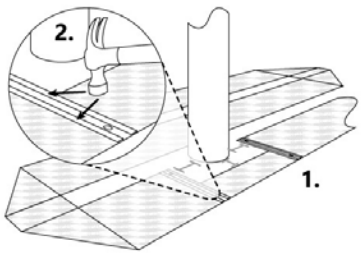




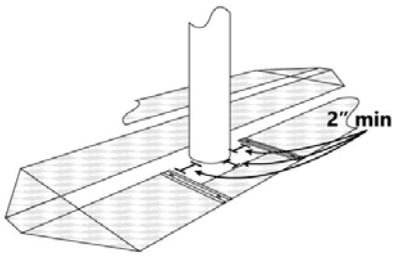
Step 2: Place the Z splice plates so the inside edges are no closer to the stationary object than the 2” perimeter marked in step one. Using the Z splice plates as a guide, make clean, straight cuts for the ZMesh to fit into the outside Z fold of the Z splice plate. Using a hammer or rubber mallet gently flatten or compress the Z fold making sure the ZMesh stays fully inserted into the Z fold. Repeat this process for the second Z splice plate on the other side of the stationary object.

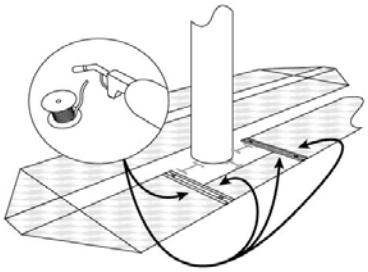


Step 3: Using the Z splice plate as a guide cut a piece of ZMesh that will fit between the two Z splice plates. Ensure that both clean straight edges will fit into the Z fold of both Z splice plates. Line up the edge farthest away from the stationary object with the edge of the Z splice plate. Fold the portion of ZMesh that needs to be moved away from the stationary object over so that the ZMesh is a minimum of 2” away. Insert both edges of the ZMesh into the Z fold. Using a hammer or a rubber mallet gently flatten or compress the Z fold making sure the ZMesh stays fully inserted into the fold.



Step 4: Solder the Z splice plate connections by applying gentle heat to the center of the Z splice plate using a propane torch. Place the tip of the solder ahead of the flame until the solder flows into the Z fold. The entire length of the connection between ZMesh and Z splice plate on both the inside and outside of the Z fold must be soldered. Repeat the process until all connections have been properly soldered. *Be careful not to scorch or burn holes in the ZMesh or to ignite or damage the subsurface. If the ZMesh is damaged by excessive heat it will need to be repaired.*





Step 5: After the Z splice plates have cooled, fasten the splice plate to the sub-deck with two screws to prevent any movement. **Do not** fasten the Z splice plate or ZMesh into any metal surfaces.