CAB© Solar Cable Management Installation Guide

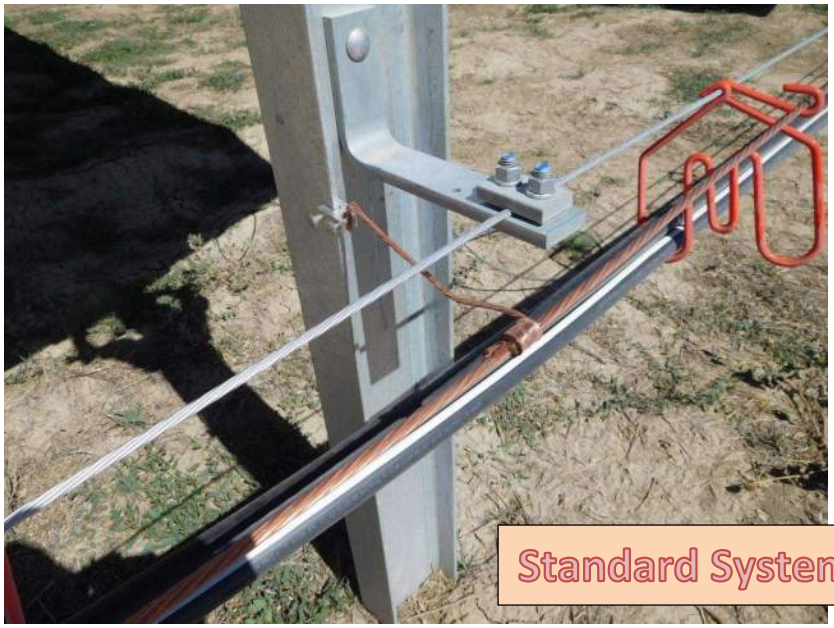
Revised 01-28-2022

1. **End-pier Kit – various part numbers**
   1.1. End-pier kits can be installed at any time during installation; however, the 2' long spiral dead end guy grips in the kit must be kept clean and free from dust and dirt until installed on messenger wire.
   1.2. Dead-end guy grips are installed by intertwining both sides of the grip around the messenger wire. If unfamiliar with proper method, refer to YouTube video available at https://www.youtube.com/watch?v=lpKcYEQ6Yb4 . This is a single-use only device.

Dead-end guy grip **End-pier Kit (and example installation)**

   1.3. The 2 colored spots on each side of the dead-end must align prior to wrapping the dead-end around messenger wire.
   1.4. The final twist at the end of the guy grip may require channel locks to make the grip tight and flush around the messenger wire.
   1.5. Bolt size is [redacted] which requires a [redacted] mounting hole. Nut is square and uses a [redacted] size deep socket.
   1.6. The end-pier kit can be used to set tension/sag of messenger wire between end-pier and first mid-pier based on chart in **CAB Products Messenger Wire Evaluation Rev 5 02-19-2021.**
   1.7. There are [redacted] nuts provided to prevent loosening of fasteners. The use of both nuts is optional based on specific installation requirements. Torque to [redacted] after tension/sag of messenger wire is determined.
   1.8. End-pier kit BOM available from CAB.
   1.9. *Note: Larger lock size hangers will be needed if installed within 2' of ends due to increase in O.D. caused by dead end guy wrapping around messenger wire.
   1.10. Integrated grounding note: if bonding to end-pier or ground rod at end is necessary, either a jumper from the messenger wire or extending the messenger wire to the grounding point will be needed. The end-pier is not rated for grounding.

2. **Mid-pier Kit – various part numbers**



2.1. The mid-pier kit installs flush against pier with long leg of mid-pier kit L-bracket extending out from pier with **messenger wire retainer clamp ON TOP OF BRACKET.**

2.2. Remove flat washer, lock washer & nut and reassemble in same order on opposite side of pier or bracket. Orient the bracket to be level with the ground.

2.2.1. **Important:** On level terrain use level on bracket in the same direction as the messenger wire run to keep bracket level with ground when tightening in final position. On uneven terrain, adjust level of the bracket to match the ground incline/decline. The hole under the top mounting hole is to be used if a customer supplied

additional bolt or screw is required to hold bracket in place. After leveling, torque mounting bolt/nut on pier to [redacted]

2.3. Installation of <u>standard</u> mid-pier kits using messenger wire retainer clamp– various part numbers

2.3.1. Place messenger wire in retainer clamp and set tension/sag using **CAB Products Messenger Wire Evaluation Rev 5 02-19-2021** as a guide.

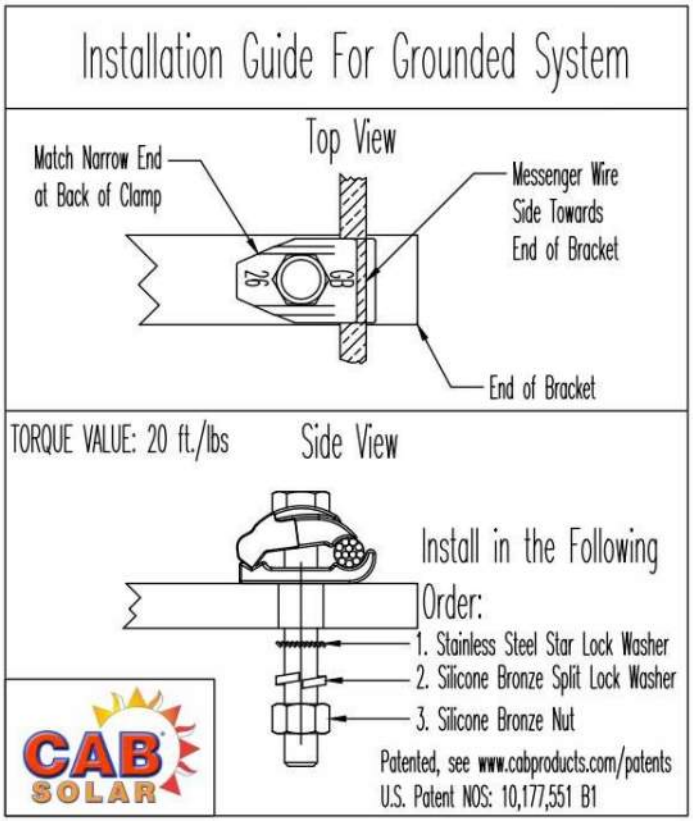
2.3.2. Messenger wire retainer clamp bolt must be tightened after the messenger wire is placed into the retainer clamp. Torque value for retainer clamp bolt is [redacted]

2.3.3. Loosening of the clamp may be done to allow for adjustment of the messenger wire. Reinstall as listed above.

2.4. Installation of <u>Integrated Grounding</u> mid-pier kits using Grounding Clamp – various part numbers.

2.4.1. The Integrated Grounding mid-pier kit will be identified by a label affixed to the L-bracket of the mid-pier kit. This component is part of the UL 2703 Safety Listing for grounding and bonding only.

2.4.2. Orient it as shown:



2.4.3. The Integrated Grounding mid-pier kit utilizes a grounding clamp as shown in diagram above. This component is part of the UL 2703 Safety Listing for grounding and bonding only.

2.4.4. The Integrated Grounding mid-pier kit must be installed on piers/posts with a rated coating designation of [redacted] or higher.

2.4.5. The Integrated Grounding mid-pier kit must be installed on piers/posts with a rated coating designation of [redacted] or higher if the post/pier is driven into the ground.

2.4.6. The Integrated Grounding mid-pier kit will have a [redacted] UL 969 compliant label with information on the safety listing on the underside of the mid-pier kit L-bracket. This label must remain on the mid-pier kit.

2.4.7. Set tension/sag as shown in **CAB Products Messenger Wire Evaluation Rev 5 02-19-2021** and tighten nut to [redacted]. using a [redacted] deep socket.

2.4.8. Loosening of the clamp may be done to allow for adjustment of the messenger wire. Reinstall as listed above.

2.5. Notes on mid-pier kit hardware.

2.5.1. Mounting bolt size is [redacted] and requires a [redacted] mounting hole.

2.5.2. Torque for messenger cable clamp nut is [redacted] torque for the nut mounting to pier is [redacted].; torque for grounding clamp nut is [redacted].

2.5.3. All bolts for mounting mid-pier kits to pier are [redacted] carriage bolts so one [redacted] socket will be required for tightening. For mounting to the pier, an extension or deep socket may be required to accommodate the depth of flange.

2.5.4. Use of the washer in the hardware attaching the mid-pier kit to the pier is optional. In installations where the washer will not fit, make certain the installation hole is the correct size for the bolt. The shape and size of washers may vary depending upon availability and project requirements.

2.6. See attached **CAB Products Messenger Wire Evaluation Rev 5 02-19-2021** for details on loads.

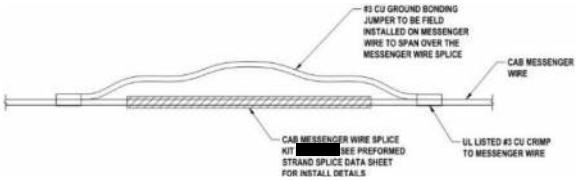
3. Messenger Wire

3.1. Messenger wire will limit accessibility of rows. Take this into consideration when scheduling installation.

3.1.1. For standard CAB System: Extra High Strength (EHS) [redacted] class A galvanized messenger wire is recommended for most applications. Confirm with EOR that this will accommodate all anticipated loads and class A galvanization is adequate for anticipated corrosion level.

3.1.2. For integrated grounding CAB System: COPPERWELD® COPPER - COPPER CLAD STEEL COMPOSITE Messenger Wire is available from CAB in several options. Only approved #2 or #3 equivalent grounding messenger wire can be used with CAB System.

3.1.2.1. If sections of the Integrated Grounding Messenger wire are spliced together, a jumper must be used to maintain the grounding continuity as the splices are not rated for this purpose and are not contained in the safety listing. See example below; this is a single-use only device:



3.2. All mid-pier kits should be installed prior to messenger wire installation.

3.3. The first step to install the messenger wire is to attach one end to end pier using end-pier kit (two end-pier kits per span of messenger wire). Tightening of the bolt/nuts in the end-pier kits will allow for some adjustment of tension/sag between the end pier and first adjacent mid pier.

3.4. Install messenger wire to closest mid pier. **IMPORTANT:** Use the attached **CAB Products Messenger Wire Evaluation Rev 5 02-19-2021** for details on amount of sag/tension to build in for particular site conditions. The proper amount of sag must be present between each of the piers.

3.5. Some sag of the messenger wire between piers is required. The amount will be dependent upon ambient temperatures and length between piers. Warmer installation temperatures will have the messenger wire at its "loosest"; colder installation temperatures will have the messenger wire at its "tightest". See attached **CAB Products Messenger Wire Evaluation Rev 5 02-19-2021** for details to assist in determination of what value will best suit your specific installation.

3.6. Repeat above process of installing messenger wire into mid-pier kits until the other end pier is reached.

3.7. There may be a slight change in the angle of the messenger wire from the end pier attachment point to the first mid-pier kit. This will not adversely affect the messenger wire or the CAB system. The clamp on the mid-pier kit for the messenger wire [redacted].

3.8. **IMPORTANT**: See attached **CAB Products Messenger Wire Evaluation Rev 5 02-19-2021** for details on amount of sag, tension, and loads.

4. **CAB Hangers-various part numbers**
   4.1. CAB Hangers should be installed just prior to cabling installation. Installation prior to this is not recommended.
   4.2. Place the CAB Hangers at intervals as specified by EOR on the messenger wire using the top installation loop.
   4.3. If installing hangers [redacted] of end-pier kit using dead-end guy grip, the hanger will have a larger lock size and will have a unique part #.
   4.4. Lay out all cabling to be hung in hangers along entire run. System is not designed to have cabling pulled through hangers.
   4.5. Place cabling in hangers.
      4.5.1. If multi-carrier hanger, place the cabling in the carrier furthest away from the installer, i.e. the "back one", and continue to place cables in closer carriers last.
      4.5.2. Hangers can be unattached and then reattached, e.g. opened and closed, to accommodate adding cabling at a later time.
      4.5.3. If utilizing the upper comm/data carrier, install that cabling last as it may interfere with hanger installation if installed prior to final closure.
      4.5.4. Place cabling equally in similar carriers, e.g. 2 in each carrier, 4 in each carrier.
      4.5.5. See hanger installation videos at the bottom of: https://www.cabproducts.com/solar/
   4.6. Which side of hanger is installed first is dependent upon type of hanger.
      4.6.1. If installing hanger with a long upper **comm/data open loop** (**Figure 1**) type carrier, install that side first. The small opposite loop is installed after cables are loaded. Note: usage of comm/data loop dictates whether it will be facing in or out with respect to the pier.
      4.6.2. If installing hanger with upper **comm/data closed loop** (**Figure 2**) with a curled locking arm on the other side of the hanger, install the locking arm first. Once all cabling is placed in lower carrier(s), the other hanger arm can be secured to messenger wire. Comm/data cabling to be installed in upper data loop at this step.
      4.6.3. Removal and reinstallation of hangers is accomplished by removing locking arm, placing cabling into carrier(s), and reinstalling the locking arm.

Figure 1

Figure 2

IMPORTANT NOTES

1. Any loose components or fasteners shall be re-tightened in accordance with these instructions.
2. Any components showing signs of damage that compromise safety shall be replaced immediately.
3. This document provides general information and guidance on the mechanical installation of the CAB Solar Cable Management Systems. Any specific questions of applicability of code(s), structural loading, electrical questions, or other technical areas must be resolved by EOR or AHJ.
4. Racking manufacturers must always be consulted for instructions/guidelines specific to their product.

Tool List

1. Messenger wire cutting implement (heavy duty, quality cutter is recommended for large volumes).
2. [redacted] deep socket for end-pier hardware.
3. Channel Locks for dead end guy grip.
4. [redacted] deep socket for mid-pier kit attachment hardware.
5. [redacted] deep socket for integrated grounding mid-pier kit grounding clamp.
6. Level (short magnetic type if possible) for installation of mid-pier kits to piers.
7. Long tape measure, or alternatively a spacer bar, and wide tip marker to mark spacing of hangers on messenger and to measure sag.
8. String or laser level for setting sag between piers.
9. Torque wrench.

Quick Reference

- Torque value for mid-pier kit mounting nut at the pier: [redacted]
- Torque value for mid-pier kit mounting plate, cable clamp nuts, & grounding clamp nut: [redacted]
- Torque value for end-pier kit bolts: [redacted]
- End-pier kit mounting bolt size: [redacted]
- Mid-pier kit mounting bolt and messenger retainer plate bolt size: [redacted]
- Grounding Clamp bolt/nut: [redacted]

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