Instructions for Preparing

ADSS AND UNARMORED LOOSE TUBE CABLE

IN THE OPTI-GUARD™ SPLICE ENCLOSURE

NOTE:

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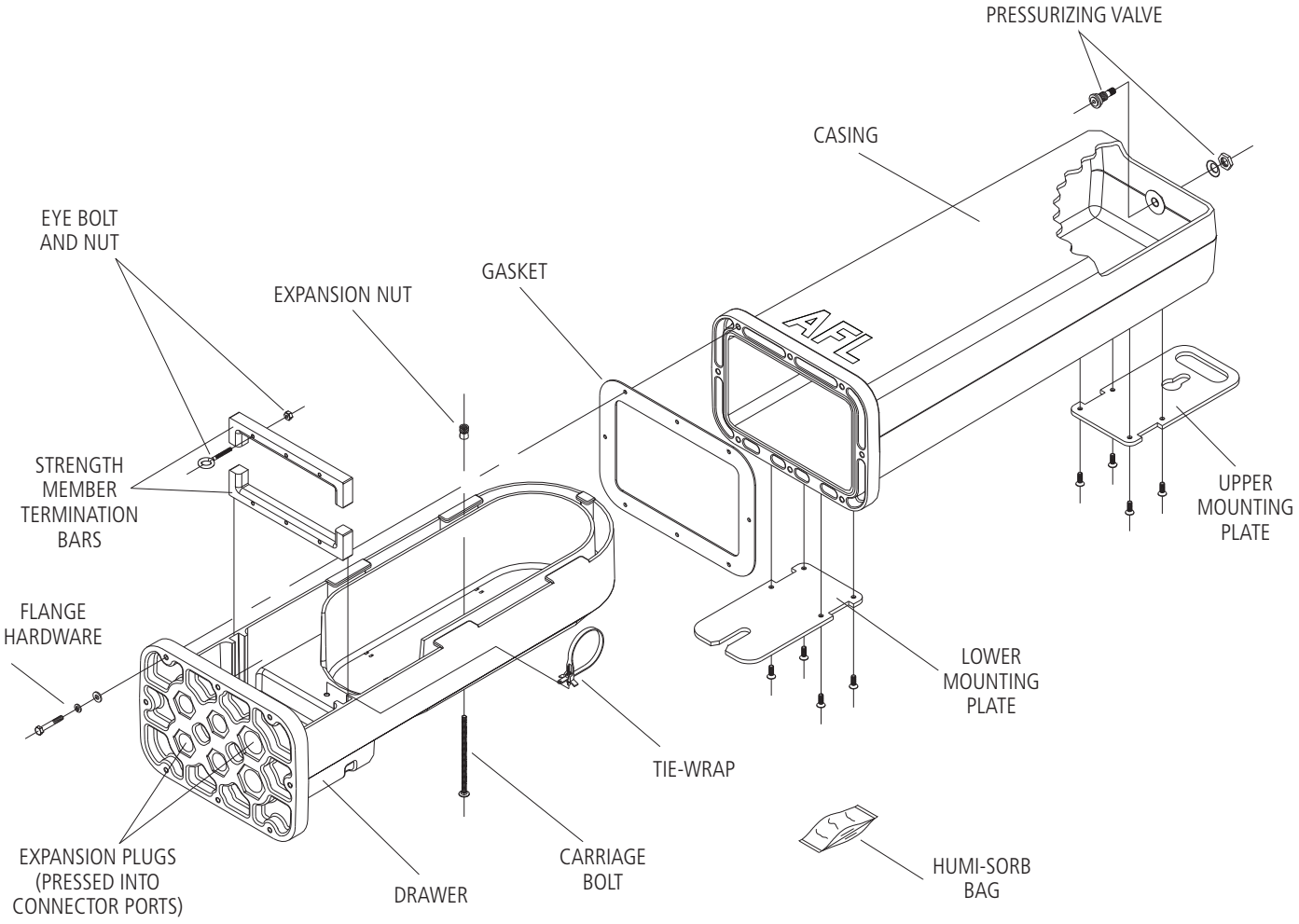
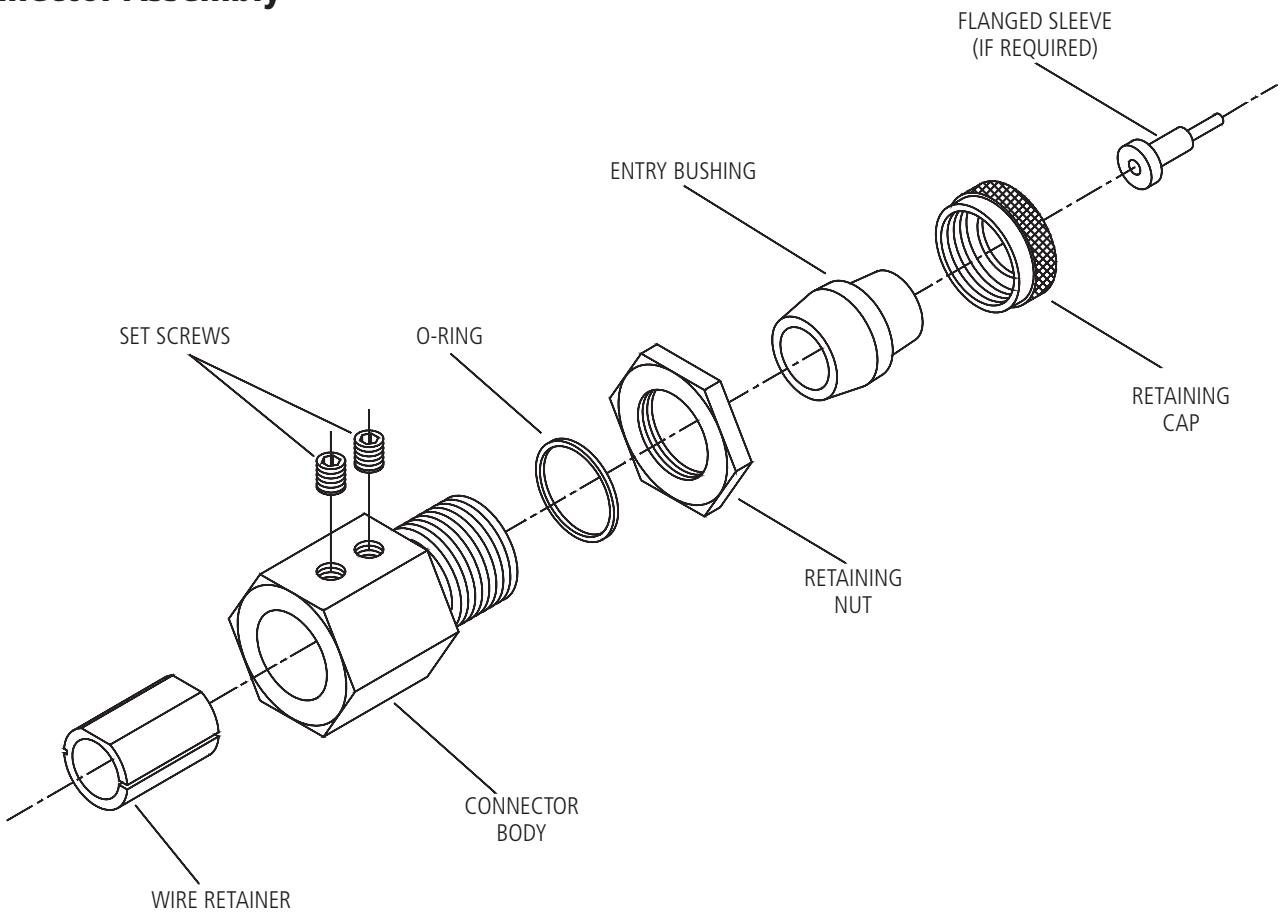
List of Materials

ITEM	DESCRIPTION	QTY
1	Splice Enclosure Assembly (consisting of the Casing, Drawer and related parts)	
	Casing (NOTE: Parts listed below are factory assembled on casing):	
	Upper Mounting Plate	1
	Lower Mounting Plate	1
	Flat Socket Head Cap Screw	8
	Pressurizing Valve	1
	Drawer (NOTE: Parts listed below are factory assembled on drawer):	
	Adhesive Backed Gasket	1
	Tie Wrap Retainer	1
	(NOTE: Parts listed below are removable from drawer):	
	Expansion Plugs	6
	Strength Member Termination Bars	2
	Eye Bolt (part of Termination Bar)	6
	Lock Nut (part of Termination Bar)	6
	Carriage Bolt (for Splice Tray retaining)	1
	Extension Nut (for Splice Tray retaining)	1
	Hex. Head Bolt (flange hardware)	8
	Lock Washer (flange hardware)	8
	Flat Washer (flange hardware)	8
	Humi-Sorb Bag	1
2	Connector Assemblies (the following comprise one connector):	
	Connector Body	1
	Retainer Nut	1
	Entry Bushing	1
	O-Ring	1
	Retaining Cap	1
	Range-Taking Flanged Sleeve	1
	Wire Retainer	1
	Set Screws	2
3	Splice Tray Assembly	
	Tray	1
	Cover	1
	Manifold	2
4	Splice Protector Sleeves	Order separately based on actual fiber count

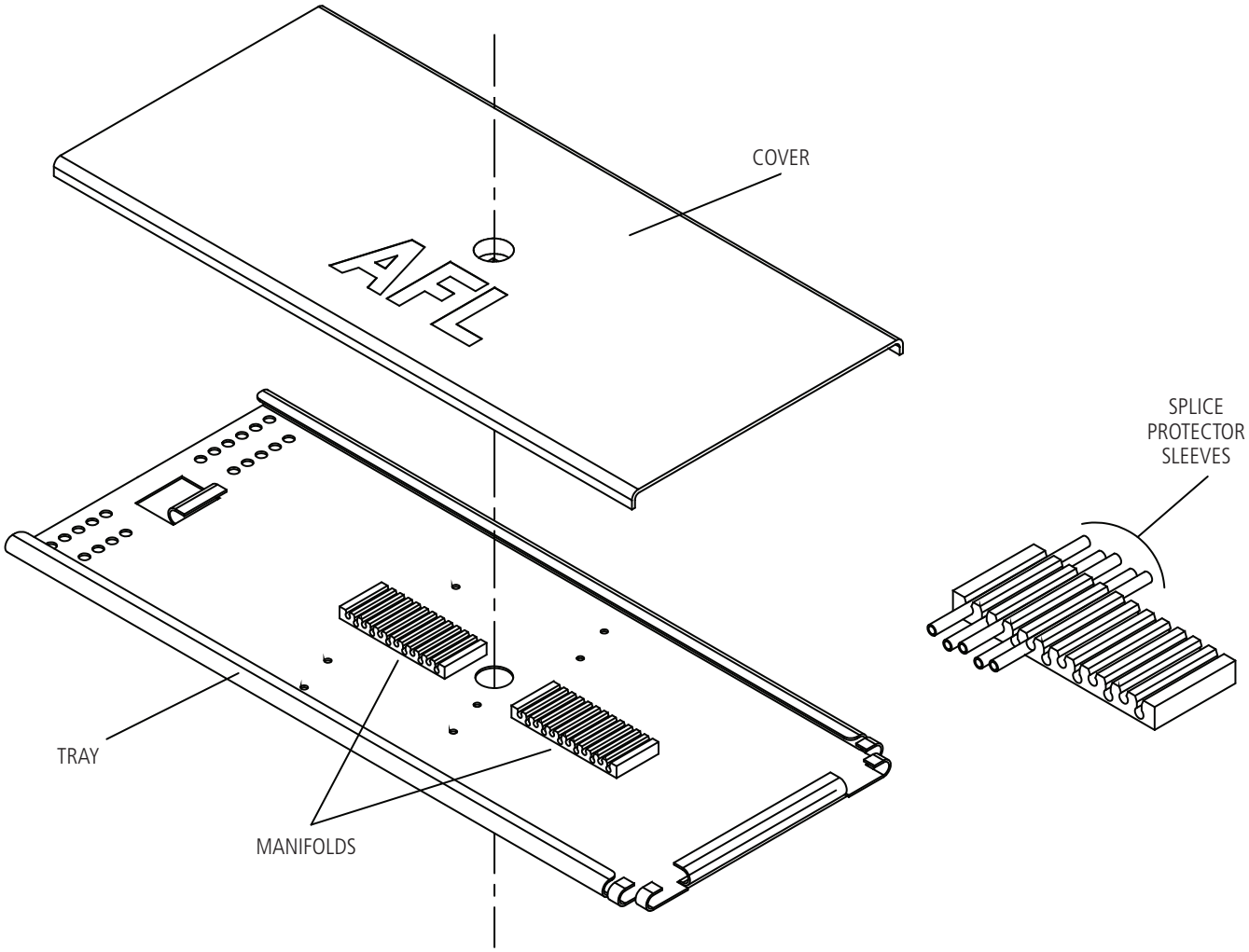
Opti-Guard™ Splice Enclosure Assembly



Connector Assembly



Splice Tray Assembly



1.0 Purpose of Installation

The purpose of installing optical cables into a splice enclosure is to connect the individual fibers of the cables, providing a continuous light path, while protecting the connection in a sealed enclosure.

2.0 Scope

This document describes and illustrates the installation of ADSS and unarmored loose tube fiber optic cables into the AFL OPTI-GUARD splice enclosure. This enclosure has the following advantages:

1. Light weight;
2. No sealers or tapes required;
3. Maintenance friendly (no re-entry kits required);
4. Standard capacity of up to 360 single-fusion fiber splices;
5. Accepts various splice tray types; and
6. Accepts up to 6 cables.

3.0 Precautions

3.1 Health

Optical fibers are very thin, fragile and sharp. Therefore, careful handling is required to avoid either damage to the delicate glass fibers or, more importantly, injury to the technician or bystander. Small fiber scraps should be deposited on strips of adhesive tape, placed in a bottle or vinyl bag, and properly disposed. Do not eat or drink when working with optical fibers, as small pieces of glass may inadvertently be ingested. Never look directly at the end of a fiber unless certain that no laser light is being transmitted through the fiber.

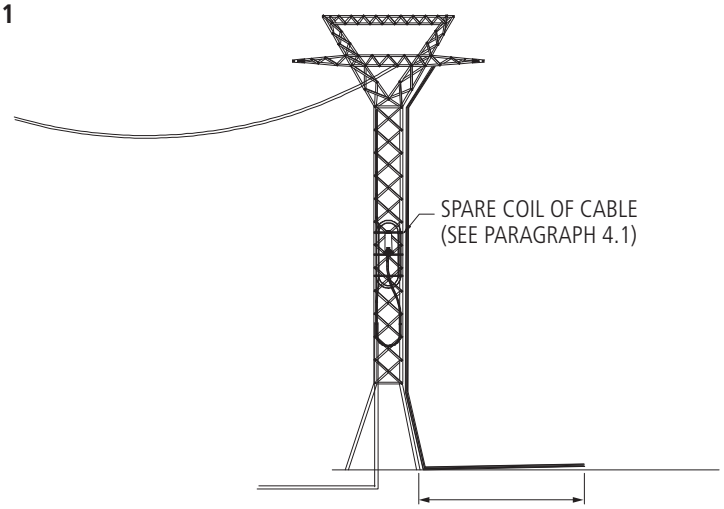
3.2 Work Environment

Handle optical fibers and fiber cable carefully, taking care to impose no damage by physical shock or sharp bends. During the actual splicing, care must be taken to keep hands and work area clean in order that the fibers may be kept clean. Dirty fibers mean poor splices! Keep all tools and equipment in their proper cases or storage pouches when not in use. Consideration should be given to the work area in which the splice enclosure will be organized. A clean, snag free horizontal surface (protected from the wind) is necessary.

4.0 Cable Preparation

4.1 A coil of 100 ft. (30.5 m) of cable on the tower is an example value, with a minimum amount of coil on each structure set at 40 foot (12.2 m). After the stringing procedure there should be a minimum of 100 ft. (30.5 m) of cable from each pulling direction at the tower. The 100 ft. (30.5 m) of cable is measured from the base of the tower (see Fig. 1). **IMPORTANT:** The coil of cable must be stored on structure prior to preparing the enclosure. Only uncoil the amount of cable required for installation.

Fig. 1

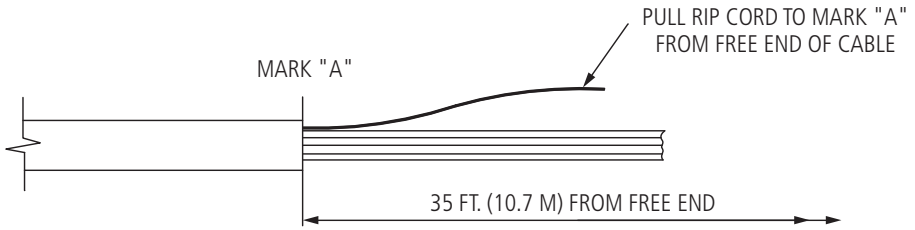


4.2 Due to the fact that the splice enclosure must be prepared on the ground, all cables should have sufficient slack as to permit them to be coiled neatly on the tower (see Figure 1). Form the cables into drip loops where they enter the splice enclosure.

4.3 Measure 35 feet (10.7 meters) from the end of each individual cable and mark location "A" at that point. When marking the cables, use yellow or another contrasting color tape to aid in visibility. This will give 35 feet (10.7 meters) of optical fiber for storage and splicing in the splice enclosure. Secure both cables to a workbench or table, so that they are held rigidly in place. Use of a tower guide clamp attached to the workbench is a good way of clamping the cable.

4.4 Expose 4 to 6 inches (102 to 152 mm) of the ripcord at the free end of the cable. Before pulling the ripcord, be sure to carefully ring-cut the cable at mark "A". Grip the ripcord and pull to mark "A" (see Fig. 2). Remove the jacket.

Fig. 2



4.5 If aramid yarn is present in the cable, measure and mark 20 inches (508 mm) from point "A" toward the loose end of the cable. Cut the aramid yarn at this 20-inch (508 mm) mark and remove yarn from that point to the end of the cable. Should the cable have a second, inner jacket, carefully ring-cut this inner jacket at point "A". At the loose end of the cable, expose 4 to 6 inches (102 to 152 mm) of the ripcord. Grip the ripcord and pull to point "A". Remove the inside jacket.

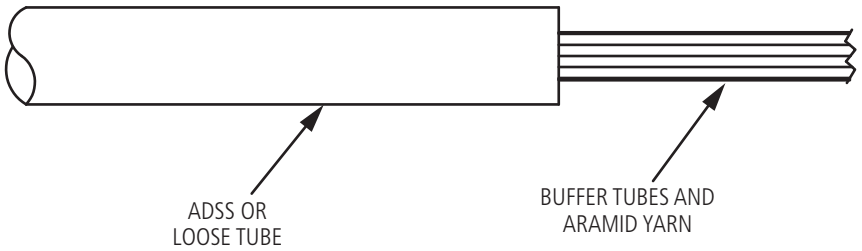
4.6 Next, remove the Mylar and binders from the loose end of the cable, (a seam ripper works well; however take care not to cut or puncture the fiber bearing tubes).

4.7 After all of the binders are removed, carefully roll out the (FRP) central strength member. Be very careful not to collapse the fiber bearing tubes.

5.0 Cable to Splice Enclosure

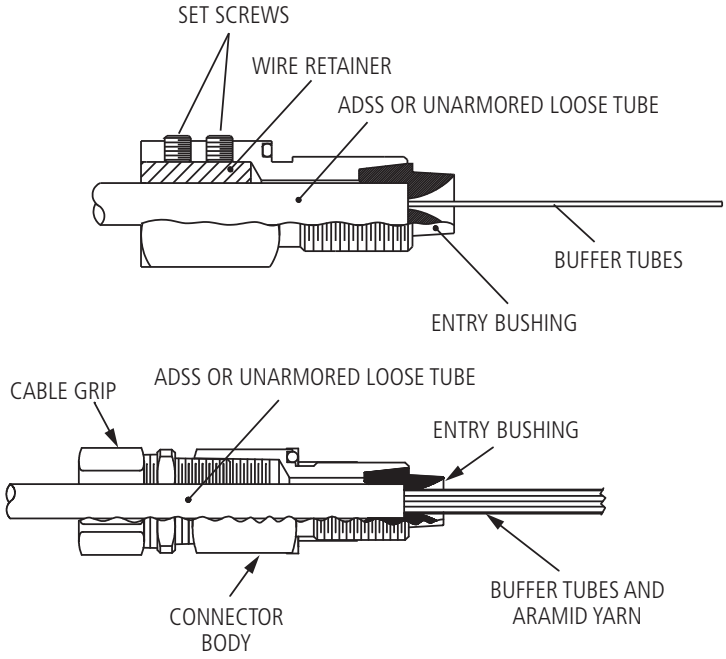
5.1 After the cable has been prepared (see Fig. 3), slide the connector assembly over the buffer tubes, aramid yarn, and outer jacket of the cable. Position the cable inside the connector assembly as is shown in Fig. 4.

Fig. 3



5.2 Slide the entry bushing over the buffer tubes. Position the entry bushing in the connector body and around the outer jacket of the cable as is shown below. The flat surface of the wire retainer Make certain that the bushing is seated in the connector body properly (see Fig. 4).

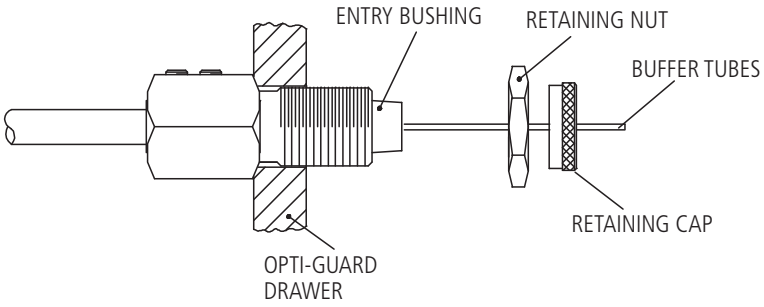
Fig. 4



5.3 Locate the cable port of the OPTI-GUARD drawer into which the cable is to be installed. Remove the appropriate port plug by knocking the plug out of the splice enclosure drawer from the inside outward using a hammer, punch, or screwdriver. An alternative method for removing the plug is to drill a ¼" hole in the approximate center of the plug, then use the tip of a screwdriver to "lever-out" the plug. Take care not to damage the cable port during plug removal – particularly the outer surface, since the connector's O-ring will seal against the bottom of the port hex. **NOTE:** Do not remove a plug unless a connector will be installed in that port!

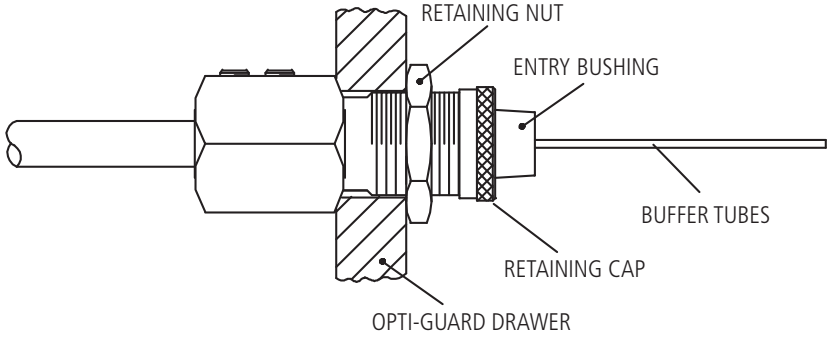
5.4 Slide the buffer tubes, aramid yarn, and connector body through the port. Position the connector body in the enclosure – making certain that the O-ring is clean and is properly in position – and slide the hex nut and retaining cap over the buffer tubes and aramid yarn (see Fig. 5).

Fig. 5



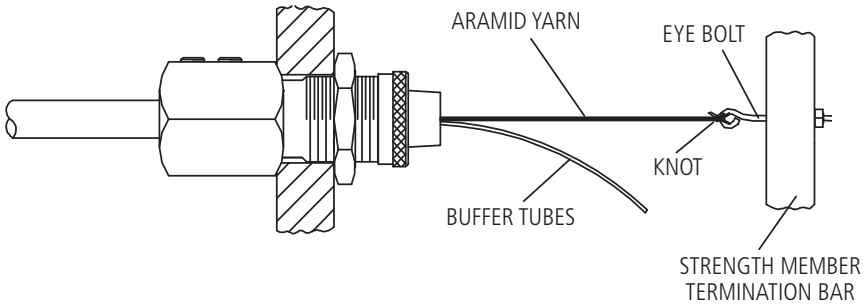
5.5 Tighten the hex nut onto the connector body, against the inside of the drawer. The body of the connector should "socket-fit" into the hexagonal face of the enclosure port. Tighten the retaining nut over the silicone bushing (see Fig. 6).

Fig. 6



5.6 For ADSS and/or unarmored loose tube cables that may not have a central strength member outside of the buffer tubes, tension for the cable will be born by the aramid yarn. Thread the aramid yarn through the strength member termination eyebolt and pull the yarn. Wrap the aramid yarn around the eyebolt twice, and then tie a series of half-hitch knots (see Fig. 7). Make certain that the yarn is tied off in line with the eyebolt. Trim unwanted yarn (additional tensioning may be accomplished by tightening the nut of eyebolt). Tape the buffer tubes together every 2 feet (0.6 m). Place the final tape around the buffer tubes 6 feet (1.8 m) from the free end.

Fig. 7



5.7 For ADSS and/or unarmored loose tube cables that incorporate a central strength member, remove the eye bolt and pass the central strength member through the strength member termination bar and range – taking flanged sleeve (see Fig. 8). The central strength member shall extend to the farthest possible end of the applicable flanged sleeve range section (see Fig. 8.1). Apply the maximum tension to the central strength member and compress the flanged sleeve tightly over the central strength member with a standard crimping tool. Trim any excess central strength member if it has been allowed to pass completely through the range-taking flanged sleeve.

Fig. 8

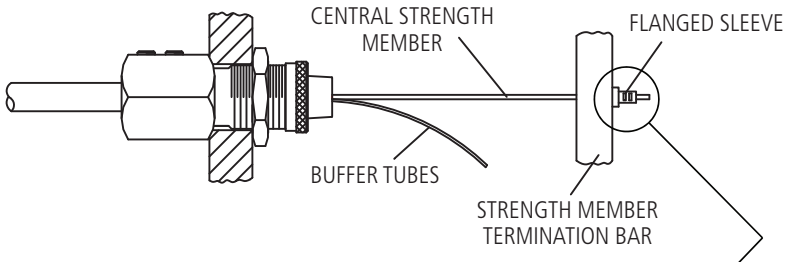
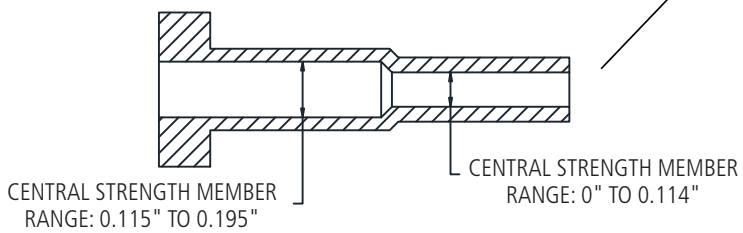


Fig. 8.1



6.0 FIBER AND BUFFER TUBE PREPARATIONS

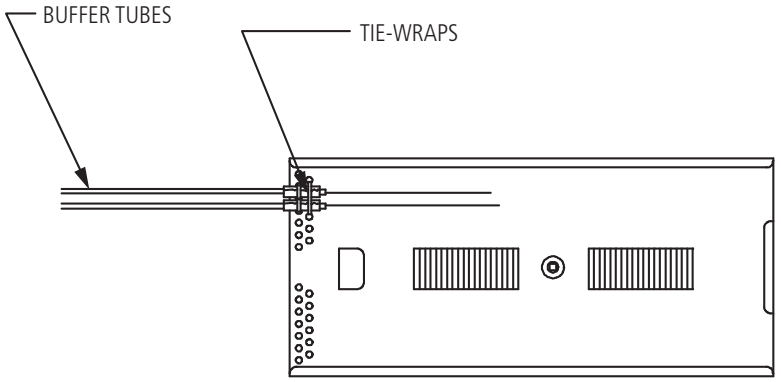
6.1 Starting at the free end of one of the cables, separate the individual colored buffer tubes – one at a time – by unlaying them to the 6-foot (1.8 m) tape mark.

6.2 Mark the individual colored tubes 6 feet (1.8 m) from the free end with a permanent marker. With a buffer tube cutter, ring cut the tube at the 6 foot (1.8 m) mark. One or two revolutions will score the tube enough. Remove the buffer tube cutter. Grip the buffer tubes on either side of the scored area and bend the tube back and forth until it breaks. Remove the buffer tube slowly, exposing the fibers.

6.3 Remove the gel from the fibers.

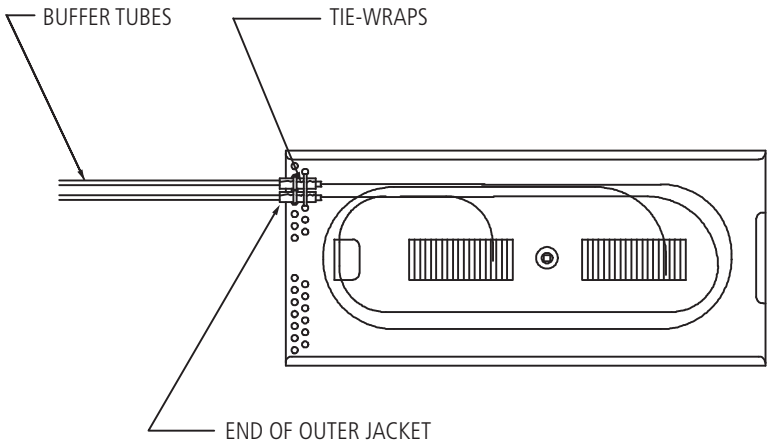
6.4 After the like tubes (blue to blue) have been prepared, cleaned and separated, tape the like tubes together by wrapping a piece of cushion tape (felt tape, velveteen tape and double-sided adhesive tape are common material selections) around the tubes, approximately 1/4" (6.4 mm) away from the strip-back point. If a pressure-sensitive, single-side-adhesive tape, such as felt or velveteen tape is used, then apply the tape to the buffer tubes adhesive side outward. Place the taped section of the like tubes onto the splice tray and secure the taped section to the splice tray with a tie-wrap (see Fig. 9). Follow the same steps for the remainder of the like tubes.

Fig. 9



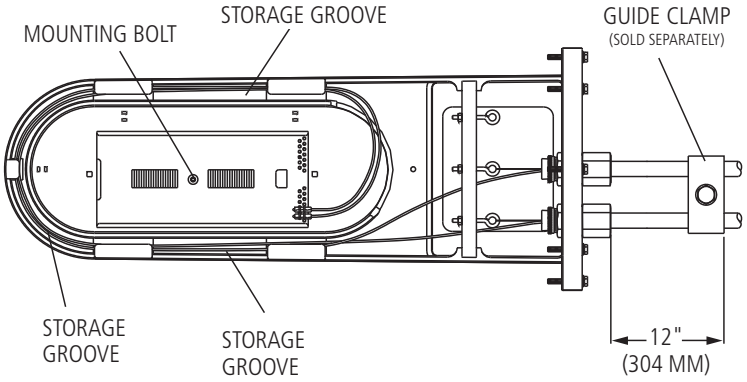
6.5 When cutting fibers to length, wrap 6 feet (152 mm) of fibers around the tray in a clockwise direction. Cut the fibers so that the spliced section will fit into the splice protector holders. Be sure that the fibers are cut and positioned in the color code order. Prepare the outside tube in the same manner. The first six fibers will be shorter than the last six in the outside tube (see Fig. 10). In the inside tube, the first six fibers will be longer than the last six. Place the splice tray cover onto the tray, making certain that all of the fibers are wrapped inside the splice tray. Prepare all trays in the same manner before splicing is performed**.**

Fig. 10



6.6 Follow the standard procedure for splicing fiber optic fibers in the splice trays. After the splicing has been completed, make sure that all the fibers are inside the trays. Make one wrap of fiber buffer tubes into the OPTI-GUARD storage groove and position the splice tray onto the mounting bolt. Repeat this procedure until all trays have been placed inside the enclosure. Place the extension nut on the bolt and tighten until snug (see Fig. 11).

Fig. 11

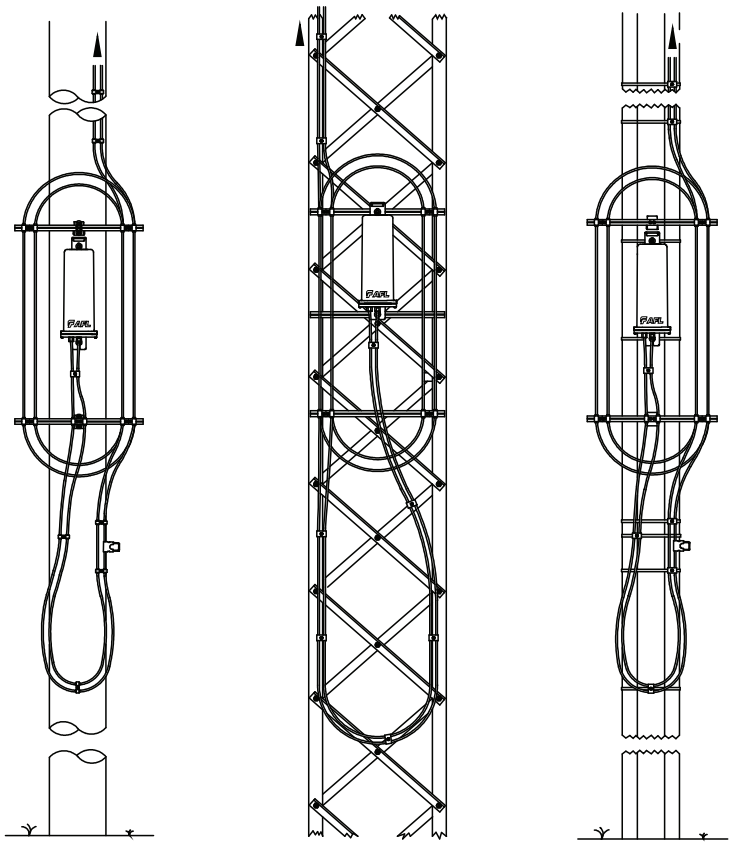


6.7 The drawer assembly is now complete and is ready to be installed into the enclosure. A pressure valve has been provided, to facilitate the purging of moisture (if required) and to pressurize to ensure a seal (10 psi (68 kPa) maximum pressure). Torque the bolts to 35 in-lbs (3.95 N·m). This will cause a visual protrusion of gasket of approx. 1/64 inch to 1/32 inch (0.4 mm to 0.8 mm) from the original position, providing an airtight seal.

6.8 **IMPORTANT:** Attach a guide clamp (sold separately) to each pair of cables approx. 12 inch (304 mm) from the bottom of the connector assembly before transporting the prepared enclosure. This will help prevent the cables from twisting inside the enclosure while transporting (see Fig. 11).

6.9 Secure the loose cable to the structure to complete installation (see Fig. 12).

Fig. 12



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