

- Be sure to read and understand this procedure completely before applying product.



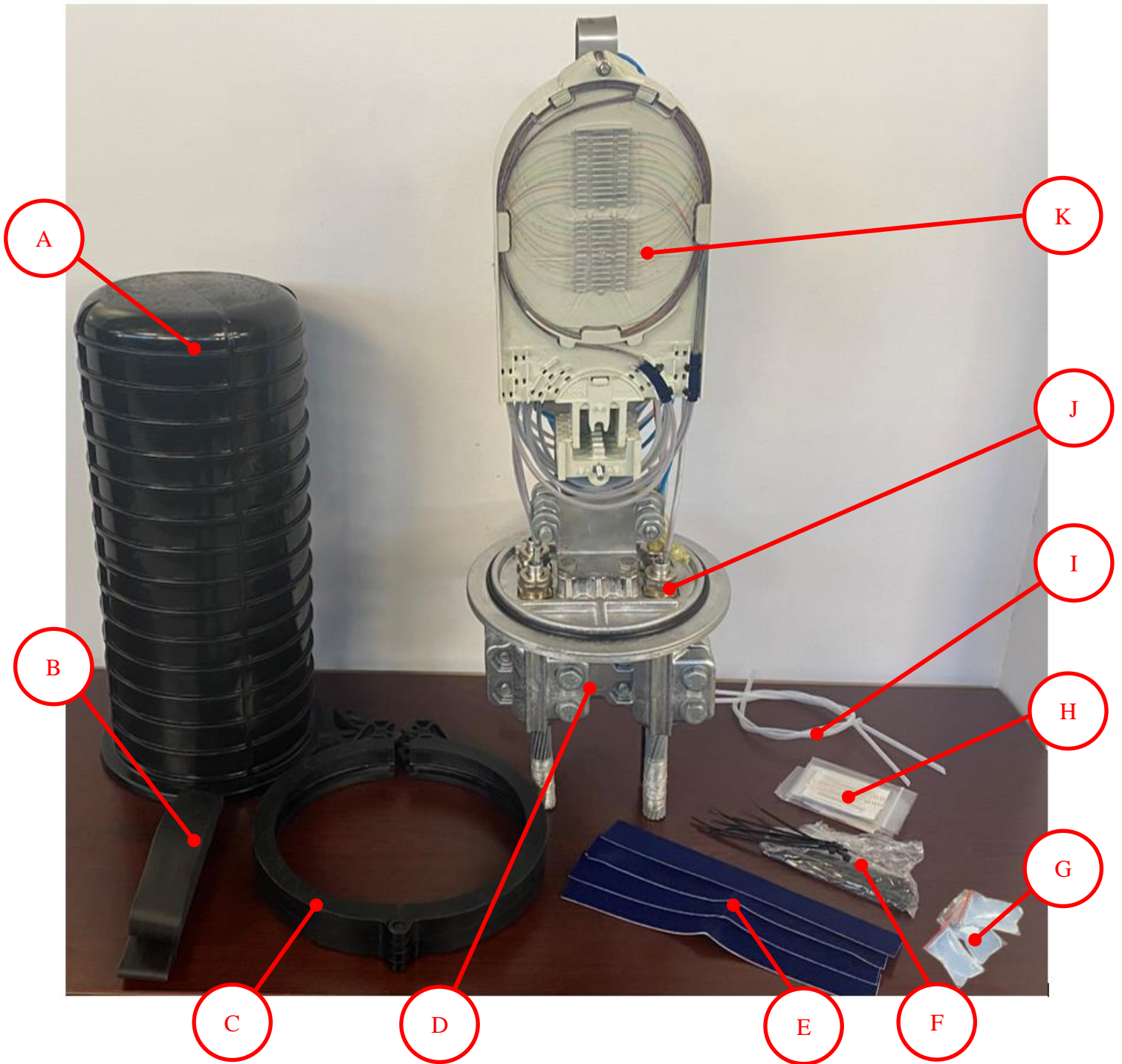
**These installation instructions are a guideline for trained craftspeople. Be sure to read and completely understand this procedure before applying this product**

**1. COMPONENT LIST**

1.1. Ensure that the splice closure is supplied with all components shown in Fig.1:

| Ref | Description                                       | Qty      |          |          |          |
|-----|---|----------|----------|----------|----------|
|     |   | 24 Fibre | 48 Fibre | 72 Fibre | 96 Fibre |
| A   | Closure Dome                                      | 1        | 1        | 1        | 1        |
| B   | Heat Shrink tube                                  | 0.4m     | 0.4m     | 0.4m     | 0.4m     |
| C   | Closure Collar                                    | 1        | 1        | 1        | 1        |
| D   | Keeper Assembly                                   | 1        | 1        | 1        | 1        |
| E   | Felt Strips (220mm)                               | 4        | 6        | 8        | 10       |
| F   | Cable Ties (100mm)                                | 32       | 48       | 64       | 80       |
| G   | Silicon Packets (5g)                              | 3        | 3        | 3        | 3        |
| H   | Splice Connection Protector                       | 24       | 48       | 72       | 96       |
| I   | Transportation Tubes (340mm)                      | 10       | 10       | 10       | 10       |
| J   | Gland Plugs                                       | 4        | 4        | 4        | 4        |
| K   | 24 Fibre Splice Tray +<br>1x96 Fibre Fan-out tray | 1        | 2        | 3        | 4        |

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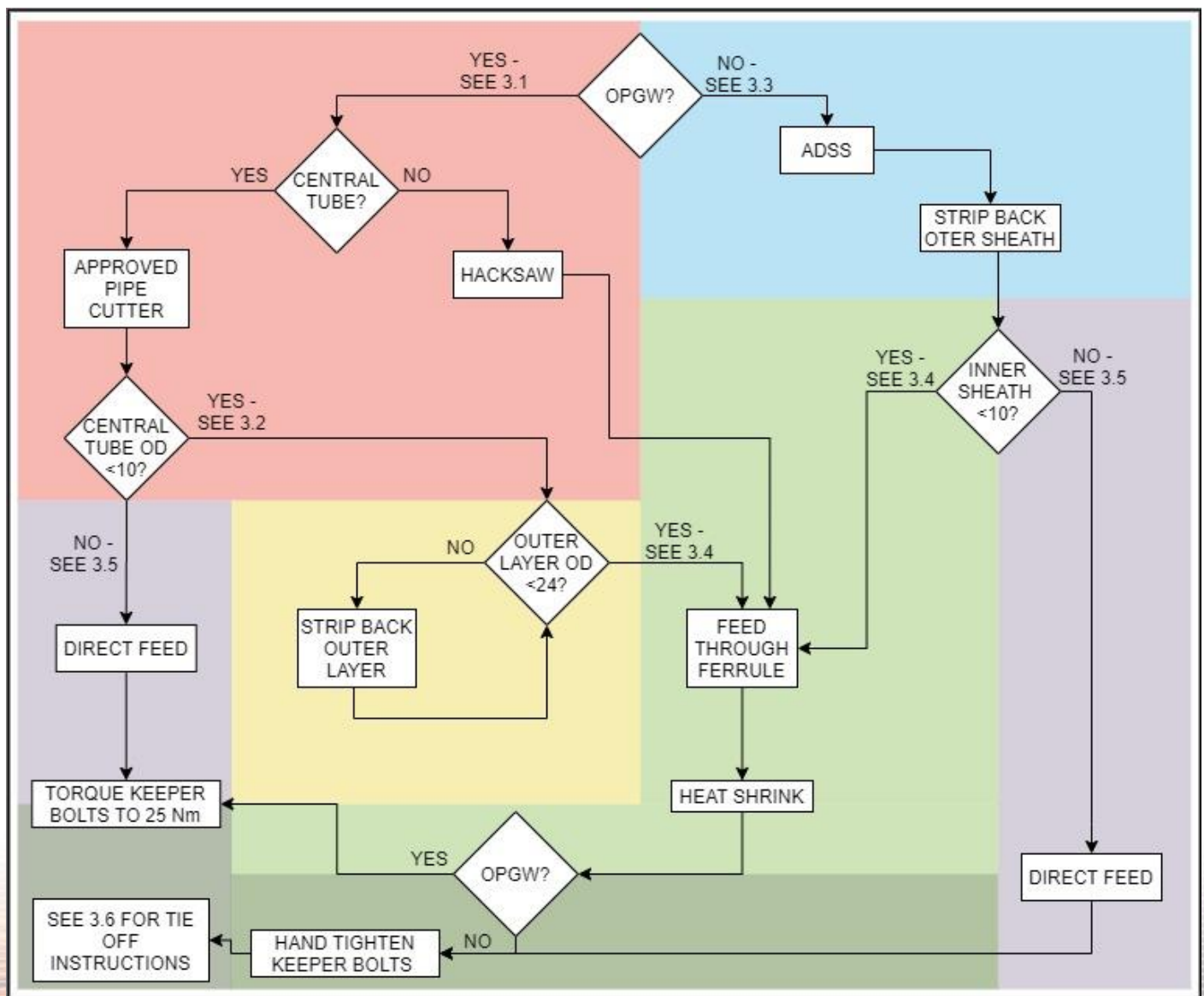
*Figure 1*

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## 2. SETUP

- 2.1. Mark the joint position on the tower at a height sufficiently above the anti-climb device that will allow for the joint to be returned to ground level or the working platform on the tower.
- 2.2. Clamp OPGW/ ADSS at a maximum of 2m intervals to the tower structure and at every cross section up to the Joint position and mark the cable.
- 2.3. Release the minimum number of clamps required to allow the cable ends to be brought to ground level or to the working platform for splicing.
- 2.4. Bind the cable at the mark to prevent flaring, this will be referred to as the original mark.

## 3. CABLE AND FIBRE PREPARATION

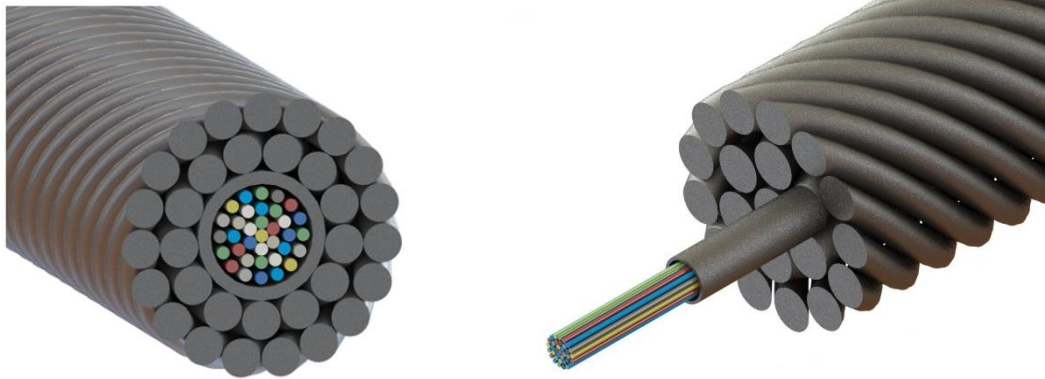


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### 3.1. Cable Identification and preparation (OPGW)

In this step, the type of OPGW will be identified to determine which cutting method and tools should be used.

- Step 1. Looking at the cross section of the OPGW, determine if the type is Stranded or Central Tube. (See Figure 2)



Centre Tube OPGW

Stranded OPGW

*Figure 2 OPGW Types*

- Step 2. Measure 2.5m of OPGW length from the tip.  
Step 3. For OPGW stranded type, using a hacksaw, cut off surrounding wires to isolate the strand containing the fibres. Be cautious not to cut or damage this strand.  
Step 4. For OPGW type with a Central Tube, use an approved pipe cutter to cut approx.  $\frac{3}{4}$  into the outside layer. (See Figure 3)  
Step 5. Unwind each layer and break them off at the point where the incision is.  
Step 6. Repeat steps 4 and 5 until the central tube is exposed.  
Step 7. If central tube OPGW, determine the diameter of the central tube.



*Figure 3 Approved pipe cutter*

### 3.2. Fibre Preparation (OPGW)

After these steps, the outer layers of the OPGW will be sized to fit through the reduction ferrule.

- Step 1. After determining that the central tube diameter is less than 10mm, determine the diameter of the outermost layer of OPGW.

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Step 2. If the diameter is less than 16mm then proceed to feed the central tube and the outermost tube through the ferrule, optical fibres first, until the OPGW can no longer be feed through.

Step 3. If the diameter of the outermost layer of OPGW is greater than 24mm, then strip back approx. 20mm of the outermost layer.

Step 4. Repeat step 3 until either the diameter of the outermost layer is below 16mm or the central tube is completely exposed. (See Figure 4)

*Tip: Before inserting OPGW into ferrules brush OPGW using a conductor cleaning brush or sandpaper and apply a conductive non oxide grease to the cable, this will prevent any oxidation once the clamp has been closed.*

### **3.3. Cable and Fibre preparation (ADSS)**

After these steps, the ADSS will be ready to either be fed through the reduction ferrule or directly through the closure base.

Step 1. Using a hacksaw, cut back 2.5m of the ADSS outer sheath taking care not to cut or damage the inner sheath.

Step 2. The Kevlar yarn will be exposed. Arrange the yarn to one side at the end of the ADSS to expose the inner sheath.

Step 3. If the OD of the inner sheath is below 10mm, proceed to 3.4 below. Otherwise proceed to 3.5 below. (See Figure 4)

### **3.4. Keeper Configuration**

After these steps, the OPGW/ADSS will be safely secured on the keeper and fibres through the base of the closure.

Step 1. Feed the OPGW/ADSS-Ferrule combination through a +/-10mm section of the supplied heat shrink tube.

Step 2. Position the heat shrink such that it covers the Ferrule and OPGW/ADSS joint. Apply heat uniformly around the joint. Ensure that heat is evenly distributed to prevent the heat shrink tube from burning or bubbling.

Step 3. Feed the OPGW/ADSS-Ferrule combination through the desired entry point of the closure's base. Optical fibres first.

Step 4. Cut the Central Tube/ Inner Sheath to be approx. 20mm from the edge of the ferrule. (See Figure 4)

Step 5. If OPGW, position the OPGW on the closure keeper and using a calibrated torque wrench, tighten the keeper bolts to the recommended 25Nm.

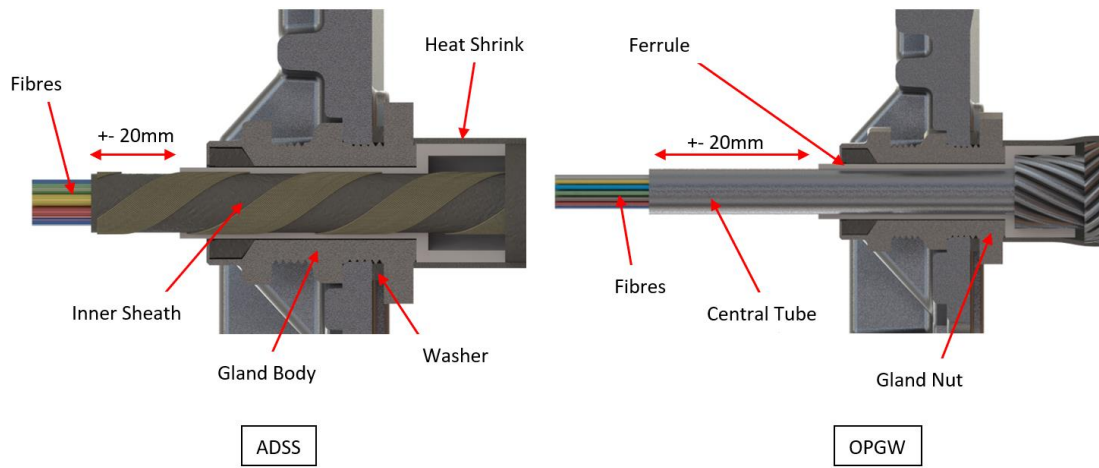
Step 6. If ADSS, position the ADSS on the closure keeper and secure the ADSS in the keeper by hand-tightening the keeper bolts until the ADSS is secured.

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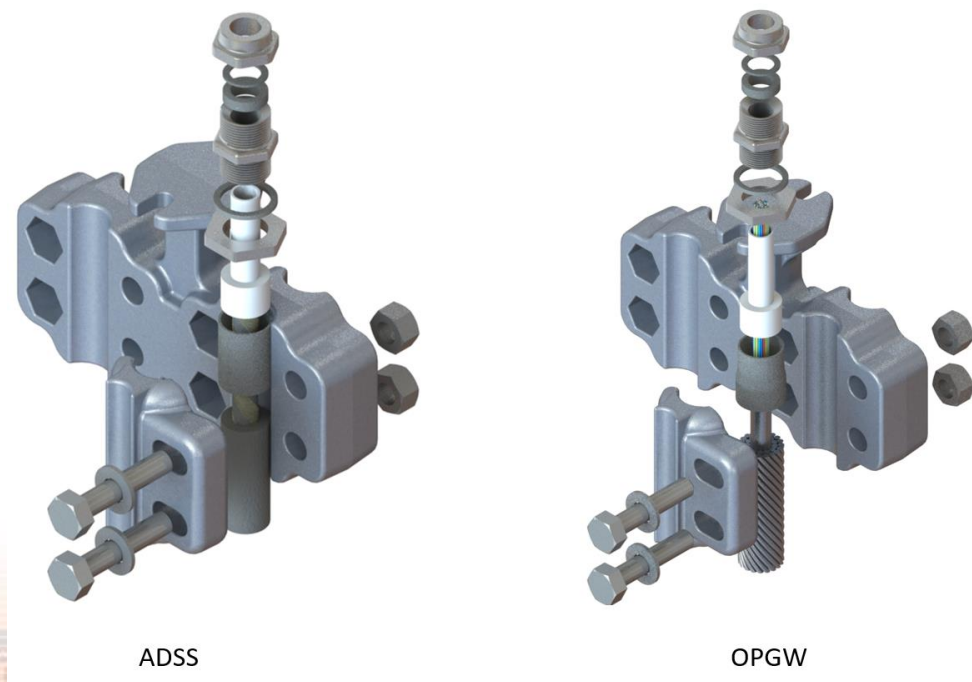
Step 7. Fibres not protected by buffer tube should have transportation tube placed over them from the leading tip of the central tube until the fan out tray. Felt strips and cable ties should be used to fix the transportation tube to the inlet of the tray. See Chapter 4 for routing instructions.

Step 8. For 16-23mm Diameter capability use primary side of the keeper, otherwise for 8-16mm Diameters, flip the keeper to its opposite side. (See Figure 6)

*Tip: To further improve waterproof performance, cover all open orifice surroundings with a good quality silicone grease (provided) before sealing.*



*Figure 4 Reduction Ferrule Use*



*Figure 5 Clamped Assembly*

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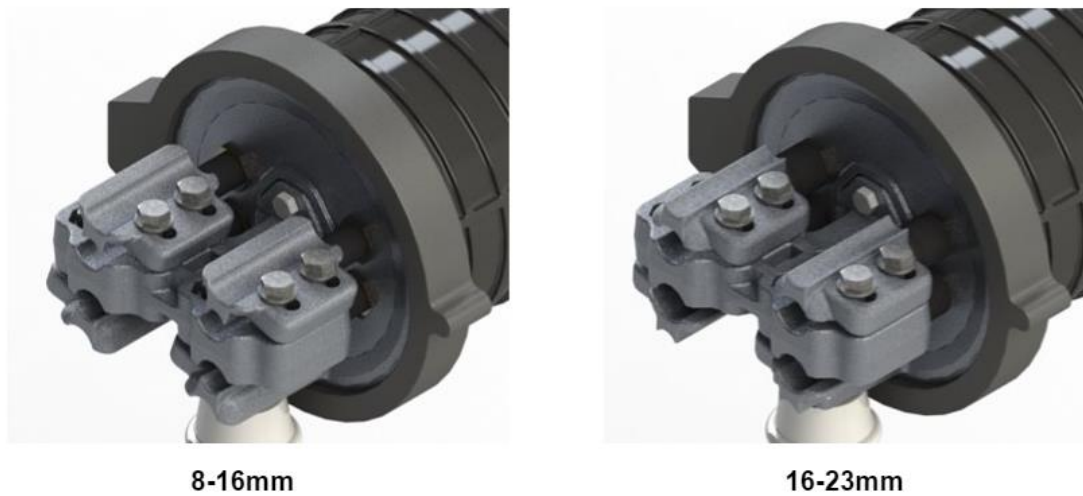


Figure 6

### 3.5. Direct feed method (OPGW and ADSS)

This method is used for all OPGW and ADSS that are too big for the reduction ferrule.

Step 1. For OPGW with a central tube, if the central tube OD is greater than 10mm, feed the OPGW directly through the desired entry point of the closure's base. Optical fibres first and, using a calibrated torque wrench, tighten the keeper bolts to the recommended 25Nm.

Step 2. If the ADSS inner sheath OD is greater than 10mm, then feed the ADSS directly through the desired entry point of the closure's base, optical fibres first. Hand-tighten the keeper bolts until ADSS is secured on closure keeper.

Step 3. Cut the Central Tube/ Inner Sheath to be approx. 20mm from the edge of the ferrule. (See Figure 4)

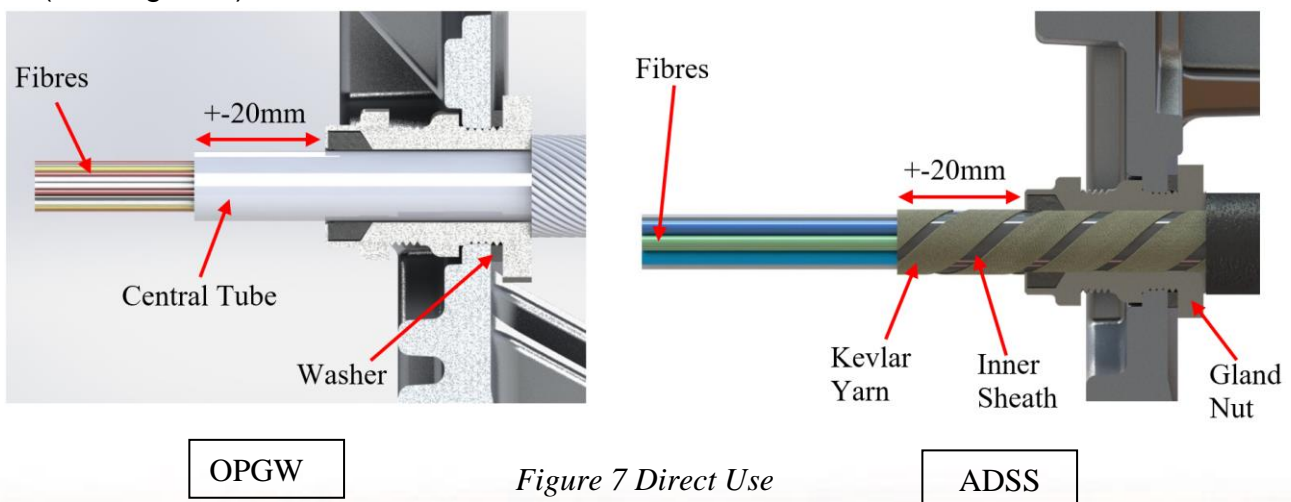
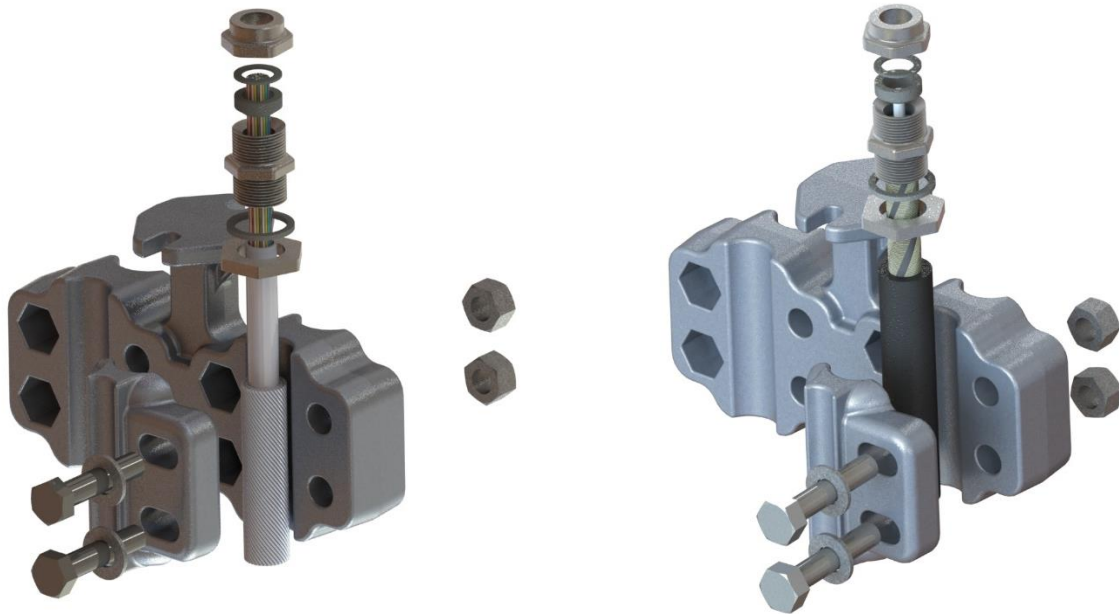


Figure 7 Direct Use

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*Figure 8 Clamped Assembly*

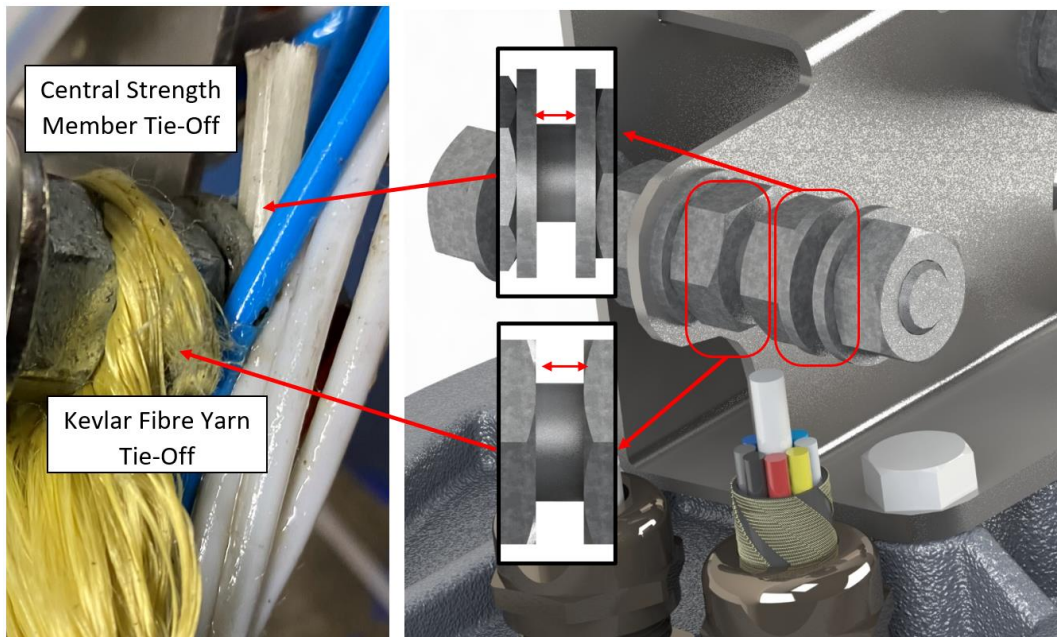
### **3.6. ADSS Tie Off (ADSS)**

These instructions are necessary to protect the ADSS from being tempered with.

Step 1. The flexible Kevlar fibre yarn should be braided before clamping to the strength bracket. The nut closest to the bracket is to be positioned flush with the bracket. The braided yarn is then to be tied in a knot around the stud and the adjacent middle nut should be used to control the clamping force on the yarn. Tighten the nut until confident that the yarn cannot be removed by pulling. (See Figure 9)

Step 2. Using the correct cutting tool, size the central strength member such that it can be clamped between the middle and last washer. Once cut, position the member in between the washers and only move the third nut to control the clamping force on the yarn. Tighten the nut until confident that the member cannot be removed by pushing or pulling. (See Figure 9)

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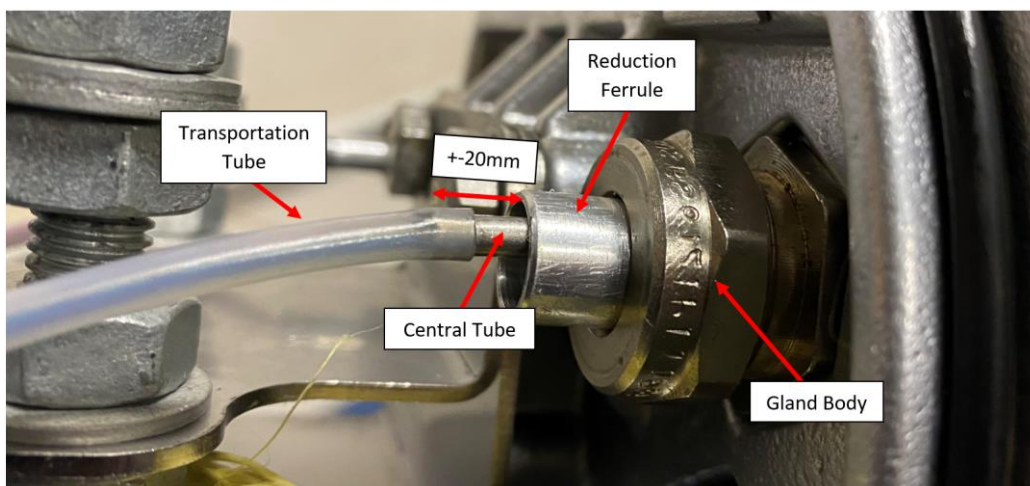


*Figure 9 Kevlar Yarn and Strength Member Tie-Off's*

#### **4. Internal Routing**

**4.1.** Bare fibre OPGW/ADSS should be protected from damage by using transportation tubes:

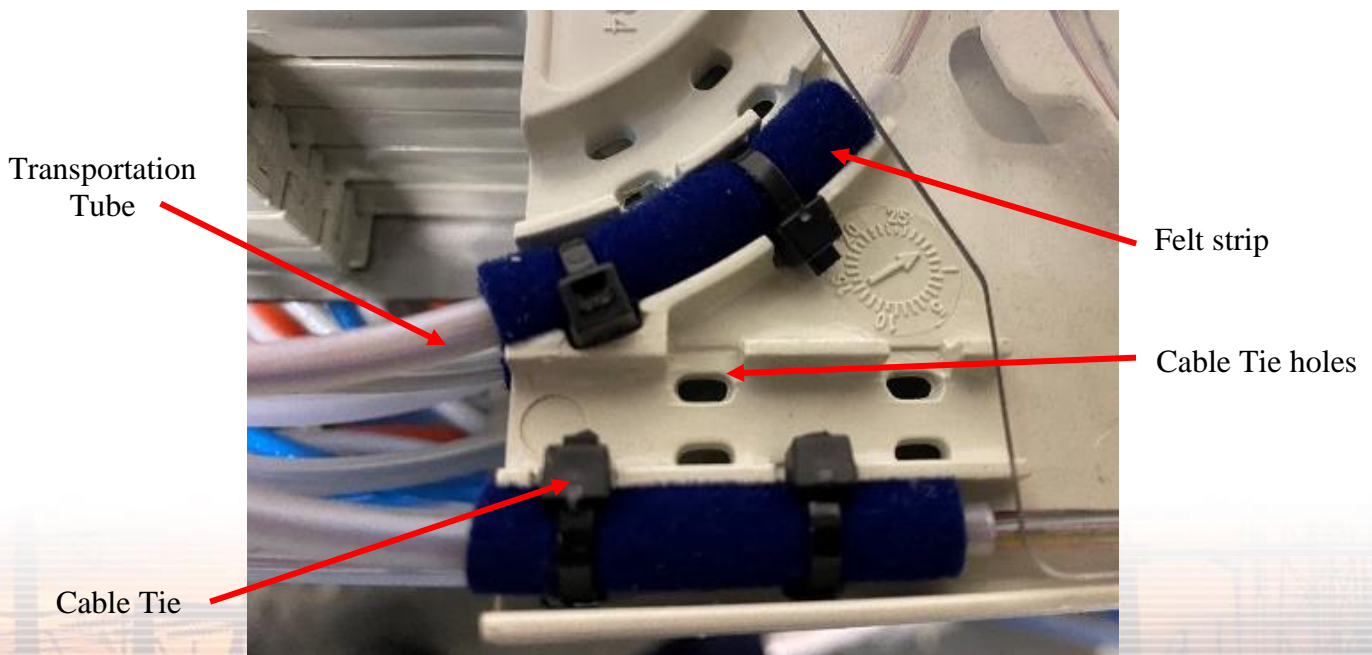
- Step 1. Fit the transportation tube over the central tube/ Stranded optical wire. (See Figure 10)
- Step 2. Route the transportation tube to the fan-out tray.



*Figure 10*

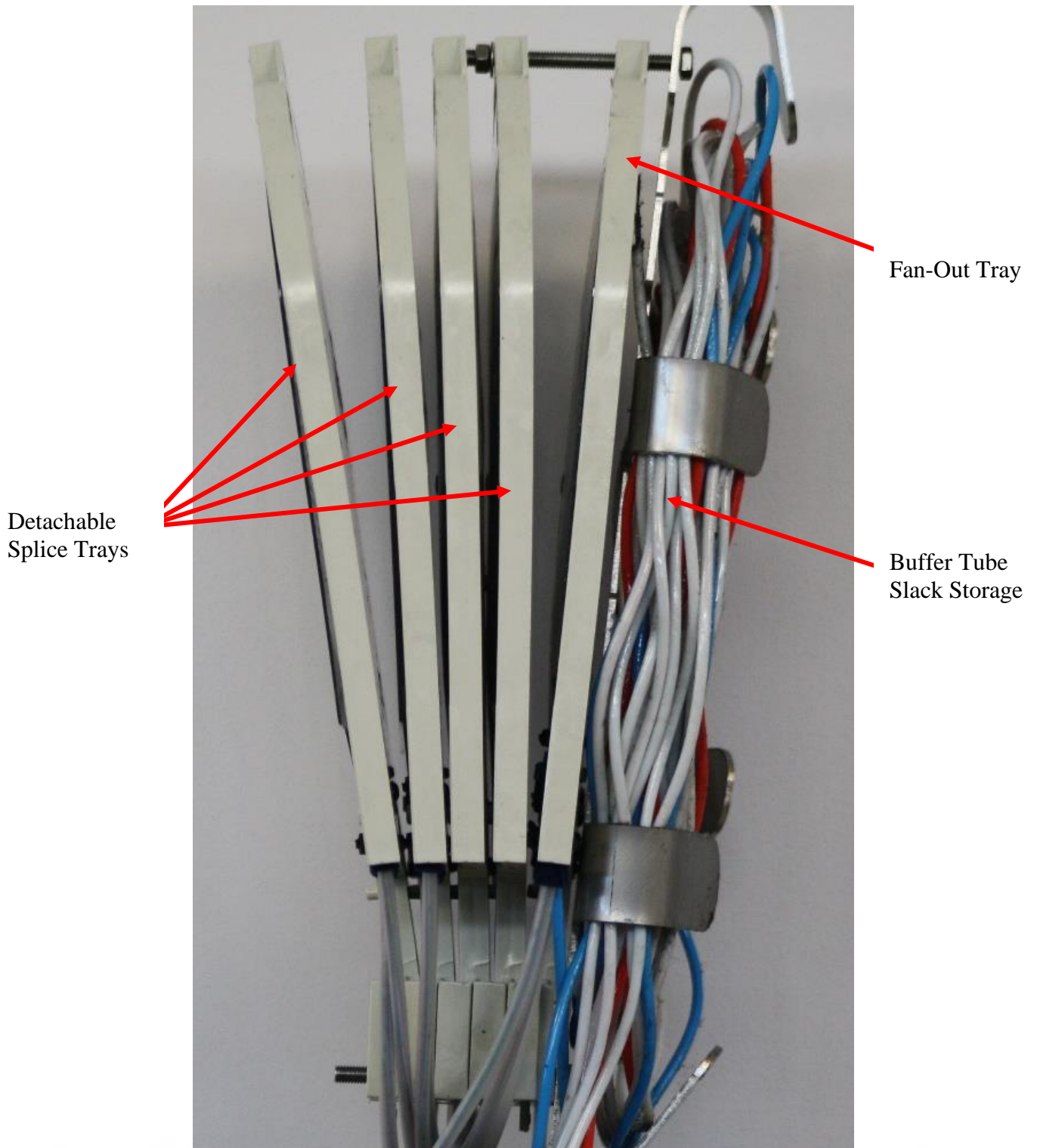
**4.2.** OPGW/ADSS with optical fibres protected by buffer tubes should have the slack stored in the Slack Storage Bracket where the fibres required for splicing can be extracted and routed to the fan-out tray. (See Figure 12)

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- 4.3. The fan out tray is the rearmost tray which has no splice grooves. This tray has allows the fibres to expand and contract independently. The splice trays can be unclipped and removed to improve access. (See Figure 13)
- 4.4. The fan-out tray has 8 ports which can be used for feeding or dropping. Each port has holes which are used for strapping the cable ties to the transportations/buffer tube.
- 4.5. Once the fibres have been placed into the fan-out tray, dropping to various splice tray can be done:
- Step 1. Split the fibres into suitable quantities (up to 24 fibres per splice tray).
  - Step 2. Cut the suitable length of transportation tube and feed the fibres through it.  
(Ensure fibres are covered from the drop port to the feed port)
  - Step 3. Guide the fibres from the fan-out tray to their required splice tray.
  - Step 4. Ensure the routing convention in Figure 14 for feeding and dropping is followed.
  - Step 5. Secure the transportation/buffer tube by strapping it down with the cable tie at the drop port and the feed port. (See Figure 11)
- 4.6. The length of transportation tubes that will be strapped down should be wrapped in felt strips.
- 4.7. With the required fibres on the splice tray, splice the fibres as per recommended practice, using the provided splice protectors.
- 4.8. Place the spliced fibres in the splice protector into the splice grooves on the splice tray.



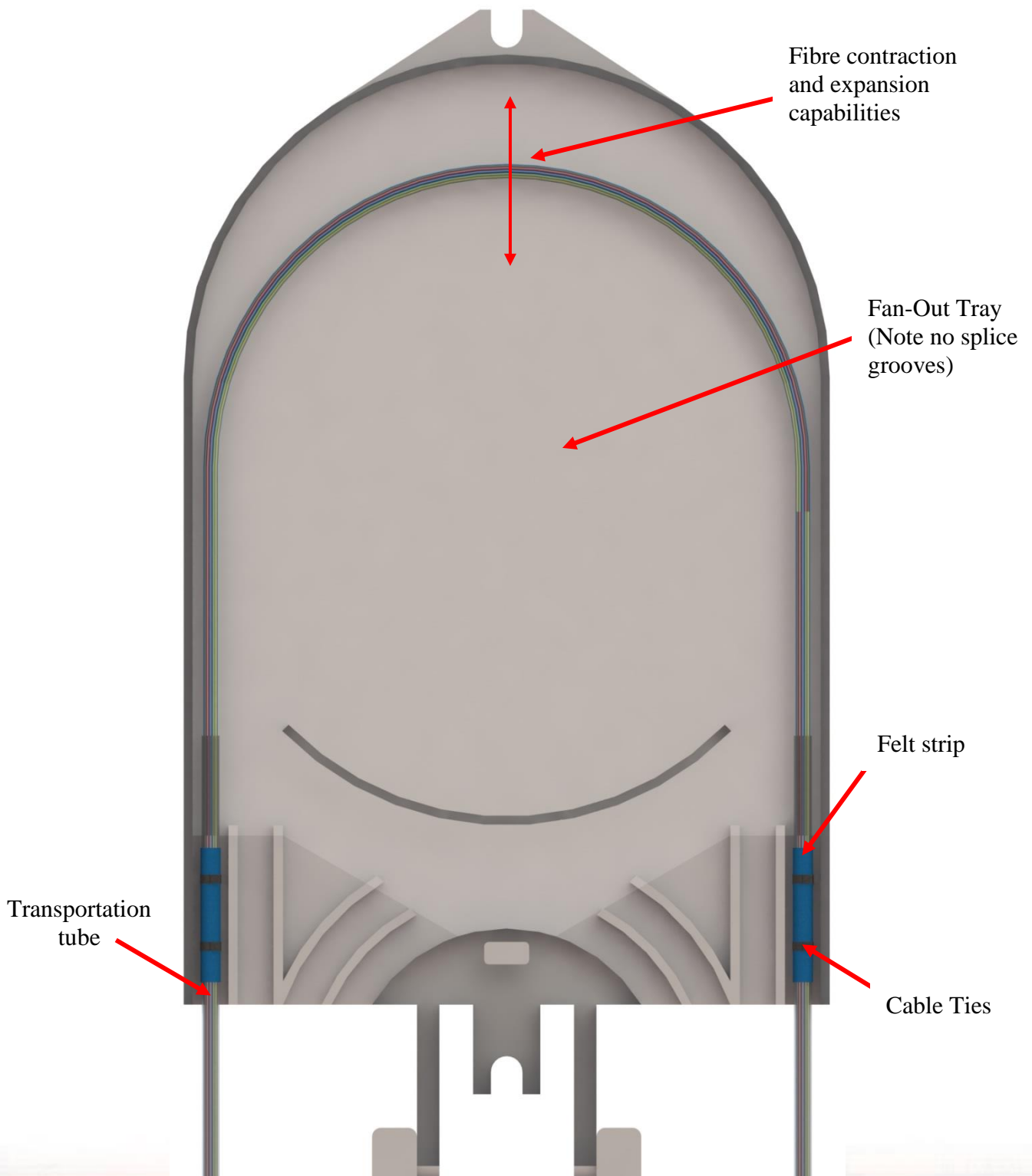
*Figure 11 Transportation Tube strapped down to tray*

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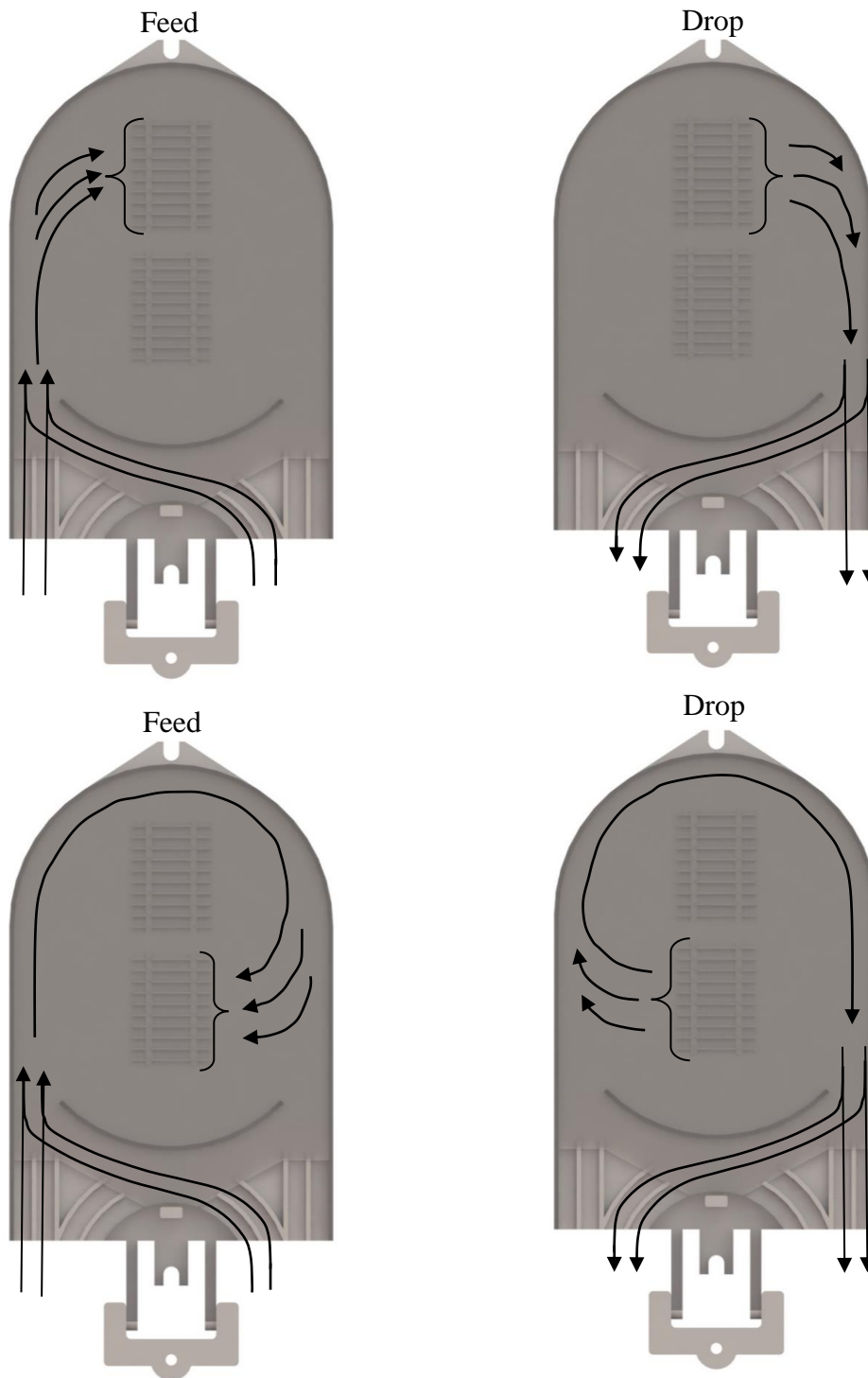
*Figure 12*

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*Figure 13*

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*Figure 14*

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## 5. Finalising

5.1. Once all splicing is complete, the trays should be secured in place by tightening the top bolt and nut attached to the top of the Slack Storage Bracket over all the trays. (See Figure 15)

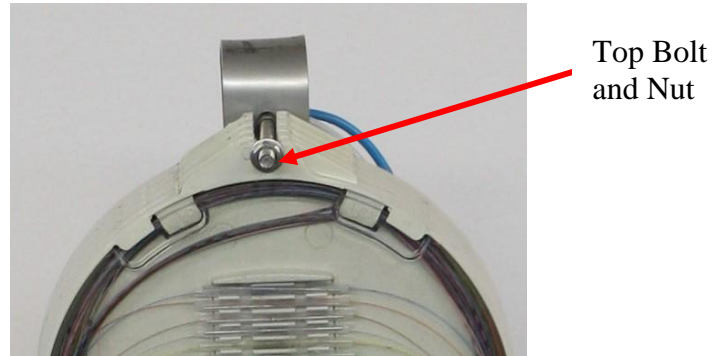


Figure 15

5.2. The dome is to be carefully placed over the completed assembly and fixed in place by ensuring the lock mechanism is engaged. (See Figure 16)

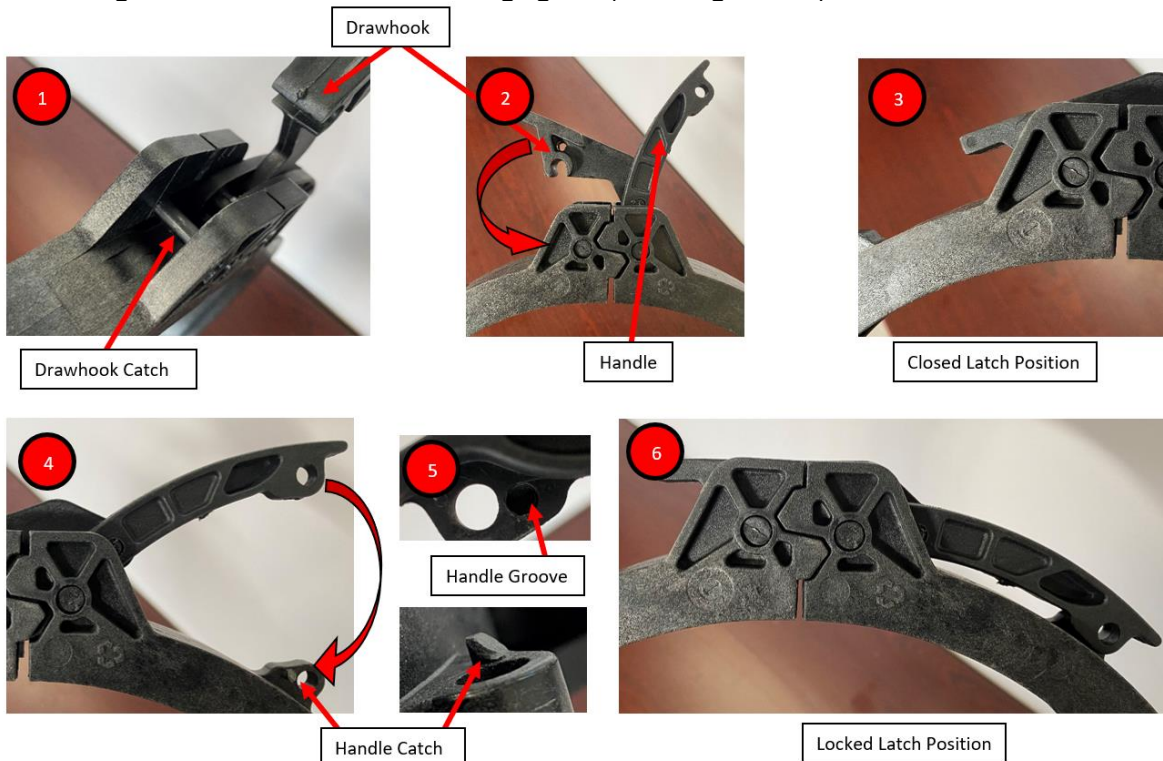


Figure 16 Collar locking mechanism

5.3. Where the closure is supplied with an insulator, a single insulator and DCH mounting bracket are to be used between the closure base and the tower clamp. (See Figure 17)

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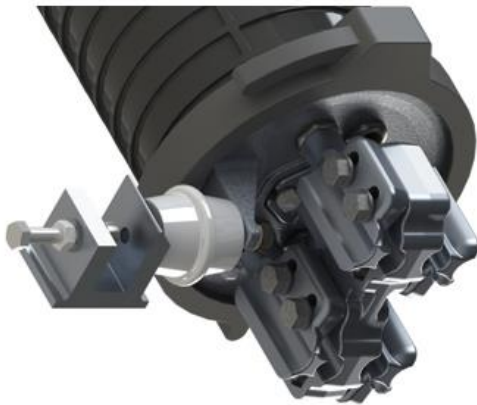


**Insulated attachment**



**Non-insulated attachment**

**Downlead Clamp Attachment**

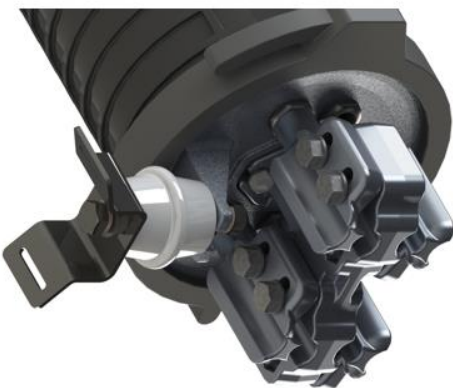


**Insulated attachment**



**Non-insulated attachment**

**Alternate Downlead Clamp Attachment**



**Insulated attachment**



**Non-insulated attachment**

**Monopole Mounting Bracket Attachment**

*Figure 17*

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### **SAFETY CONSIDERATIONS**

1. This application procedure is not intended to supersede any company construction or safety standards. This procedure is offered only to illustrate safe application for the individual. Failure to follow these procedures may result in personal injury.
2. When working in the area of energized lines, extra care should be taken to prevent accidental electrical contact.
3. For proper performance and personal safety, be sure to select the proper size PREFORMED™ product before application.
4. This product is intended for use by trained craftspeople only. This product **should not be used** by anyone who is not familiar with, and not trained to use it.