

**SUMITOMO RECOMMENDED PROCEDURE
SRP SP-F04-057****PROCEDURE FOR INSTALLATION OF EPOXY IN HORIZONTAL POSITION**

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1.0 General

1.1 This procedure describes the techniques required for performing remediation of a tube cable installation to prevent movement due to extreme vibration or extreme temperature variations on bridges. Bridges are unique in that movement, vibration must be considered and taken into consideration. In addition the structural support required to properly support the tube cable infrastructure including but not limited to tube cables, tube distribution units, tube cable supports is critically important to provide a system with long term reliability.

1.2 Although actual on-site placing techniques may vary depending on site conditions, generally, tube cables are installed using standard cable installation techniques and no special tools or equipment are required.

1.3 However, there are some very important points to be considered when planning for and accomplishing a tube cable installation in order to avoid damaging the tube cables before, during, and after they are installed.

1.4 The ultimate goal is to install tube cables correctly the first time. They should be installed along properly supported, relatively bend-free, smooth flowing routes so they will pass tube pressure and obstruction tests and provide trouble-free fiber bundle blowing performance.

2.0 Safety Precautions

2.1 The use of safety equipment (safety glasses, safety shoes, gloves) is recommended during this installation procedure.

3.0 Reference Documents

3.1 Sumitomo Recommended Procedure, *FutureFLEX Tube & Tube Cable Sealing Procedures*, SRP SP-F04-019.

3.2 Sumitomo Recommended Procedure, *Installation Procedures for Liquid-Tight Kellems® Grips*, SRP SP-F04-024.

3.3 Sumitomo Recommended Procedure, *FutureFLEX Tube Cabling Splicing Procedures*, SRP SP-F04-031.

3.4 Sumitomo Recommended Procedure, *FutureFLEX Armored Tube Cable Installation Procedures*, SRP SP-F04-039.

3.5 Sumitomo Recommended Procedure, *FutureFLEX Sealing Procedures for FutureFLEX Tube Cables*, SRP SP-F04-032

4.0 Equipment / Tools Required

4.1 Standard cable installation hardware, equipment, and tools. In addition you may need:

Plumbers putty, Dremel tool, drill with abrasive cutting wheel, Rescue tape, epoxy, cut proof gloves.

5.0 Armor Jacket is Accessible in TDU

If the end of the armor portion of the tube cable is accessible within the TDU (**See Figure #1**) follow these steps.

5.1 Take plumber's putty, Play-Doh or modeling clay and rolling it in your hand to make a long rope like section of the material. **See Figure #2.**

5.2 Wrap the plumber putty around the edge of the armor where it meets the jacket of the core tube cable, making sure to press the putty into and sealing the edge. Form a funnel like section at the highest point of the tube cable. **See Figure #3.**

5.3 Take the epoxy and inject it into the area in Figure #3. Allow the epoxy to flow down into the space between the armor and the jacket of the core tube cable.

5.4 Move the core tube cable up and down 1 time to allow the epoxy to fill in all around the cable. Inject the epoxy into the opening until it appears to be filled. Continue to repeat this at least 6-8 times.

5.5 Allow the epoxy to set and begin to cure before you move the tubes.

5.6 Follow this steps above to encapsulate the tubes by placing the plumber putty at the edge of the jacket of tube cable and the tubes and following above procedure.

5.7 Finished product should look like **Figure #4** **When cured please wrap Rescue Tape around the end following SP-F04-054.**

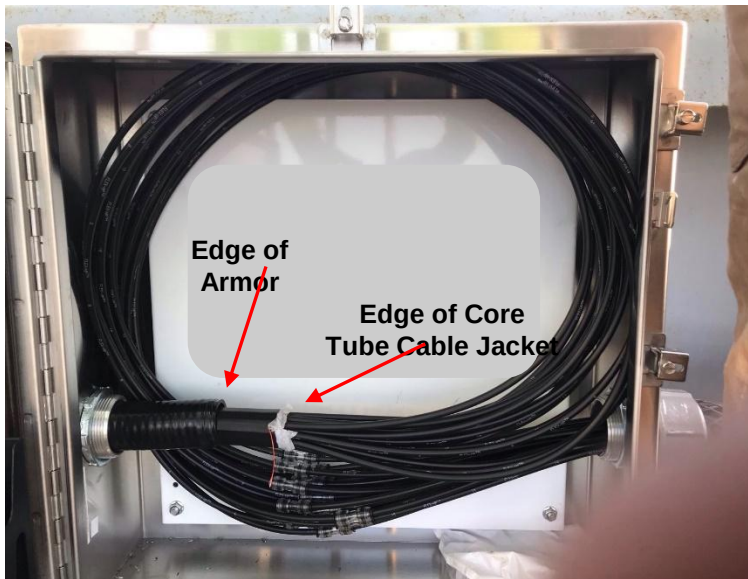


Figure 1



Figure 3

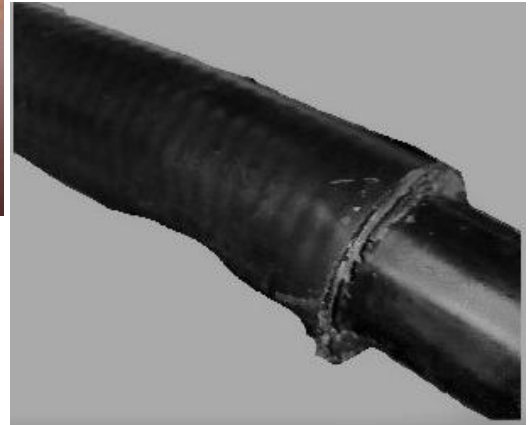


Figure 4

6.0 Armor Jacket NOT Accessible in TDU

If the end of the armor portion of the tube cable is NOT accessible within the TDU (See Figure #5) follow these steps.

6.1 In order to apply the epoxy to the tube cable in this circumstance installer will need to identify the low point as suggested in Figure #6

6.2 Installer should cut an opening in the outer jacket of the armoring with a Dremel tool with an abrasive blade. This opening should be 1" long by ½" wide as shown in Figure #7



Figure 5

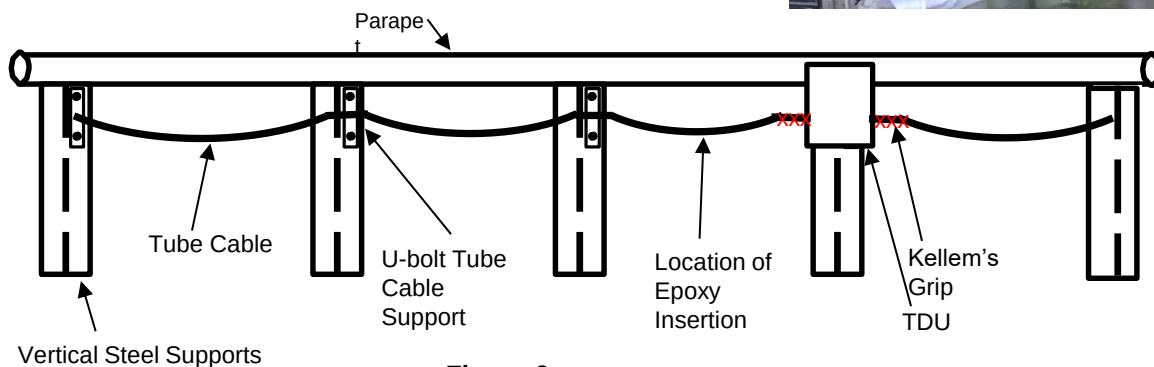


Figure 6



6.3 Installer should then, using the Dremel tool cut through the metal armoring and using pliers, remove the corrugated armor from the opening.

CAUTION: DO NOT CUT THROUGH THE ARMORING AND CUT THE CORE TUBE CABLE JACKET

6.4 Installer should then proceed to inject the epoxy into the opening making sure to use enough epoxy to flood the area as in the previous procedure section 5.2-5.3

6.5 Allow enough time between each application to allow the epoxy to flow to the bottom of the opening. This should take approximately $\frac{1}{2}$ of the epoxy in the tube.

6.6 Allow enough time for the epoxy to cure before sealing the opening with Rescue tape.