

## Using ADSS cable in distribution applications - Storage and cable drop management

Electric coops and municipalities often have unique challenges and opportunities when deploying fiber to the home services. Since they're deploying fiber as a first generation solution, not replacing copper or coax, they often don't have a strand available for lashing cables. This means that All-Dielectric, Self-Supporting (ADSS) cables is often a better choice, since it can substantially reduce make-ready costs, typically has lower installed cost and faster installation than lashed cables.

However, ADSS cables bring a couple of considerations regarding cable storage and lashing. Below are some rules of thumb regarding ADSS cable storage and over-lashing.

### Cable storage

There are many reasons to store spare cable. Most commonly, cable is stored to provide access to splice drops. Cable is also stored to enable faster restoration or to accommodate future pole relocations.

There are different ways to store cables:

- On the pole
- On "snowshoes" designed for ADSS along the span
- In a handhole/vault

Each of these methods are shown in OFS' installation manual, IP-014A, ADSS installation on distribution lines.

For the snowshoe method, the stored cable is attached to the trunk cable. A common question is the maximum length of cable that can be stored in this scenario.

The OFS rule of thumb for this question is a total of 150' of spare cable, comprised of two 37.5' segments on either side of the pole. The 150' length is generally deemed sufficient for most splicing situations. Please note that this scenario is not completely risk-free. In specific scenarios at the upper end of the operating window of the cable, the weight of the cable and associated ice and wind, could increase the strain on the fibers in the trunk ADSS cable. However, this scenario has been successfully used by customers for over 20 years, and OFS has heard zero complaints regarding reliability issues associated with the configuration. We are therefore comfortable highlighting the rule of thumb above to store spare cable within the span with ADSS cable.

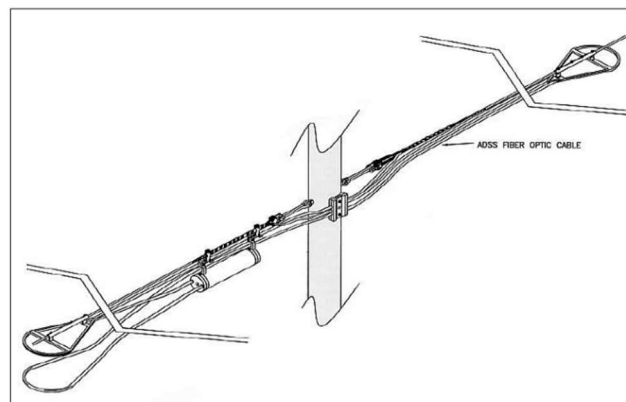


Figure 1: Cable storage with ADSS using snowshoes from Installation Practice IP-14A.

## Drop management

Another common question with ADSS cable is how to manage drops. In general, OFS' recommendation is for each drop cable to be self-supporting instead of being attached to the main ADSS cable. However, where there are aesthetic and/or make-ready concerns, a Mini-LT flat drop may be tie-wrapped to the main ADSS cable at undefined intervals. Such tie wrapping of drops to the ADSS cable is not completely risk-free. In specific scenarios at the upper end of the operating window of the cable, the weight of the cable and associated ice and wind, could increase the strain on the fibers in the trunk ADSS cable. Another rule of thumb can be used to help assess this risk.

The National Electric Safety Code (NESC) outlines cable loading recommendations in Section 251.B.

For these recommendations, the resultant of the ice and wind components are added together along with an additional constant, which is sometimes defined as the "K" constant and has historically been referred to as a safety factor. These constants are: Light – 0.05 lb/ft, Medium – 0.20 lb/ft, Heavy – 0.30 lb/ft. The weight of each drop cable is 0.021 lbs/ft.

So, a rough rule of thumb is that adding an individual typical flat drop cable, such as Mini LT, will decrease the safety factor used to calculate the maximum storm-load tension of the cable. Larger or heavier drops will decrease the safety factor more. For a main cable that is expected to operate at or near Maximum Rated Cable Load over its lifetime, this could be a reliability factor, depending on how closely real-life ice and wind match design assumptions. However, for those cables that are installed on spans shorter than the design maximum, there may be no reliability impact at all, since those cables operate with significant tensile margin.

Another factor in the feasibility of attaching drops to a main trunk cable is the lifetime of UV-stabilized cable ties. Although they may last for some period of time, they may need occasional maintenance.

Mid-span drops attachments are available to attach a flat drop deadend to an ADSS mid-span in a "flying tap" configuration. However, OFS does not recommend the use of these. The main reason is the drop cables add additional forces in both the horizontal and vertical directions depending upon the length of the drop, and it is hard to predict the impact of the additional forces associated with these drops on the main ADSS cable line.



PLP mid-span drop attachment

### Disclaimers

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