

RECOMMENDED Procedure

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SP-F01-009 Methods to Figure-8 & Coil Cables, Issue 2

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1. GENERAL

For cable installations requiring multi-section or bi-direction pulls, cable is typically placed on the ground in a Figure-8 configuration. This procedure is commonly known as "Figure-8ing". During figure-8ing, some twists can be imparted to the cable but are removed as the cable is installed. Twists can affect how smoothly the cable lays on the ground with small figure-8s but typically have no affect on large figure-8s. Under equal conditions, all cable types will experience the same amount of twist. But, the existence of twists is more apparent in some designs including those with groupings of rigid external strength elements which may bend more easily in one direction than the other. These include central tube cables, which are typically selected based on improved sheath entry, smaller size/weight, and higher fiber packing density compared to other designs. If necessary, twists can be eliminated during figure-8ing.

Coiling is the most common method of preparing cable slack length for storage or staging prior to splicing. Some coiling techniques can impart twists to the cable. These twists are not a problem for cable performance but in some cases can inhibit smooth handling and produce irregular coils. Twists are more apparent in cables with a preferred bending direction. A variety of methods are available for coiling any cable type without inducing twists.

This document describes preferred methods for figure-8ing and coiling cables.

2. SAFETY PRECAUTIONS

2.1 The use of safety equipment is strongly recommended during the installation and handling of optical fiber cable.

3. REFERENCE DOCUMENTS

3.1 Sumitomo Recommended Procedures:

SP-F01-001 *Cable Placing*

4. TOOLS REQUIRED

No specific tools or materials are required to complete this procedure.

5. METHODS TO FIGURE-8 CABLES

Cable twists during figure-8ing are not necessarily a problem because they are automatically removed (or reversed) as the cable is installed. Figure-8s should always be made as large as possible to simplify payoff (fewer layers to get tangled, limit height of stacking layers) as well as to minimize the affect of any twists. If figure-8s are small, twists can affect how smoothly the cable will lie on the ground.

The best method to limit the impact of twists is to make large figure-8s. However, twists can be reduced or eliminated by *rotating the cable in the opposite direction of the twist* as necessary while figure-8ing.

One method for eliminating twists during figure-8ing is described below.

5.1 Single Rotation Method

5.1.1 During this procedure, the cable will cycle between $-\frac{1}{4}$ rotation and $+\frac{1}{4}$ rotation such that NO twists (full rotation) are induced. Use the sheath marking as a guide to indicate cable rotation.

5.1.2 Place the first half-loop on the ground. The cable will have a $-\frac{1}{4}$ rotation at the tip of the loop and rotate back to \emptyset rotation at the cross over point.

5.1.3 Place the second half-loop on the ground to complete one full figure-8. The cable will have a $+\frac{1}{4}$ rotation at the tip of the loop and a $+\frac{1}{2}$ rotation at the cross over point.

5.1.4 Before starting the next figure-8 layer, **rotate the cable $-\frac{1}{2}$ rotation at the cross over point** such that the cable is back at \emptyset rotation (no twist).

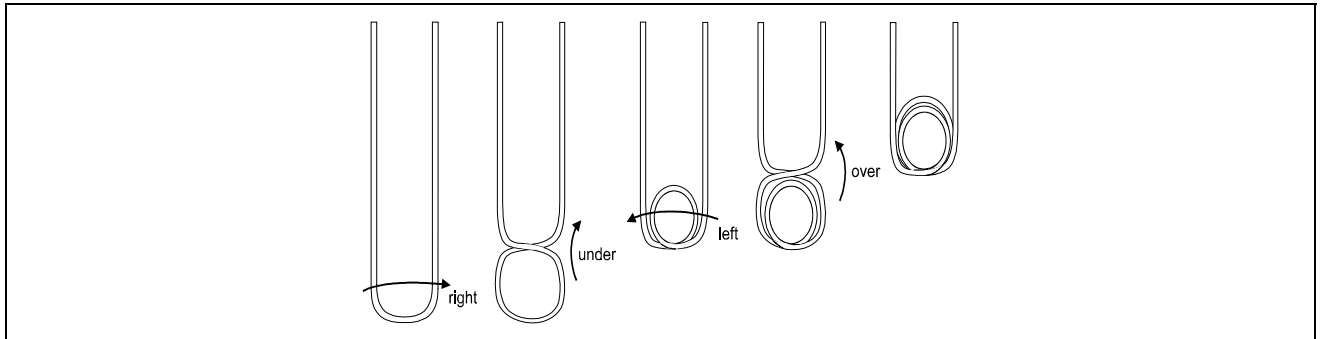
5.1.5 Repeat steps 5.1.2 to 5.1.4 to form additional figure-8 layers.

NOTE: As the cable is rotated back to \emptyset rotation in step 5.1.4, the first half loop for the next figure-8 layer is automatically formed.

6. METHODS TO COIL CABLES

As with figure-8ing, some cable twists in a coil are not necessarily a problem but can make coiling more difficult and produce irregular coils. For end coiling with no twists, simply create a loop at the cable end and then roll the cable into a coil. For midspan coiling, use one of the following procedures to prevent twists.

6.1 Horse-Shoe Method



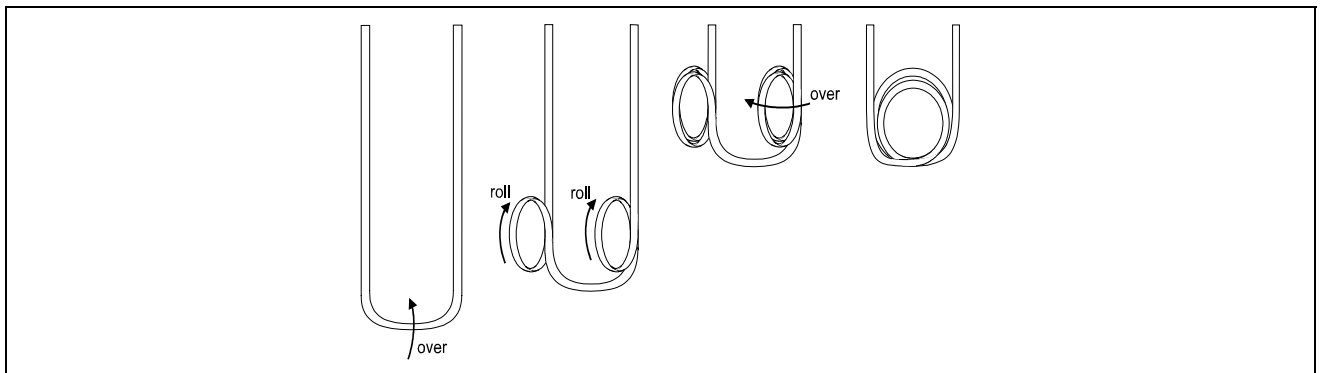
6.1.1 Place the entire length of cable to be coiled on the ground in the shape of a horseshoe.

6.1.2 Twist the cable $+1/2$ rotation at the end of the horseshoe to form a loop. Flip the loop *under*.

6.1.3 Twist the cable coil $-1/2$ rotation (or opposite direction from previous rotation) to form the next loop. This time flip the coil *over*.

6.1.4 Repeat steps 6.1.2 to 6.1.3 until the entire length of cable is coiled.

6.2 Rolling Horse-Shoe Method



6.2.1 This method is similar to the horseshoe method described above but typically requires two people.

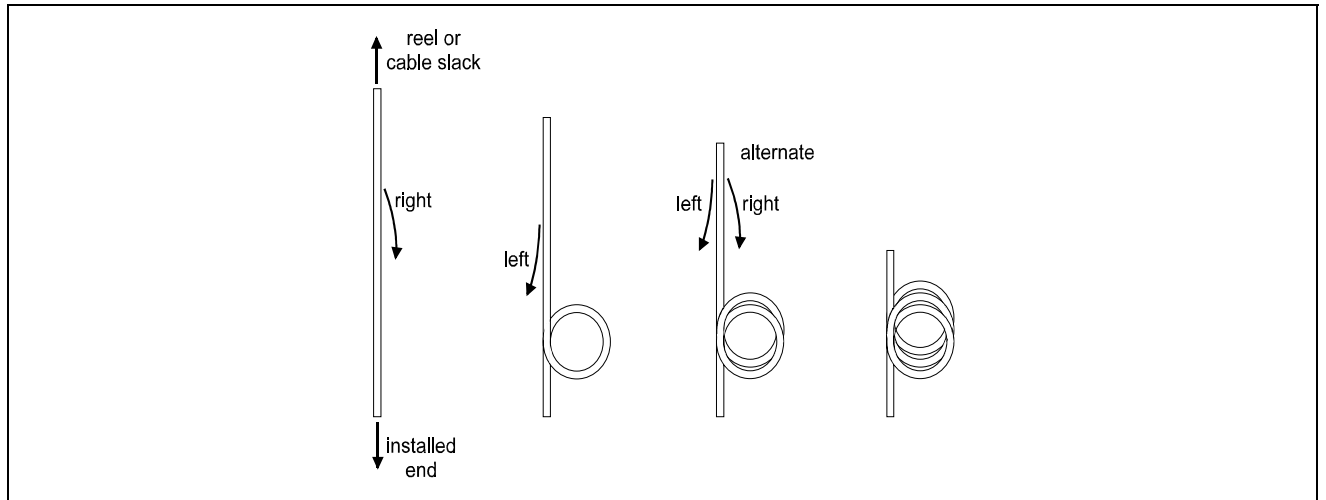
6.2.2 Place the entire length of cable to be coiled on the ground in the shape of a horseshoe.

6.2.3 Rotate the tip of the horseshoe over to create two loops in the cable at the end of the horseshoe, approximately 3-5 feet apart.

6.2.4 Roll both loops simultaneously to create two coils.

6.2.5 After the entire cable length has been coiled, rotate one of the coils back $1/2$ rotations and combine the two coils into one.

6.3 Alternate Side Method



6.3.1 Create one full loop for the coil. The cable will have a $+\frac{1}{2}$ rotation.

6.3.2 Create the next full loop and place it on the opposite side of the coil as the previous loop. The cable will now have a \emptyset rotation.

6.3.3 Continue to *alternate placing loops on one side of the coil and then the other* (repeating steps 6.3.1 to 6.3.2) until the desired cable length is coiled.

NOTE: A swivel must always be used on the cable pull-end to prevent generating twists in the cable during installation.