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Applications
Engineering Note

Handling Preferential Bend Cables

AEN 173, Revision 1

Preferential bend cables are designed with strength members on each side of the cable located 180 degrees apart. There can be one or two strength members on each side made of Glass Reinforced Plastic (GRP), round steel wire, or flat steel wire depending on the cable. In some cables the strength members are embedded in the jacket, while other designs do not embed them and are located below the jacket. All these cable constructions make cable handling different than cables that do not employ this design since the cable prefers to bend in one direction and not in the other direction that is in the opposite 90-degree plane.

Bending and twisting cables in the non-preferential axis can cause strength members to be pushed out of the jacket on one side and into the jacket on the other side. Both results can structurally damage the cable and break fibers.

When the preferential bend axis of the cable is not maintained during installation of this type of cable, it is also possible that macro bend induced losses are created when bends and twists are located together in the same area of cable. As with all cables, the minimum bend diameter must always be maintained.

The below SRPs should be used in addition to this AE Note for placing cable in ducts and lashed aerial applications. Also listed is AE Note 165 which includes a cable handling and placing checklist:

Cable Placing Checklist and Handling: Squirting, Tangling, and Storage – AEN165:
https://www.corning.com/catalog/coc/documents/application-engineering-notes/AEN165.pdf

Duct Installation of Fiber Optic Cable - SRP 004-011:
https://www.corning.com/catalog/coc/documents/standard-recommended-procedures/005-011.pdf

Lashed Aerial Installation of Fiber Optic Cable - SRP 004-010:
https://www.corning.com/catalog/coc/documents/standard-recommended-procedures/005-010.pdf

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Placing Preferential Bend Cables

Figure 1

Figure 2

Use print on the cable jacket (Figure 1) as a guide to minimize twists on the cable, keep the print straight. Avoid twists in bends, work the twists out of any bends. Always maintain minimum bend diameter and do not exceed maximum tension of the cable. Following these rules will avoid strength member protrusion or creation of macro bend induced loss. A figure 8 slack configuration does not add twists into the cable (Figure 2).

When paying cable off the reel follow the instructions in AE Note 165 to avoid tangling and squirting, which can cause strength member protrusion.

Mid Span Slack Storage in a Vault – Tear Drop

Typical length for slack storage is 75 feet.
Verify minimum bend diameter prior to starting, available on the cable specification sheet.
Verify that the vault is large enough to allow for a closure to be installed on the cable.

Method for tear drop:

- Straighten out desired slack.
- Separate any twists evenly between the two sides of cable.
- In the vault, turn one cable around to match it up with the other cable. Both cables should appear as if they're exiting the same duct.
- Marry the two cables together and begin routing around the vault, taping as you go.
- Stick close to the vault walls while maintaining the minimum bend diameter. Do not push the cable into the corners.
- Watch for any added twists during routing. The print statement can be used as a guide to notice any twists. Remove the added twists before continuing with routing.

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- A twist in the corner of the vault is the most severe situation the cable can see. Be sure to move any twists to the long sides of the vault to keep the cable as relaxed as possible.
- The end of the slack will have a teardrop shape. Tuck the teardrop under the other slack loops to complete storage. The teardrop will create a routing radius that can be no smaller than 18''. It may be necessary to adjust the lengths of the stored loops to get the teardrop to fit properly in the vault.
- Figure 3 shows an example of cable slack stored using Tear Drop.

Figure 3

Mid Span Slack Storage in a Vault – Coil (Flip and Twist)

Typical length for slack storage is 75 feet.
Verify minimum bend diameter prior to starting, available on the cable specification sheet.
Verify that the vault is large enough to allow for a closure to be installed on the cable.

This method is used when slack is made by the installer while standing outside of the vault. The method will not add any twists to the coil. It is important to maintain the minimum bend diameter for installed cable.

Please refer to SRP "Mid-Span Coiling procedure for SST-Ribbon™ Cable, SST-UltraRibbon™ Cable, SST-Ribbon™ Dry-Lock Cable, RocketRibbon® Cable and any preferential bend cable - 004-086" for detailed procedure: https://www.corning.com/catalog/coc/documents/standard-recommended-procedures/004-086.pdf

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Figure 4 shows an example of cable slack stored using Coil (Flip & Twist).

Figure 4

Mid Span Slack Storage in a Vault – Place Cable Around Perimeter of Vault

Typical length for slack storage is 75 feet.
Verify minimum bend diameter prior to starting, available on the cable specification sheet.
Verify that the vault is large enough to allow for a closure to be installed on the cable.

This method is used when slack storage is made by the installer by routing the cable around the perimeter of the vault. Avoid twists and bends in the same location, work out twists to long section of vault. All bends must maintain the minimum bend diameter for installed cable.

Figure 5 shows an example of cable slack stored Around Perimeter of Vault.

Figure 5

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