INSTALLATION GUIDE

Installation of Fujikura 432f high-capacity SpiderWeb Ribbon® optical fibre cable.

This guide details the Network Rail-specific installation requirements to build a spliced and mid-access (spliceless) joint.

Scan for Fujikura Network Rail support

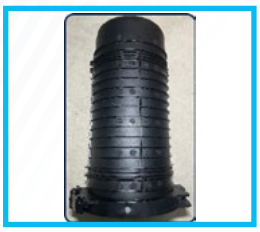
CERTIFICATION OF ACCEPTANCE
PAO5/07895

DOCUMENT VERSION
NR1

DATE OF LAST UPDATE
27/06/25

Please use these instructions in addition to the Apex installation guide.

1
REQUIRED PARTS: AX-2S-B-L-6-4-0-X-NR



[a]
Apex closure X-2 or X-2s

[b]
Cable attachment unit (1 x per cable)

[c]
Crown bracket with 6x M6 bcrews

[d]
Hose clamp (1 x per cable)

[e]
Spur bracket (1 x per cable)

2
CROWN BRACKET INSTALLATION

Before the cables can be installed into the Apex the crown bracket must be attached to the base.

1.
Remove the 6 bolts 3/8" from the Apex base [figure 1].

2.
Position the crown bracket (no orientation) with the screw holes in the Apex base.

3.
Install the crown bracket using the supplied 6 M6 screws [figure 2].

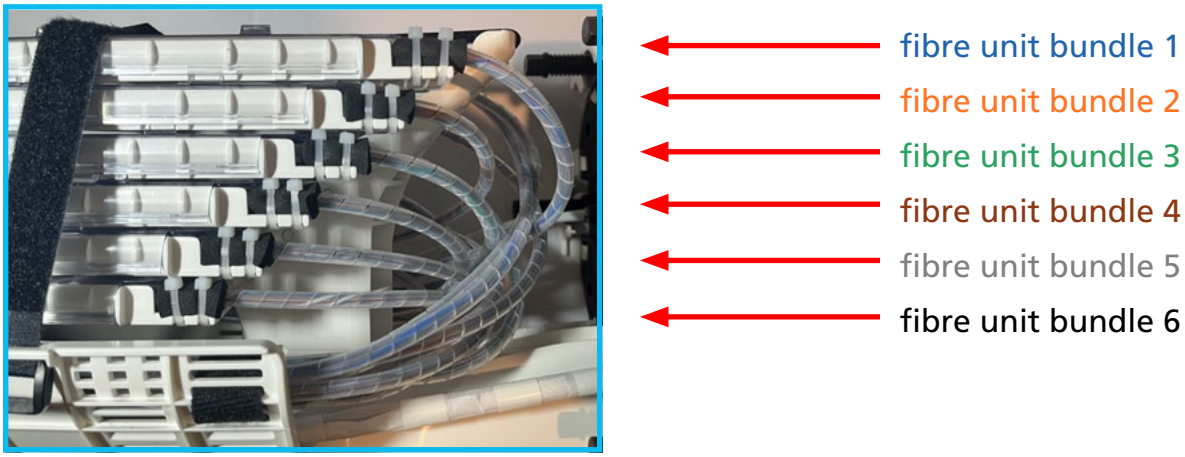
4.
Tighten to 1.12Nm (10in/lb).

[Figure 1]

[Figure 2]

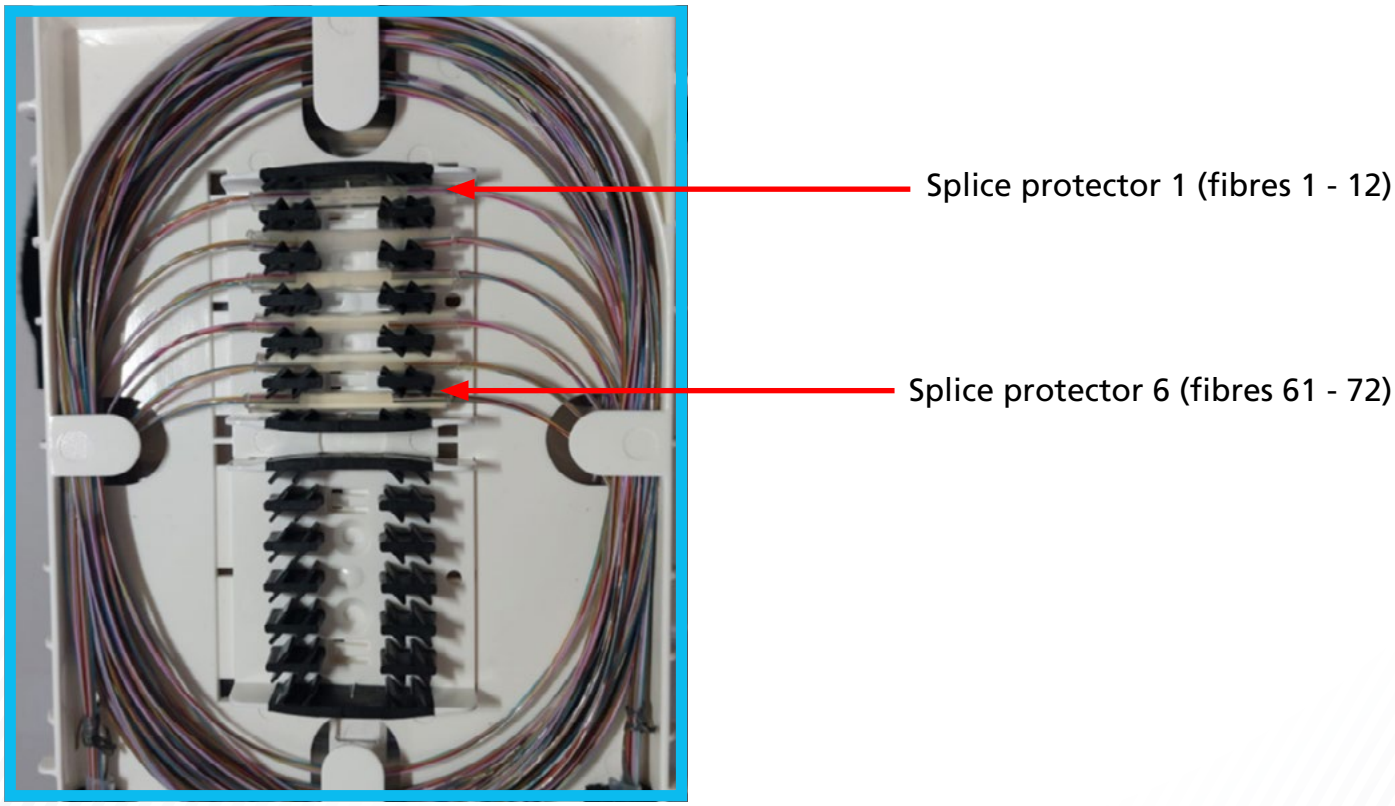
3
SPLICE TRAY ALLOCATION

Each splice tray is allocated 1 unit bundle (72f) from the cable. Build the enclosure starting with the last unit bundle (unit 6 - white), using the lowest splice tray position [figure 3].



[Figure 3]

Each splice tray holds 6 ribbon splice protectors; only the top 6 are used for 432f cables. Position the splice protectors starting with ribbon 1 at the top [figure 4].



[Figure 4]

4
CABLE PREPARATION
432f/48f steel tape armour cable

Cable cut lengths

Joint type	Apex	Cut length
Mid-access joint	X-2	4.4m (2.2m in each direction)
Mid-access joint	X-2s	4.2m (2.1m in each direction)
Butt joint	X-2	2.5m
Butt joint	X-2s	2.5m

Table 1

1.
Markup the cable at the length detailed in table 1 and remove the outer sheath and steel tape armour [figure 5].

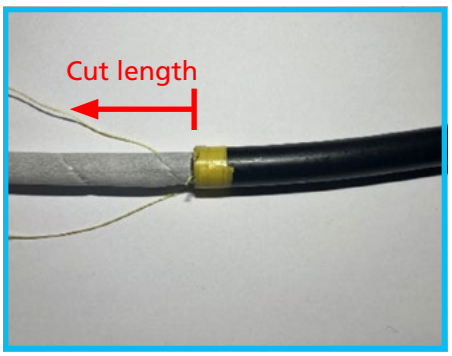


Figure 5

2.
Remove the water blocking tape and mark the inner sheath at 80mm from the ring cut [figure 6].

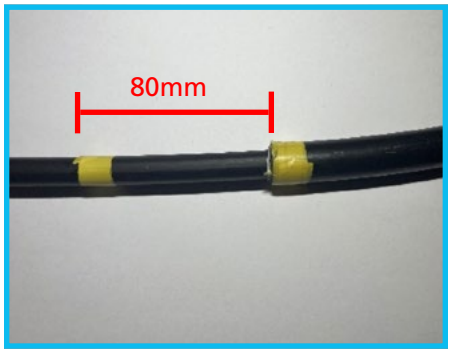


Figure 6

3.
Remove the inner sheath to the mark. Cut back the water blocking tape, leaving 220mm from the ring cut. Loosely secure the water blocking tape over the fibres using electrical tape [figure 7].

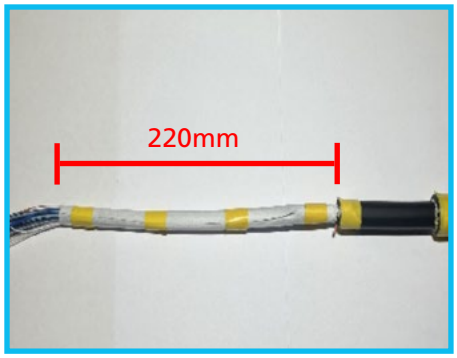


Figure 7

5
CABLE ATTACHMENT UNIT CAU
CAU preparation and cable attachment

1.
Each cable port in the enclosure requires 1 CAU.

2.
Snap off the top section of the CAU. The top section is not required when installing Fujikura SWR ribbon cables [figure 8].

3.
When installing and cable with an inner sheath diameter less than 14mm (0.55”), install the supplied white spacer as shown. 432f and 48f will require the spacer [figure 9].

4.
Install the cable into the CAU using the supplied hose clamp and spur bracket [figure 10]. Ensure there is 20mm of cable sheath above the hose clamp. Tighten the hose clamp to 3.4nm which is about the maximum you can get using a nut driver hand tool.

5.
The spur bracket must be positioned at the top of the cable [figure 11].

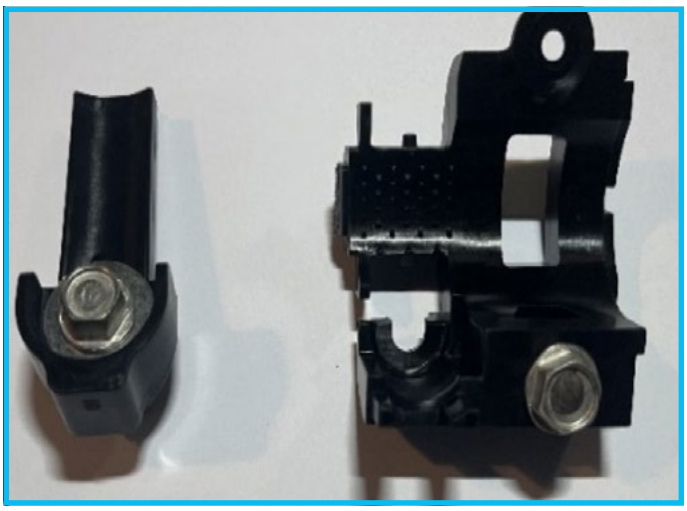


Figure 8

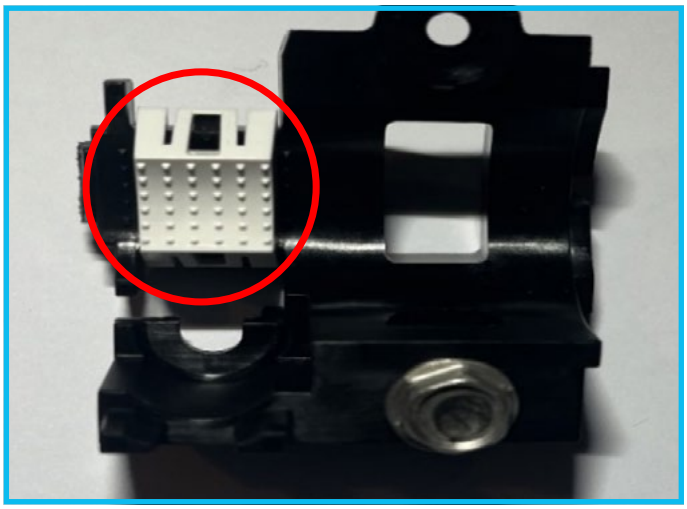


Figure 9

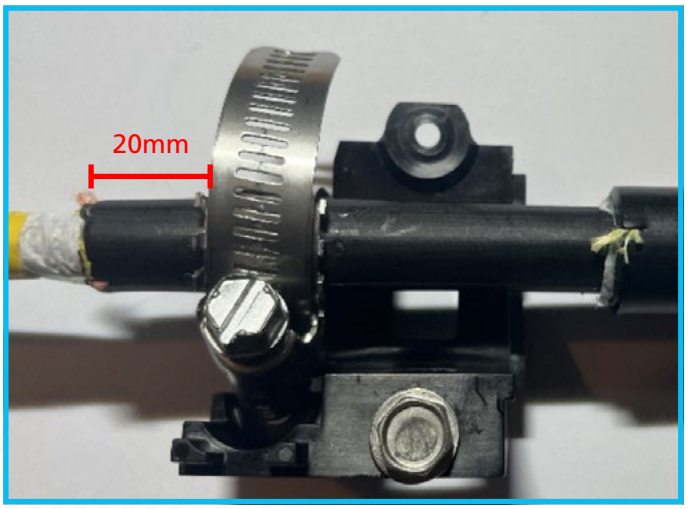


Figure 10

Figure 11

6
PORT ALLOCATION
Cable port identification 432f/48f

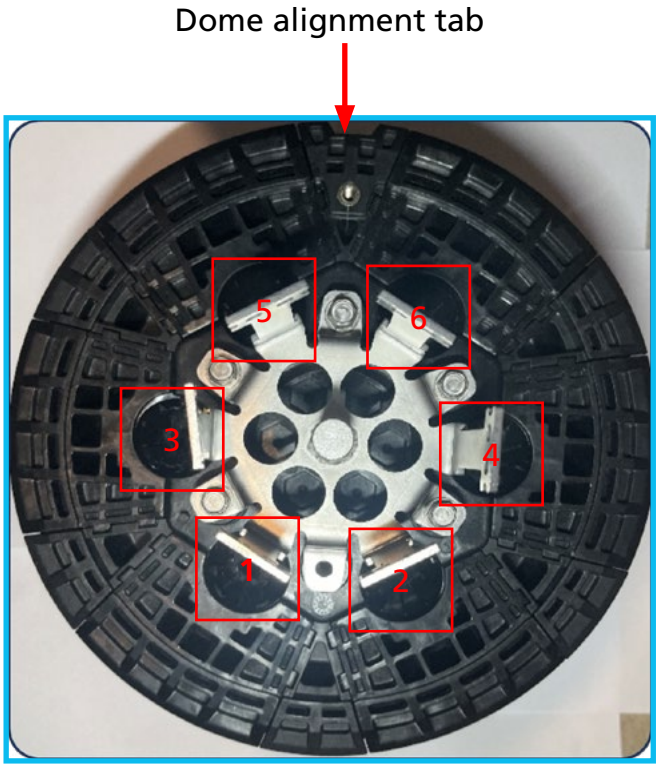
Apex	Port number	Cable
X-2, X-2S	1	432f IN (West)
X-2, X-2S	2	432f OUT (East)
X-2, X-2S	3	48f (Spur)
X-2, X-2S	4	48f (Spur)

Table 2

1.
To ensure direct access to the slack basket ports 1 and 2 should be used for the 432f cable entry and exit [table 2].

2.
For additional spur cables use ports 3 and 4.

3.
To aid port identification, numbers are stamped on the base of the Apex [figure 12].



7

CAU INSTALLATION

Installing the CAU into the Apex

1.
Loosen sealing wedge compression screw and open the required Apex port by depressing the sealing wedge latch [figure 13].

2.
Ensure the removable gel pack is in position [figure 14].

3.
Lay the CAU with attached cable into the cable port on top of the gel pack. Ensure the CAU is fully engaged in the retaining slot [figure 14].

Figure 13

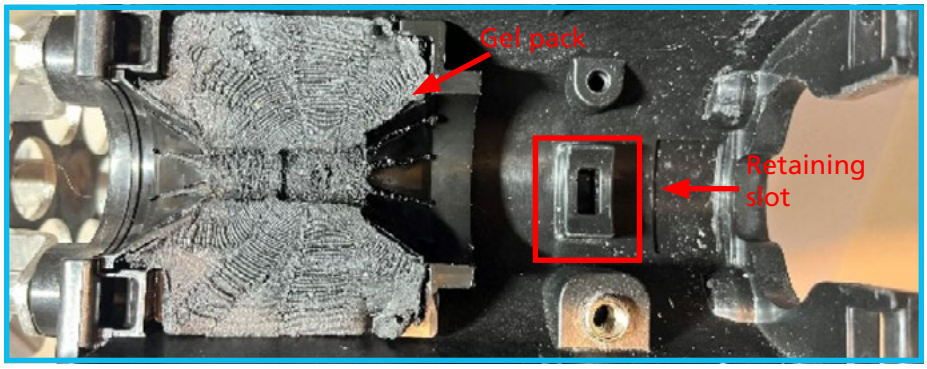


Figure 14

4.
Fully tighten the retaining screw [figure 15]. Ensure the outer jacket cut is positioned just above the removable gel pack, adjust the positioning if required.

5.
Secure the cable to the crown bracket using the supplied hose clamp and spur bracket [figure 16].

6.
Fully tighten the hose clamp, with the spur bracket at the top of the cable, until it is not possible to rotate the cable [figure 17].

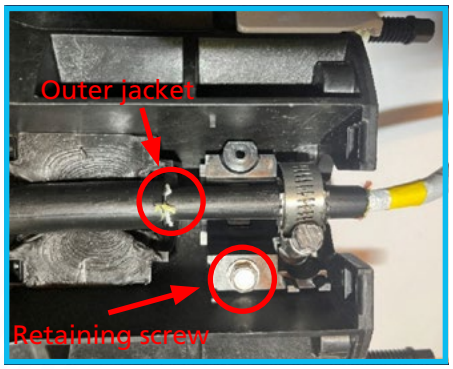


Figure 15

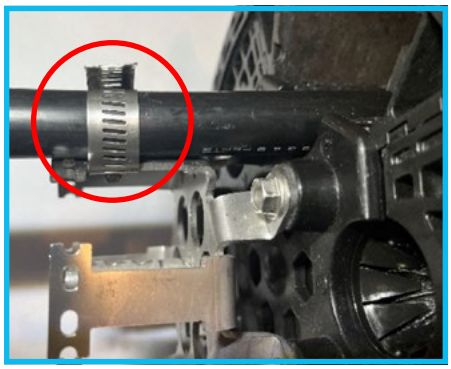


Figure 16

Figure 17

8
SEALING WEDGE INSTALLATION
Closing the cable port using the sealing wedge

1.
Compress the removable gel pack [figure 18].

Figure 18

2.
Fully loosen the sealing wedge compression screw and manually elongate the wedge gel block [figure 19].

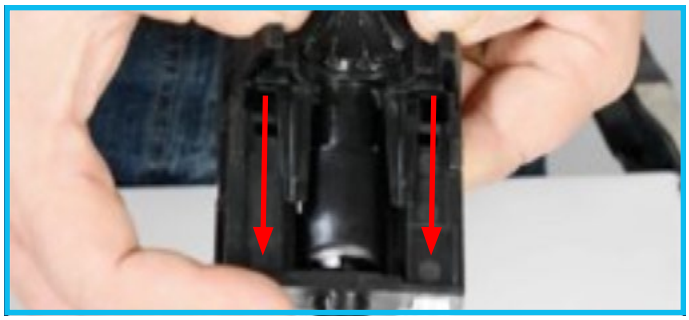


Figure 19

3.
Engage the sealing wedge into the slots on the Apex base [figure 20].

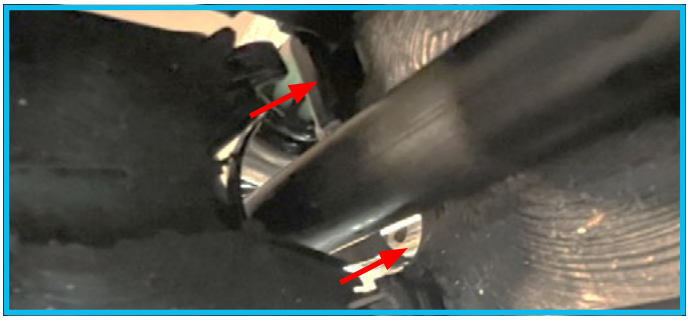


Figure 20

4.
Depress the sealing wedge latch and slide towards the base [figure 21].

Figure 21

5.
Push the sealing wedge down and release the latch to engage with the base.

6.
Fully tighten the sealing wedge compression screw [figure 22].

Figure 22

9

FIBRE ROUTING TO SPLICE TRAY (BUTT JOINT)

The exact same process is valid for the X-2 and X-2s enclosures (X-2s shown)

1.
Lay the water blocking tape section of the cable into the slack basket [figure 23].

2.
Cover the end of the water blocking tape with protective foam and secure it to the basket using two cable ties or Velcro, do not over tighten [figure 24].

3.
Loop the fibres to the opposite side of the slack basket [figure 25].

4.
Install 320mm of spiral wrap onto one unit bundle (72f). Position the spiral wrap at the slack basket tie point [figure 26].

5.
Secure the end of the spiral wrap using Velcro and cable ties. You can group three spiral wraps together in one Velcro. [figure 27].

6.
Route the spiral wrapped fibre to the first tray. Pass the fibres behind the splice tray spine as shown in figure 28. Secure to the splice tray using foam and two cable ties.

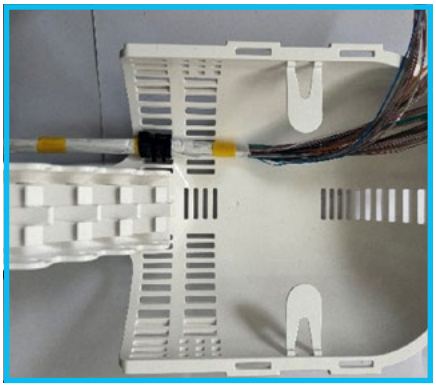


Figure 23

Figure 24

Figure 25

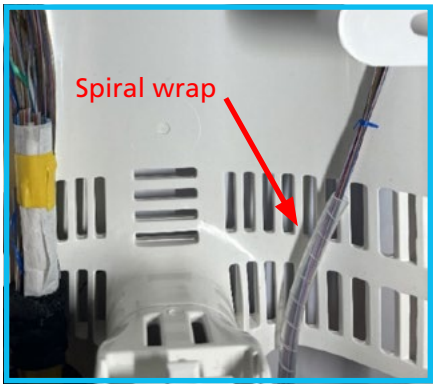


Figure 26

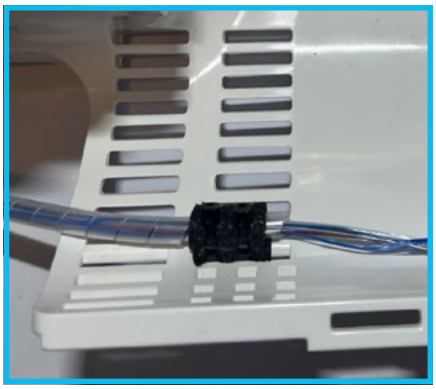


Figure 27

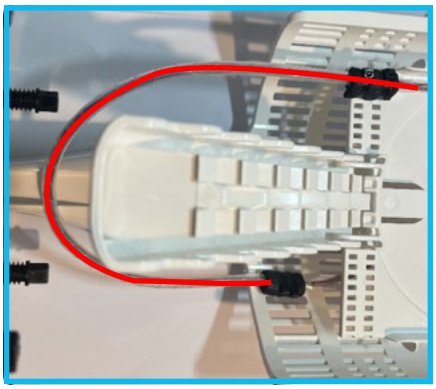


Figure 28

7.
Repeat the same process for the second 432f cable, route the unit bundle to the opposite side of the splice tray [figure 29].

8.
Continue the same process for each unit binder group in the cable. Each binder group is routed to a separate splice tray. 432f cable will require 6 splice trays [figure 30].

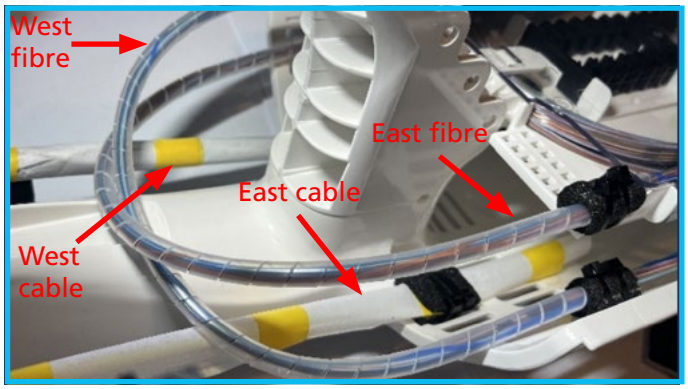


Figure 29

Figure 30

10
APEX X-2S SPLICE TRAY LAYOUT
432f routing in the splice tray

1.
Fibres entering the left-hand side of the tray should loop 3 times (>1m) and enter the left-hand side splice protector holders from the top position down [Figure 31].

2.
Fibres entering the right-hand side of the tray should loop 3 times (>1m) and enter the right-hand side splice protector holders from the top position down [Figure 32].

3.
The lower splice protector holders are reserved for spur cables. Once spliced all fibres should bend upwards into the splice protector holders.

4.
Once spliced the fibres should be positioned as shown in figure 33.

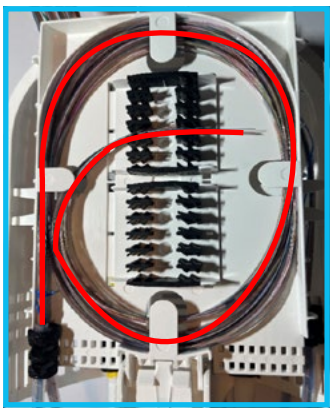


Figure 31

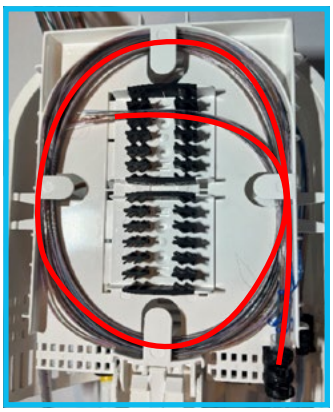


Figure 32

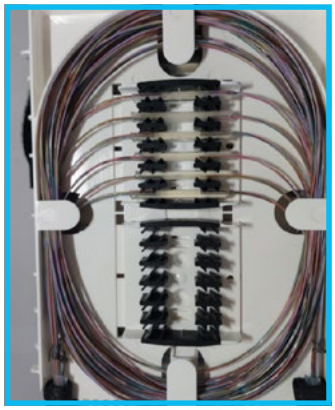


Figure 33

11

FIBRE ROUTING MID ACCESS JOINT

The exact same process is valid for the X-2 and X-2s enclosures

1.
Prepare the cable as detailed in section 3 and secure it to the basket using foam and cable ties [figure 34].

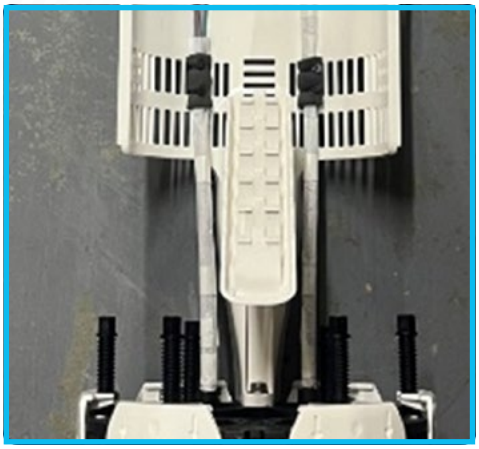


Figure 34

2.
Lay the fibres over the basket [Figure 35].

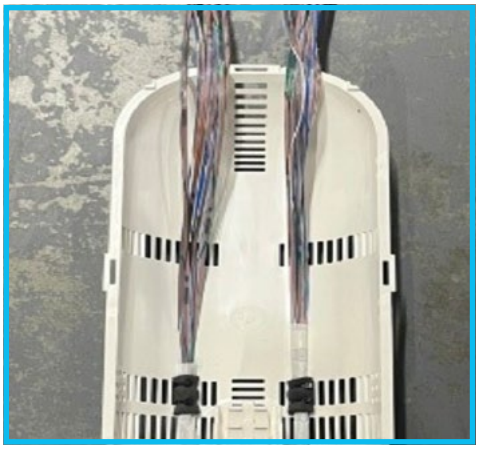


Figure 35

3.
Twist the fibres at the top of the basket to reverse the direction [figure 36].

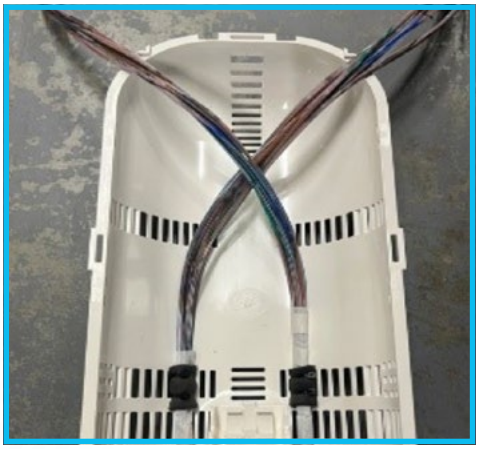


Figure 36

4.
Fold the fibres back into the basket and secure with Velcro. The fibres should exit the basket on the opposite side to the cable entry point [figure 37].

Figure 37

5.
Separate the first unit bundle on each side of the cable. Add 320mm of spiral wrap to each side of the fibre unit bundle [figure 38].

6.
Route the spiral wrapped fibre to the first tray. Pass the fibres behind the splice tray spine [figure 39].

7.
Secure the bundle to the splice tray using foam and cable ties.

8.
Route the fibre in the tray as shown in figure 40.

9.
Repeat for each unit bundle. Each binder group is routed to a separate splice tray. 432f cable will require 6 splice trays

10.
Once complete, secure the spiral wrap bundle at the basket using foam and tie wraps or Velcro.

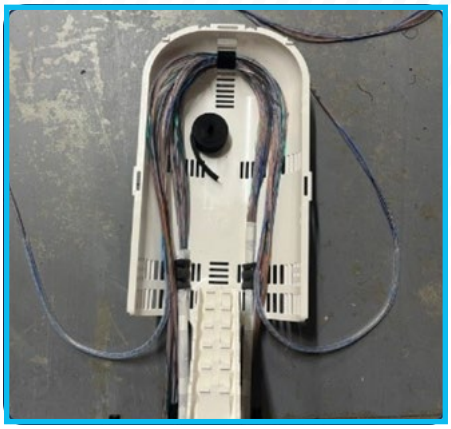


Figure 38

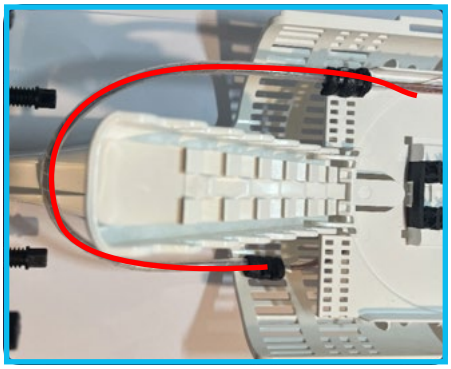


Figure 39

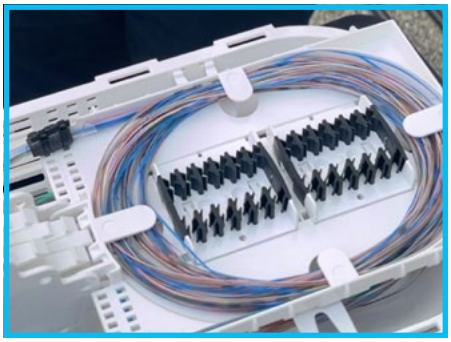


Figure 40

12
48F SPUR CABLE INSTALLATION

1.
48f spur cables are installed using the top splice tray only.

2.
Spur cables are installed using cable ports 3 and 4, see table 3 for port allocation.

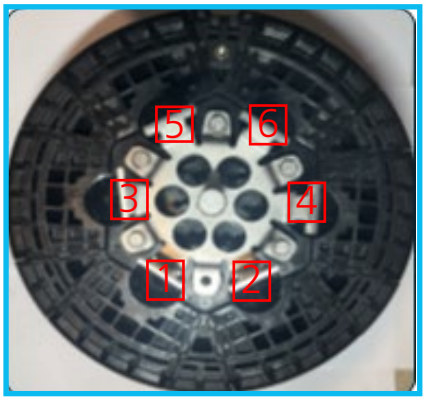


Figure 41

Spur type	Port 3	Port 4
Single (1 x 48f)	Not used	48f single spur
Dual (2 x 48f)	East spur 48f	West spur 48f

Table 3

14
SPUR CABLE INSTALLATION

Prepare the cable as described in section 4.

1.
Secure the fibres to the basket using foam and cable ties or velcro (figure 42).

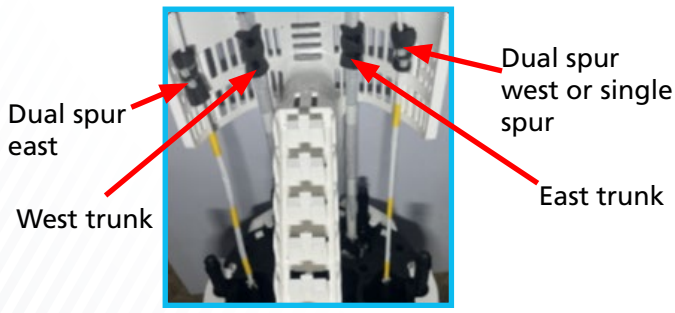


Figure 42

2.
Install 320mm of spiral wrap over the fibres and route to the top tray (6). Pass the fibres behind the splice tray spine (figure 43).

Figure 43

3.
Attach the fibre to the splice tray using foam and cable ties. figure 44 shows the single spur, figure 45 details the Dual Spur.

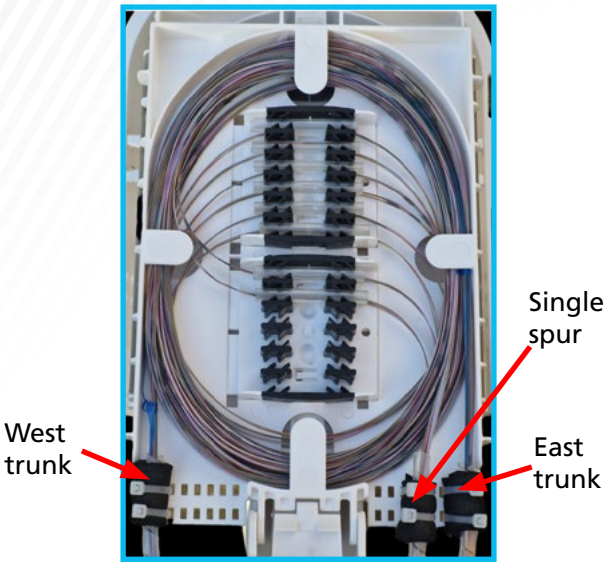


Figure 44 - Single spur

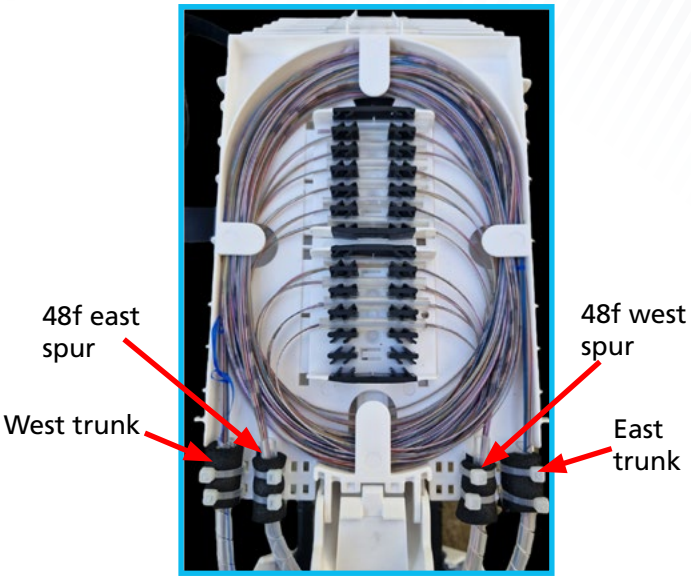


Figure 45 - Dual spur

4.
Loop the fibres in the splice tray to create a minimum of 1m of slack in each direction. Splice the single spur cable as detailed in figure 46.

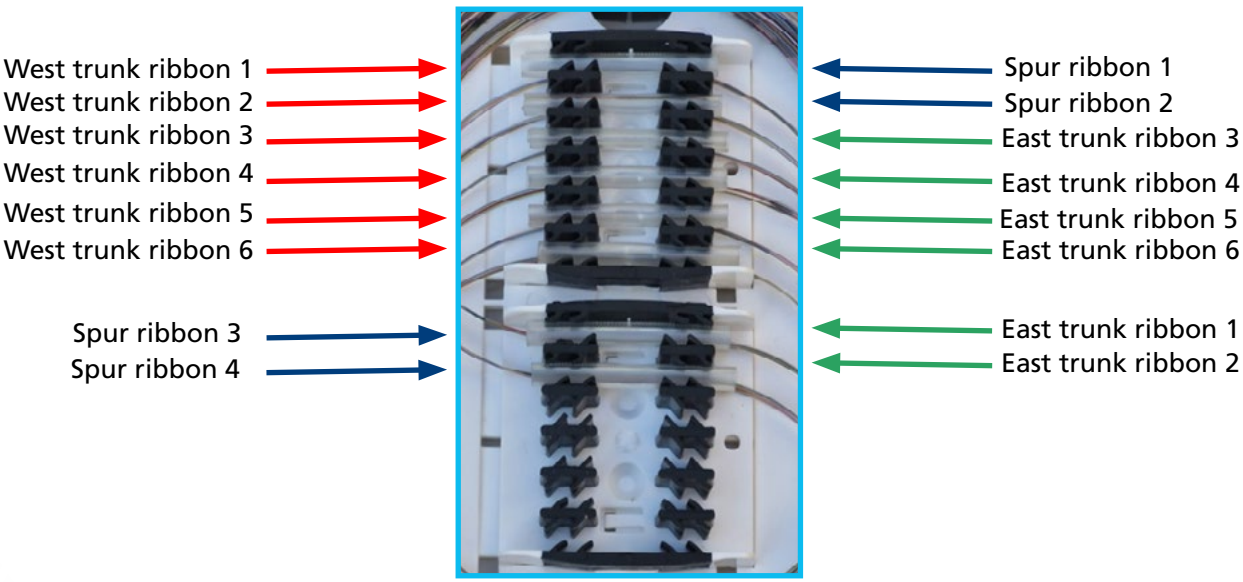


Figure 46 - Single spur

Splice the dual spur cable as detailed in figure 47.

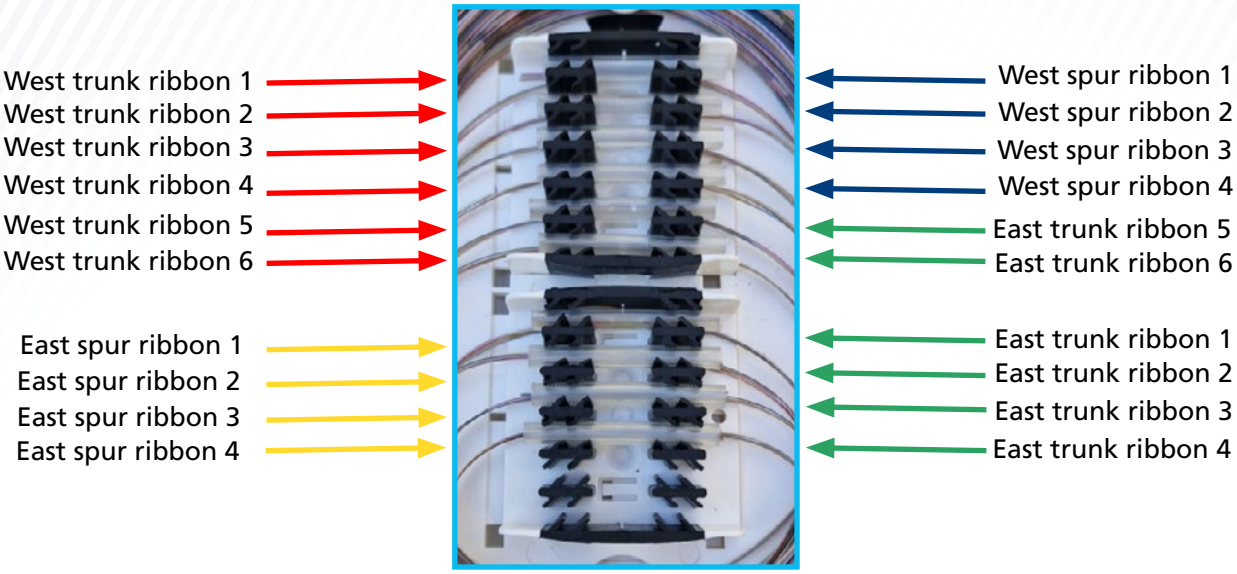


Figure 47 - Dual spur