



A Furukawa Company

Installation Practice for EZ-Bend® Outdoor/Indoor Bundled MDU Cable Assembly

Contents	Section
Description.....	1.0
Product Offering.....	2.0
Product Labeling.....	3.0
Messenger.....	4.0
Living Unit Fibers.....	5.0
Installation Configurations.....	6.0
FTD Installation.....	7.0
Hardware.....	8.0

1.0 DESCRIPTION

The EZ-Bend® Outdoor/Indoor Bundled MDU Cable Assembly is used to place one cable instead of multiple EZ-Bend® 4.8 single fiber assemblies on the outside of a five or six story MDU. The five or six fiber bundle allows construction technicians to pre-position the drops by placing a single fiber twenty foot coil along the exterior of a building, to provide service to each of the living units within the building.

The EZ-Bend® Outdoor/Indoor Bundled MDU Cable Assembly utilizes the approved single fiber EZ-Bend® Outdoor/Indoor Cable used in applications today. The only differences are the bundled cable assembly has each individual EZ Bend® cable identified by connector number printed on the cable sheath and the buffered fiber in the cable construction is color coded blue through slate for ease in splicing and designating the living unit.

EZ-Bend® fiber technology is based on a novel, patent-pending fiber design that utilizes a unique refractive index profile to prevent light from escaping the fiber core. This novel design significantly improves the fiber's bending performance to far beyond ITU G.657B requirements, while maintaining compatibility with ITU G.652 and G.657 fibers and standard termination procedures. EZ-Bend® fiber is constructed of solid glass to avoid splicing, connector polishing, and connector cleaning issues associated with hole-assisted fibers.

EZ-Bend® 4.8 mm cables use a patent-pending construction that provides minimal macro-bending loss while ensuring long-term mechanical reliability of the

glass fiber when the cable is routed around sharp corners without use of bend limiters.

EZ-Bend[®] 4.8 MM Cables provide excellent attenuation performance with minimal bend restrictions. The EZ-Bend fiber is capable of a 360° turns around 5 mm radius mandrel with a maximum induced bending loss of less than 0.1 dB at 1550 nm or 1310 nm.

2.0 PRODUCT OFFERING

The EZ-Bend[®] Outdoor/Indoor Bundled MDU Cable Assembly utilizes the approved single fiber EZ-Bend[®] Outdoor/Indoor Cable used in applications today. The only differences are the bundled cable assembly has each individual EZ-Bend[®] cable identified by connector number printed on the cable sheath and the buffered fiber in the cable construction is color coded blue through slate for ease in splicing and designating the living unit.

The blue buffered fiber (identified as cable one) is always at the window closest to street level. This product is available in fifty, one hundred, one fifty and two hundred-foot tail lengths with five or six fiber tethers. The product comes in 16 configurations determined by the length, number of individual fibers and feed up or feed down configuration.



Cable identification and colored fiber.

3.0 PRODUCT LABELING

The bundles are shipped with each individual fiber jacket marked CONN 1 up to CONN 6 every two feet. The cables are labeled with identification labels wrapped on the cable and messenger at the end of the bundle and at the orange alignment marker.



4.0 MESSENGER

Each bundle will have a “Messenger” unit that is used to attach at the roof and the base of the building. The bundles will be anchored with standard Verizon hardware: “Drop Wire Vice” or “P Clamp” and “Rams Horn” anchored at the top on the inside knee wall (parapet) of the roof and at the bottom below the first floor window. P Clamps or Wire Vice 5026 may be used.



Rams horn and wire vice with “Messenger” on parapet wall and below bottom window.

Note: When installing the “Messenger” into the wire vice it is easier if the messenger is cut at an angle cleanly with a sharp razor knife. This will prevent the material from hanging inside the compression spring.



“Messenger” cut at an angle.

The cut “Messenger” end should be capped with a rubber cap for protection from the environment after placing in the wire vice.



Open “Messenger” with protection cap.

5.0 LIVING UNIT FIBERS

Twenty feet of fiber cable with a sealed SC 8° APC connector is available at each window for placement into the living unit. The coil is held in place by two cable

ties that will be cut when cable is ready for placing into the living unit. A third cable tie is placed around the cables to hold the SC APC connector in place and should be removed to access the connector for removing seal and placing into the living unit.



MDU coil with sealed SC 8° APC connector.

The EZ-Bend® Outdoor/Indoor Bundled MDU Cable Assembly has an orange alignment marker at the top and bottom coil for ease of floor alignment when viewing from the top of the building or from street level.



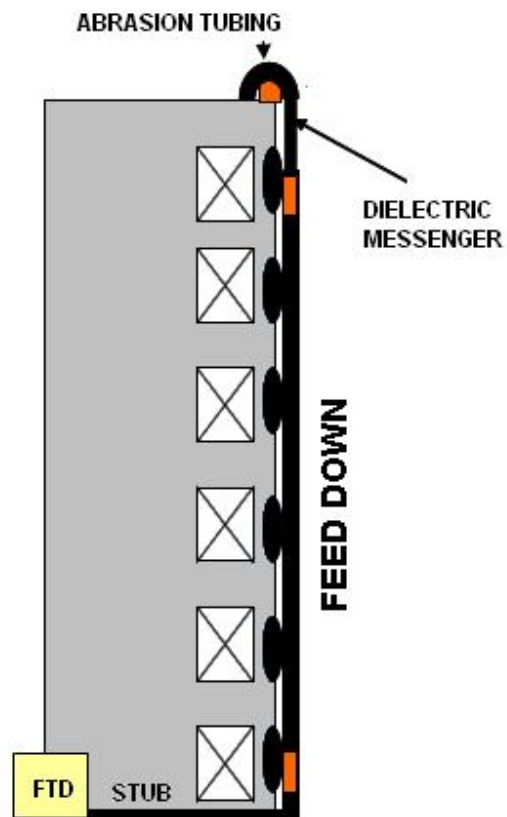
Orange alignment marker viewed from top of building and bottom window.

6.0 INSTALLATION CONFIGURATIONS

There are two main installation configurations: Feed Down and Feed Up

6.1 FEED DOWN INSTALATION

For Feed Down, the dielectric “Messenger” will pay off first from the hand coil, it will be pulled up the building and secured to the inside knee wall of the roof.



The following steps should be followed during a Feed Down installation of the EZ-Bend® Indoor/Outdoor Bundled MDU Cable Assembly:

1. Remove the EZ-Bend® bundled cable assembly from plastic bag and lay the coil flat with the “Messenger” wire feeding from the top of the bundled cable assembly coil. “Messenger” coil is located in a separate plastic bag and labeled “MESSENGER”.
2. Release the two Velcro straps for removal of the MDU coils.



3. Lower a hand-line from roof top to street level.
4. Tie the hand line to the 20’ “Messenger”.
5. Pull up the bundled cable assembly with hand line until “Messenger” reaches the top of the building.

6. The orange markers should be in alignment with top and bottom windows of the MDU. Remove the two white cable ties for additional cable if needed.

Top of building placement:

7. Place abrasion resistant (tube or bracket) where “Messenger” passes over the parapet (knee wall.)



Abrasion resistant brackets

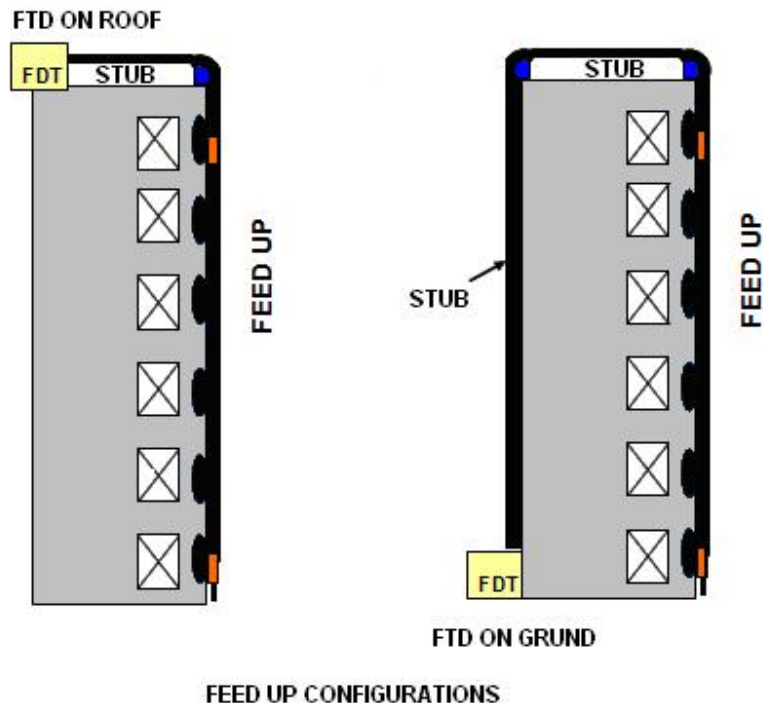
8. Place the “Messenger” into the abrasion resistant tube or bracket with cable ties.
9. Cut the “Messenger” at a clean angle and attach the wire vice to the “Messenger” while leaving several feet of excess “Messenger” for adjustment.
10. Confirm the top and bottom coils are adjusted at the windows.
11. Mark location and anchor ram's horn to the inside of the parapet (knee wall). Place the wire vice in the anchor and tighten the “Messenger”. Secure excess “Messenger” to the taught “Messenger” with cable ties and place protective cap on the open end.
12. Complete securing the “Messenger” to the abrasion resistant brackets by tightening the cable ties.

Street level placement:

13. At the bottom of the building check to insure cable is in correct location relative to the windows and is not obstructed with other service wires. Cut the “Messenger” free from the bundle long enough for securing in the wire vice. Cut the “Messenger” at a clean angle.
14. Pull the bundled cable tight and mark location for anchoring.
15. Anchor the ram's horn to the building.
16. Place the wire vice onto the “Messenger”. Attach the wire vice into the anchor and tighten “Messenger” by pulling down in the wire vise where the bundled cable lays flat against the building. Secure any slack “Messenger” to the Taught “Messenger” with cable ties. Place protective cap on open end of “Messenger”.
17. Cut the two white cable ties and run the balance of the bundled cable assembly to the FDT.
18. Run the bundled cable to the FDT mounted on the building wall with D-rings for lateral support.

6.2 FEED UP INSTALATION

For Feed Up, the dielectric “Messenger” will be lowered down and secured at the bottom of the building and secured to the inside knee wall of the roof.



The following steps should be followed during a Feed Up installation of the EZ-Bend[®] Indoor/Outdoor Bundled MDU Cable Assembly.

Top of building placement.

1. Take the bundled cable assembly to the roof of the building. Remove the EZ-Bend[®] Bundled MDU Cable Assembly from plastic bag and lay the coil flat with the “Messenger” coil feeding from the top of the bundled cable assembly. The “Messenger” coil is located in a separate plastic bag and labeled “MESSENGER”.
2. Release the two Velcro straps for removal of the MDU coils.
3. Lower the Messenger over the parapet (knee wall) to the street level at front of the building or in the air shaft and check that the top floor coil is

positioned correctly. The orange marker tape should align with the top window sill. Be sure the “Messenger” reaches street level and is not tangled with existing service wires.

4. Place the bundled cable assembly into the abrasion tube or bracket with cable ties.



5. Cut the “Messenger” free from the bundle long enough for securing to the parapet (knee wall). Cut the “Messenger” at a clean angle.
6. Attach the wire vice to the “Messenger” leaving several feet of excess “Messenger”.
7. Confirm the top and bottom coils are adjusted to meet the windows.
8. Mark location and anchor rams horn to the inside of the parapet (knee wall). Place the wire vice in the anchor. Secure excess “Messenger” to the “Messenger” attached to the wire vise with cable ties. Place protective cap on open end of the “Messenger”.
9. Complete securing the bundled cable to the abrasion resistant brackets by tightening the cable ties.
10. Remove the white cable ties for remaining bundled drop and route around the parapet (knee wall). Watch the coil and keep cable from becoming tangled. Cable should pay off correctly. Support the bundled cable assembly around the parapet (knee wall) with appropriate number of D rings for horizontal support.



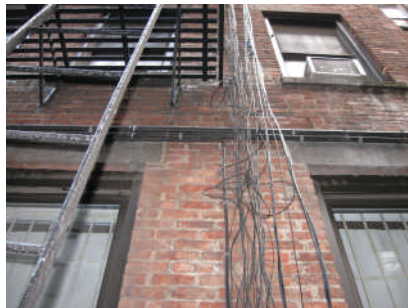
D rings for horizontal support on knee wall.

11. If the FDT is located on top of the building locate the terminal end and place in the FDT.
12. If the FDT is located at the bottom of the building lower the remaining bundled drop assembly to street level.
13. Place the bundled cable assembly into the tube or bracket with cable ties.
14. Cut the “Messenger” free from the bundle long enough for securing to the top parapet (knee wall). Cut the “Messenger” at a clean angle.

15. Attach the wire vice to the “Messenger” leaving several feet of excess “Messenger”.
16. Mark location and anchor rams horn to the inside of the parapet (knee wall). Place the wire vice in the anchor. Secure excess “Messenger” with cable ties and cover open end with protective cap.
17. Complete securing the bundled cable to the abrasion resistant brackets by tightening the cable ties.

Street level placement

18. At the street level of the first drop location secure the “Messenger” to the building. At the bottom of the building check to insure cable is in correct location relative to the windows and is not obstructed or tangled with other service wires.
19. Cut the “Messenger” at a clean angle and attach the wire vice to the “Messenger” while leaving several feet of excess “Messenger”.
20. Confirm the top and bottom coils are adjusted to meet the windows.
21. Mark location and anchor rams horn to the side of the building. Place the wire vice in the anchor and tighten the “Messenger” by pulling down in the wire vise. Secure excess “Messenger” to the taught “Messenger” with cable ties and cover open end with protective cap.
22. At street level of the building on the FDT side check to insure cable is in correct location relative to the windows and is not obstructed or tangled with other service wires. Cut the “Messenger” loose from the bundle long enough for securing in the wire vice. Cut the “Messenger” at a clean angle.



Confirm Bundled Cable Location.

23. Pull the bundled cable tight and mark location for anchoring.
24. Attach the wire vice to the “Messenger” while leaving several feet for tightening.
25. Mark location and anchor rams horn to the side of the building. Place the wire vice in the anchor and tighten the “Messenger” by pulling down. Secure excess “Messenger” to the taught “Messenger” with cable ties and cover end with protective cap.
26. Run the balance of the bundled cable assembly to the FDT.



27. Secure the bundled cable in the horizontal to the building wall with D-rings.

7.0 FDT INSTALATION

Construction will be responsible for prepping the tails to be spliced and labeling the bundles and terminal with IPIDS, Apartment #'s, location, etc. This will follow the Pre-connect Assignment section noted in V-build which will enable the pre-assignments of the drops.

1 Determine the required length of cables for maintenance storage and routing inside the FDT. Cut off excess cable if required. Store and secure the maintenance cable. Feed the cables inside the FDT and organize for splicing.



Maintenance coil storage and entering FDT.

7.1 EZ-Bend® Cable Stripping Procedure

1 Safety glasses and gloves should always be worn when handling and stripping fiber cables. Pieces of bare fiber are very sharp and can injure the eye and puncture the skin.

2 Required tools:

- Conventional "T" Strippers
- Sidecutters
- Electricians Scissors or Snips
- Clauss No-Nik® Fiber Strippers
- Ceramic Scissors (Optional)
- Seam Ripper (Optional)

3 The length of exposed tight buffer and bare fiber will vary depending on the application. Consult termination specifications for the required cable and fiber stripping lengths. Mark the PVC jacket at the desired stripping length.

4 Using the appropriate gauge on the "T" Strippers carefully cut the PVC jacket at the mark and pull the jacket away to expose the aramid yarn. The

correct gauge for 3.0 mm jacket is 16 AWG and the correct gauge for 4.8 mm is 10 AWG. The correct gauge can also be determined by starting with the larger hole and proceed to a smaller hole until the PVC jacket is cut and stripped without cutting into the aramid yarn.

5 Using either the ceramic scissors or the electricians' snips cut the aramid yarn at the predetermined length.

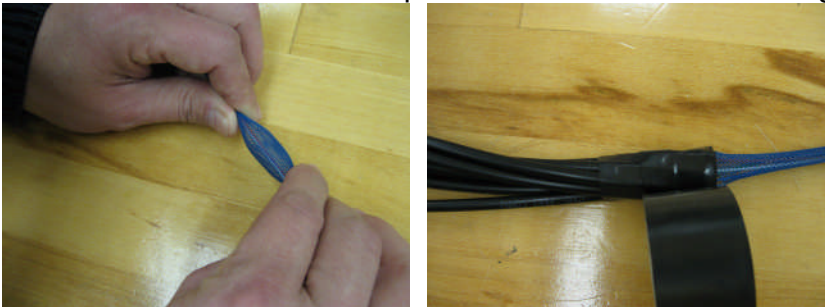
6 The tight buffer is now ready to be stripped from the fiber. The correct Clauss No-Nik fiber stripper must be determined. Please note that alternative fiber strippers such as Miller strippers are also acceptable for use during this process.

(a) If it is desired to strip the 900 um tight buffers down to the bare 125 um fiber, it should be stripped using the No-Nik NN200 tool (red handle).

(b) Alternately, it may be desirable to take one coating off at a time. Use the No-Nik NN300 tool (white handle) to strip the tight-buffered coating off the 250 um coated fiber. Next, use the NN200 tool (red handle) to remove the fiber coating and expose the 125 um bare fibers.

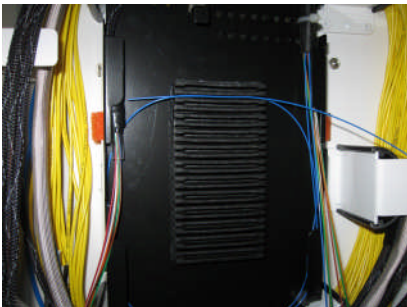
7. Organize the cables for routing by taping the bundle together and placing supplied mesh over the colored buffered fibers.

8. The best method is to compress the mesh and slide along the fibers.



9. At the end of the bundle place the mesh over the cables and secure with tape. Identify the individual MDU fibers.

10. Route the fibers in the FDT and leave exposed fiber for splicing.



8.0 HARDWARE



Bend Limiter



Abrasion Resistant tubing



Dielectric Messenger Strain Relief Hardware:

Product ID: 400121513

Short Description: CLAMP WIRE DROP STAINLESS



MACLEAN Wire Vise 5062



B Drop Wire Hook (Ram's Horn): 400315156

Wall mount Bracket:

Product ID: 400314571

Short Description: BRACKET HOUSE CA04591 100/PK



D Rings for Horizontal Cable Storage



Angled Wall Mount Bracket

Product ID: 400017836

Short Description: BRACKET CORNER L 46L232 C/T 11028951

Masonry Anchors

Tensioning Bolts: 5/16 x 3" Bolts Product ID: 40013579

For Tensioning Drop Wire Clamp

If you have any questions or require additional information, please contact OFS at 888-FIBER-HELP (888-342-3743).