Splicing, Testing, & Labeling

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Splicing & Testing Agenda:

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SP-02 - Acceptance Parameters
SP-03 - Fiber Management - Inside Enclosure
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    B.   Slack Basket
    C.   Fiber Management [Basket]
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    B.   M4A 350 Pedestal [Splitter Placement]
    C.   M4A 350 Pedestal [Conduit Labeling]
    D.   M4 Splitter Diagram / Fiber Management
    E.   M4 Splitter [Cable Entry]
    F.   M4 Splitter [Splice Tray]
    G.   M4 Splitter Closure [Vault]
    H.   Cabinet [Legacy Deployment]
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   B.   Network Overview
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LB-05 - Splice Point Locations & Enclosures
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LB-06 - Fiber Cabling Labels
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   E.   Fiber Cable Labeling [Pedestal Example]

Introduction
Section SP-01

SP-01 - Splicing & Testing Standards

Introduction

Various fiber testing methods should be used to determine the splicing quality, cable management, and the condition of the fiber itself. This guide covers the various testing methods, when these testing methods should be deployed, and the acceptance criteria in accordance with **Ripple Fibers Splicing and Testing Standards**. Additionally this guide will cover the **Splicing and Testing Deliverables** required for the close out process.
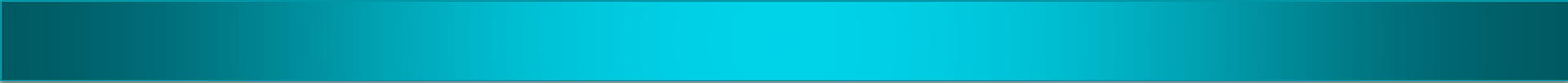
Acceptance Parameters
Section SP-02

SP-02 – Acceptance Parameters

SP-02 - Fiber Optic Splicing & Testing Acceptance Parameters

Acceptance parameters ensure Ripple Fiber's adherence to industry standards for fiber optic splicing and testing. These parameters establish quality criteria for maximum cable lengths, engineered loss thresholds, and performance reliability for XGS-PON networks.

Splicing & Installation Acceptance Criteria

- **Closure Assembly**
  - All closures must be properly sealed to prevent environmental ingress.
  - Correct grommets and sealing kits must be used.
  - No excessive slack inside the closure.
- **Cable Management**
  - Cables must be properly secured and dressed inside closures, splice trays, and panels.
  - No microbends, macrobends, or excessive coiling.
  - Proper slack storage with defined bend radius requirements.
- **Fiber Management**
  - No buffer tube violations; ensure proper stripping and routing.
  - Fibers neatly routed with sufficient slack in trays.
  - All fusion splices properly protected with heat-shrink sleeves.
  - No broken or exposed fibers inside closures.

Labeling & Documentation

- All cables and splice trays must be labeled according to network design and standards.
- Labels must be legible, durable, and placed at designated points.
- Accurate splice matrix documentation must be maintained.

Testing & Performance Criteria

- **Optical Time-Domain Reflectometer (OTDR) Testing**
  - Bi-directional OTDR testing must be performed at 1577nm.
  - Splice loss must not exceed 0.05 dB per splice.
  - Connectorized terminations must not exceed 0.30 dB per connection.
  - Trace analysis must confirm no excessive reflectance (-55 dB or better).
- **Power Meter Testing**
  - End-to-end loss must not exceed engineered design loss budgets.
  - Measured loss should align with OTDR loss measurements.
  - Testing must be conducted at 1577nm.

By adhering to these acceptance parameters, Ripple Fiber ensures the highest quality standards for fiber network performance, longevity, and reliability.

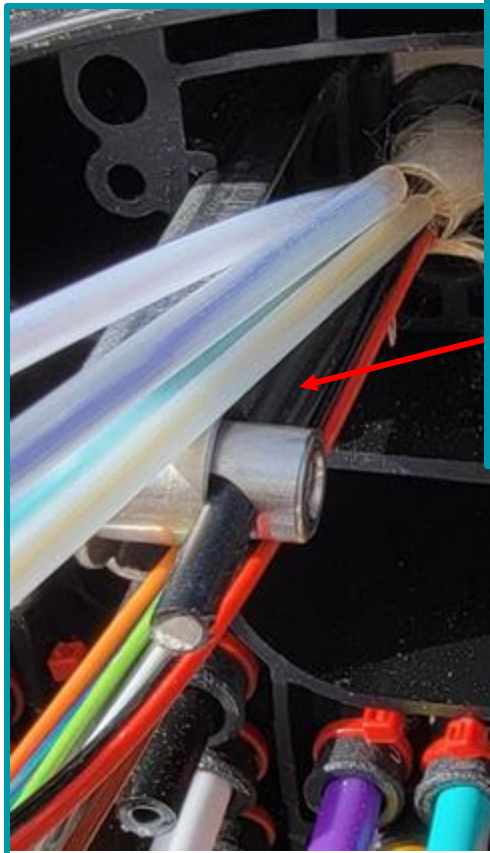# Fiber Management - Inside Enclosure
Section SP-03

SP-03.A - Closure Entry

SP-03.B - Slack Basket

SP-03.C - Fiber Management [Basket]

SP-03.D - Fiber Management [Tray]

SP-03.A - Closure Entry

| #	Cable Strength Member Attached To Closure Brackets	Error Codes
1	Ensure all cable strength members are secured to the manufacturer provided closure mounting brackets	EC-SP-03.A.1
2	Ensure unused access ports have plugs in place to prevent water from entering the closure	EC-SP-03.A.2
3	Conduits containing blown fiber MUST have a strain relief plug installed to aid in keeping water out of the conduit	EC-SP-03.A.3

SP-03.B - Slack Basket
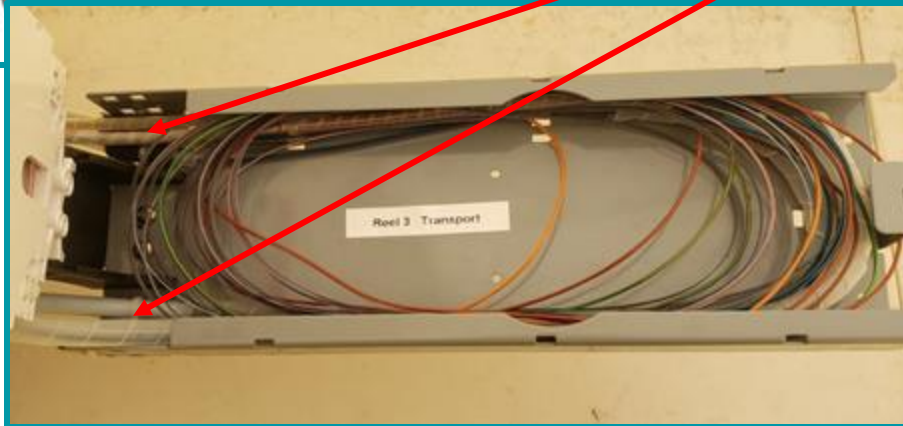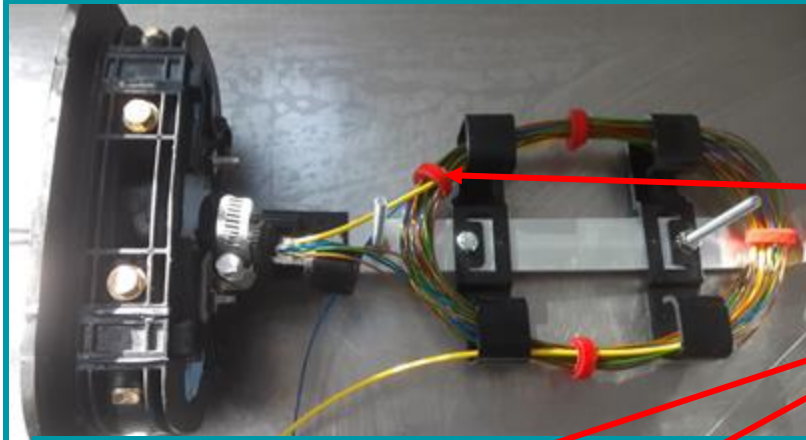
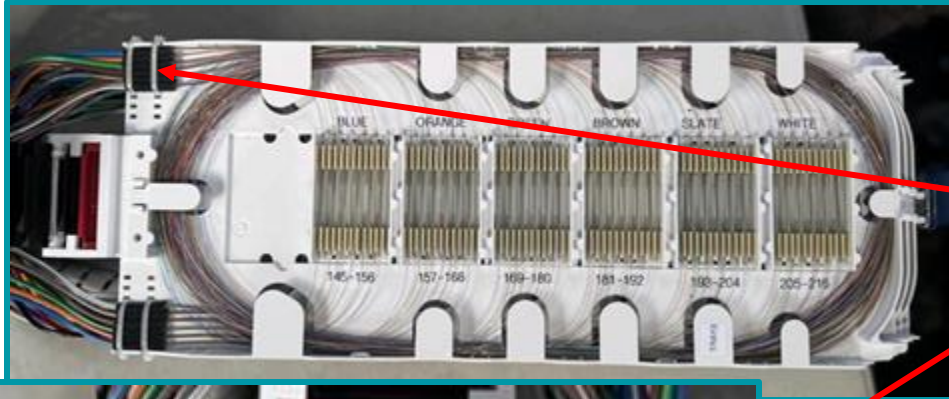| #	Securing the Buffer Tubes In the Basket	Error Codes
1	Ensure the buffer tubes that enter the basket are secured with Velcro	**EC-SP-03.B.1**
S	**What not to do:** Buffer & Transfer tubes are not secured in the basket with Velcro	**EC-SP-03.B.1**
	Note: Do not place zip-ties directly on a buffer tube or transfer tube without first applying felt	

SP-03.B - Slack Basket
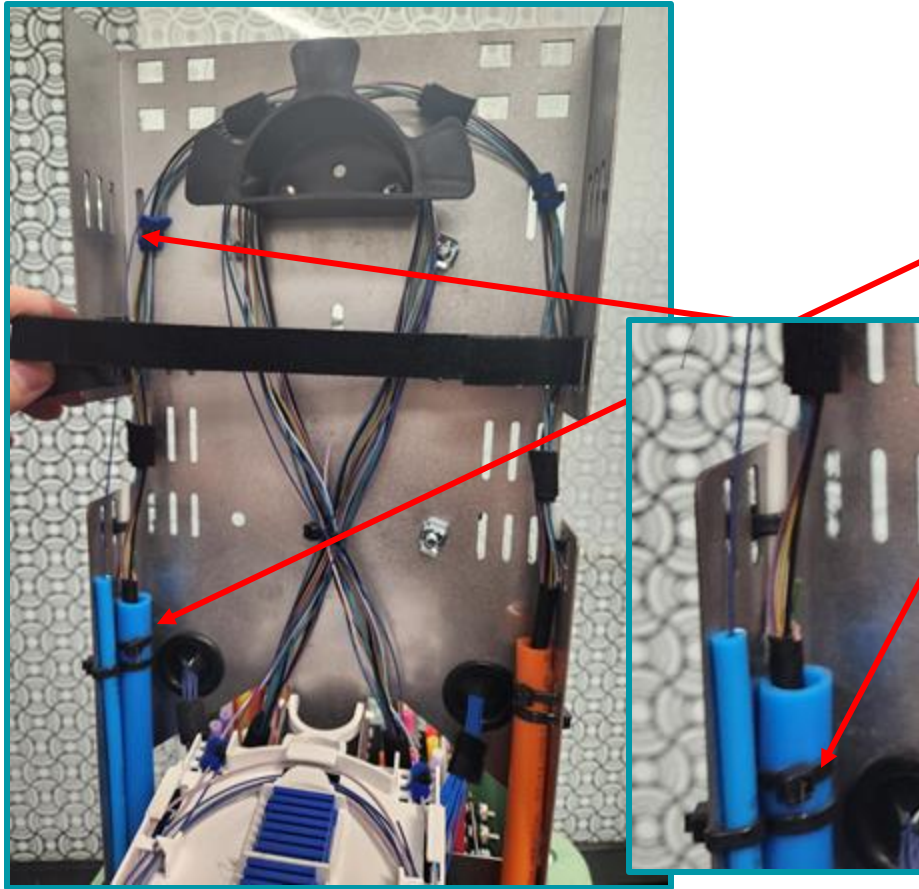
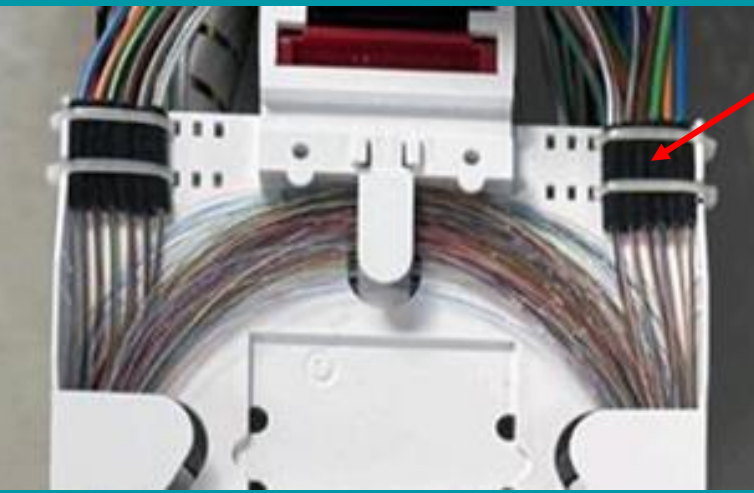| #	Securing the Buffer Tubes In the Pedestal	Error Codes
2	Buffer tubes should be routed from the left to the right (input to output) in a figure 8 format	EC-SP-03.B.2
3	Wrap the buffer tube slack in felt and zip-tie to the pedestal frame	EC-SP-03.B.3
4	Ensure the cable strength member is secured to the pedestal via zip-ties	EC-SP-03.B.4
BP	Spare trays should be stored on the outside while the feeder tray stored closest to the pedestal frame	

SP-03.C - Fiber Management [Basket]
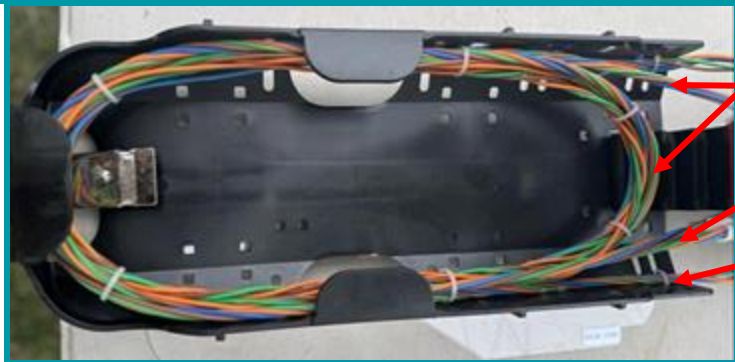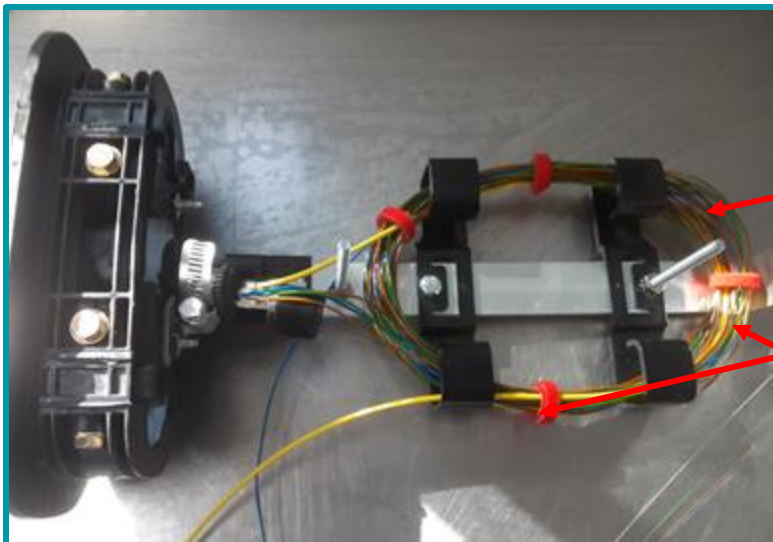
#	Buffer / Fiber Management In the Basket	Error Codes
1	Ensure there are between 2.5 or 3.5 wraps of buffer tube slack in the basket – under the splice tray(s) Note: Manufacturer specifications must be adhered	EC-SP-03.C.1
2	Ensure the buffer tubes are secured with felt and zip-ties *Note: Tape should not be considered suitable for securing buffer tubes into the splice tray.*	EC-SP-03.C.2
3	Ensure the buffer tubes are routed neatly, without kinks or hard bends, in the basket	EC-SP-03.C.3
S	**What not to do:** Ensure all buffer tubes that enter / exit the basket are secured with zip-ties	EC-SP-03.C.2
S	**What not to do:** Buffer tubes are missing felt	EC-SP-03.C.2

SP-03.D - Fiber Management [Tray]

#	Securing the Buffer Tubes In the Basket	Error Codes
1	Ensure the buffer & transition tubes have felt around them for protection from the zip-ties.	EC-SP-03.D.1
BP	**Note:** Install buffer tubes in such a way that it reflects the "fiber color code"	
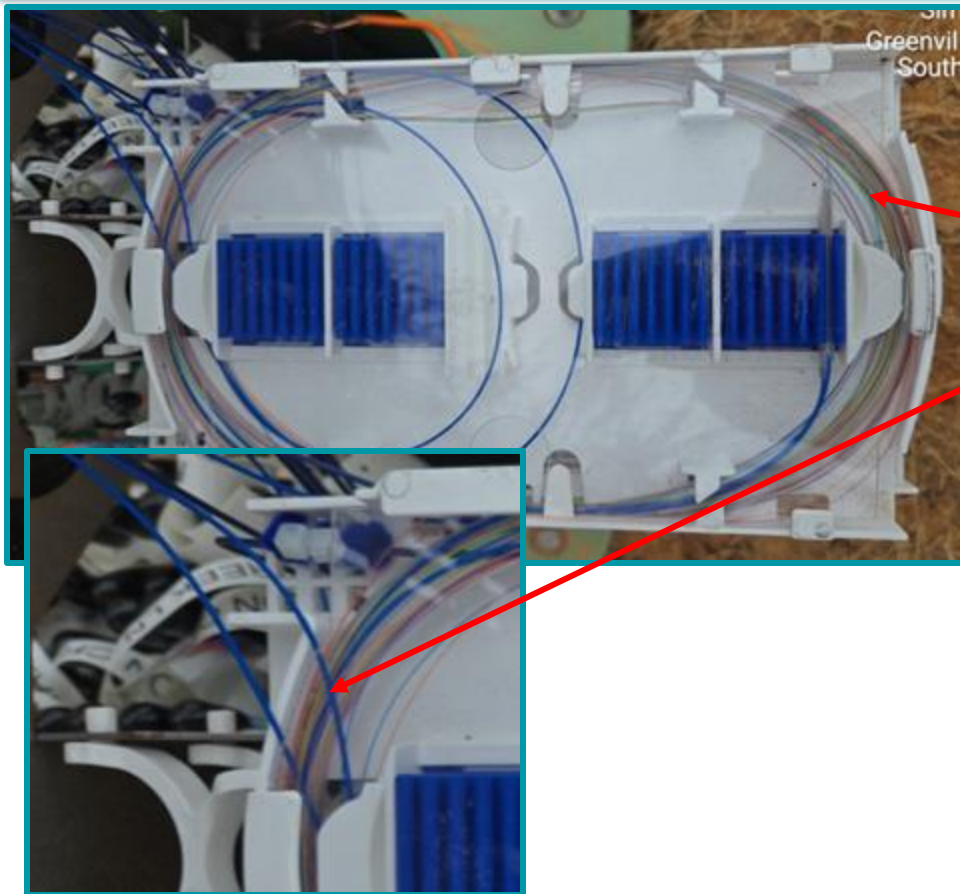
#	Securing the Buffer Tubes In the Basket	Error Codes
2	Ensure 2 to 3 wraps of fiber slack are routed & stored in a manner that allows for ease of access	EC-SP-03.D.2
S	What not to do: Ensure all buffer tubes and / or splitter tails are secured with felt and zip-tied to the tray	EC-SP-03.D.1
BP	(Note: *Feeder fibers should be stored on the bottom tray in dome infrastructure and in a **Feeder fibers should be stored in the trop tray for Pedestal infrastructure) ***Arrange splice trays in such a manor that someone will not need to move past spliced fiber trays to get to the spare fibers	

Fiber Management & Enclosure Types

Section SP-04

SP-04.A - M4A 350 Pedestal & Slack Structure

SP-04.B - M4A 350 Pedestal [Splitter Placement]

SP-04.C - M4A 350 Pedestal [Conduit Labeling]

SP-04.D - M4 Splitter Diagram / Fiber Management

SP-04.E - M4 Splitter [Cable Entry]

SP-04.F - M4 Splitter [Splice Tray]

SP-04.G - M4 Splitter Closure [Vault]

SP-04.H - Cabinet [Legacy Deployment]

SP-04.I - In Structure Splice Dome [Legacy Deployment]

SP-04.J - Vault Lid Security [Legacy Deployment]

SP-04.K - Splice Dome Fiber Management [Legacy Deployment]

SP-04.L - Splice Dome [Legacy Deployment]
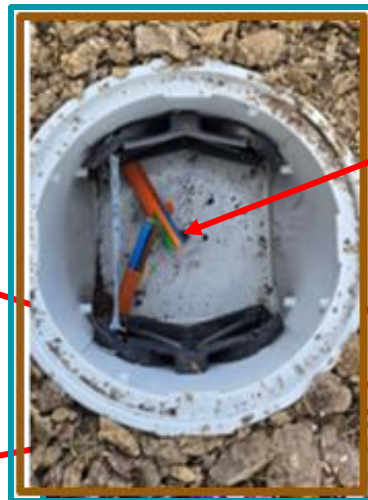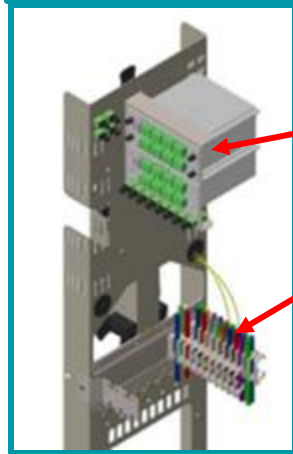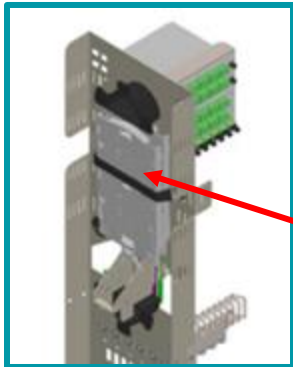
#	M4A 350 Pedestal	Error Codes
1	Ensure cable slack is stored in the slack structure [30']	EC-SP-04.A.1
2	Feeder & Distribution Fiber should be brought in on the splitter side (network side of the structure) **Note:** The feeder cable should brought in on the righthand side of the structure	EC-SP-04.A.2
3	Splitters are to be attached on the street side of the structure and centered on the mounting bracket	EC-SP-04.A.3
4	Splice trays are to be attached on the customer facing side of the structure	EC-SP-04.A.4
5	Conduits containing fiber MUST have a strain relief plug installed to aid in keeping water out of the conduit	EC-SP-04.A.5
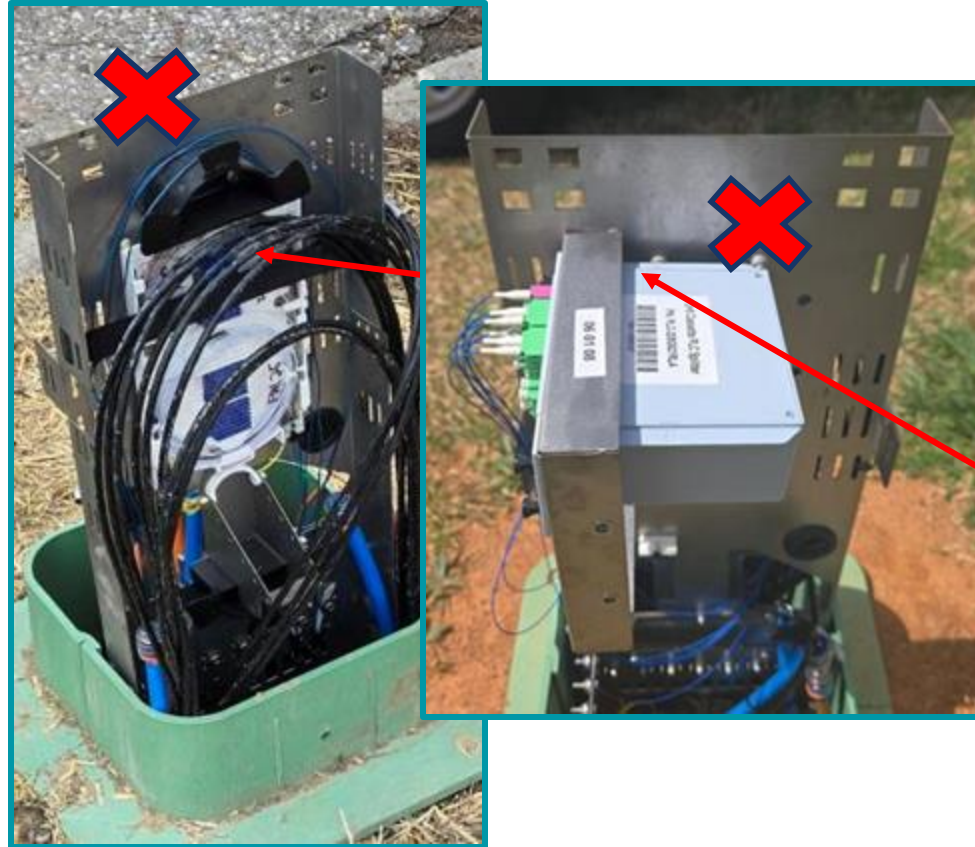
#	M4A 350 Pedestal	Error Codes
S	**What Not To DO:** Feeder cables should NEVER be stored in the pedestal	EC-SP-04.A.1
S	**What Not To DO:** Splitters must be attached to the structure in the center of the mounting bracket so the lid can be placed / removed without damaging the fiber inside	EC-SP-04.A.3

SP-04.C - M4A 350 Pedestal [Conduit Labeling]

#	M4A 350 Pedestal	Error Codes
1	Feeder fiber **MUST** always be spliced in the top tray and secured to the mounting bracket with a Velcro strap Note: Feeder conduits and feeder fiber MUST always be brought in on the network side of the structure	EC-SP-04.C.1
2	The remaining splice trays are meant for distribution fiber splicing work and MUST be secured to the mounting bracket with a Velcro strap Note: Distribution conduits and fiber MUST always be brought in on the network side of the structure	EC-SP-04.C.2
3	Ensure that all microducts are properly labeled and capped. **Note:** When installing blown fiber in the ducts, ensure the strain relief plugs are installed	EC-SP-04.C.3

SP-04.D - M4 Splitter Diagram / Fiber Management
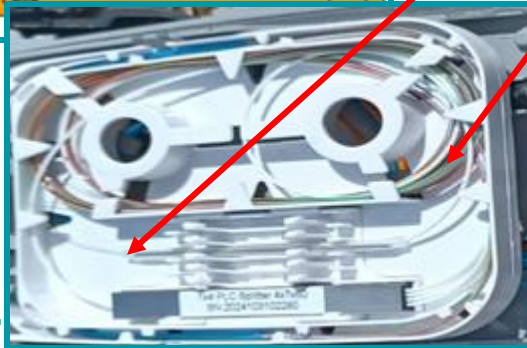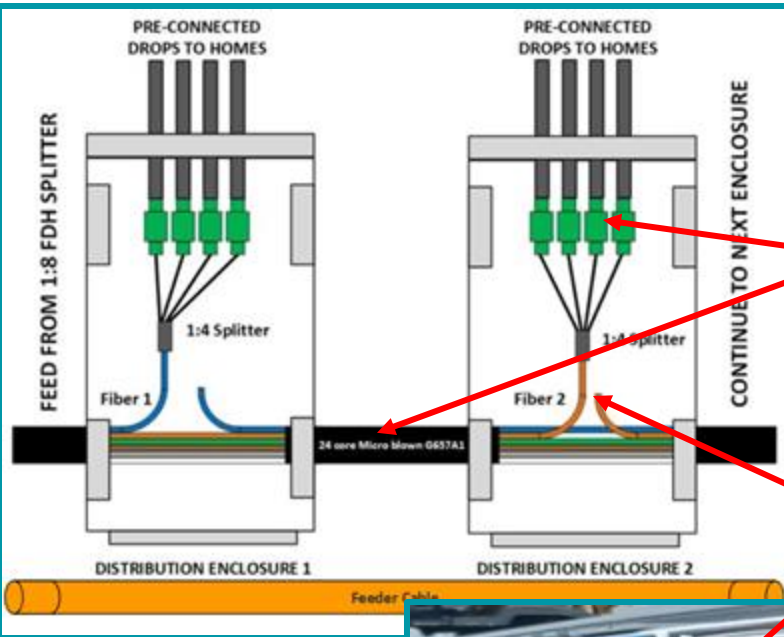
#	FDH Distribution Fiber Cable Routing	Error Codes
1	12 or 24 count cables are installed in a 4-way duct from access box to access box until the end of the line	EC-SP-04.D.1
2	At each access box where the distribution cable is installed, a IP68 fiber distribution closure with a 1x4 splitter will be installed	EC-SP-04.D.2
3	Perform a mid-span ring cut and extract the proper fiber and splice to the 1x4 splitter	EC-SP-04.D.3
4	The Uncut remaining fibers will be routed with 2.5 - 3.5 loops of slack stored in the closure then exit to the next downstream closure	EC-SP-04.D.4
5	Ensure the output, cut conduit, has a cap installed to prevent water and debris from entering	EC-SP-04.D.5
BP	Note: Best practice is to leave <> 30% of spare fibers for future use	

SP-04.E - M4 Splitter [Cable Entry]
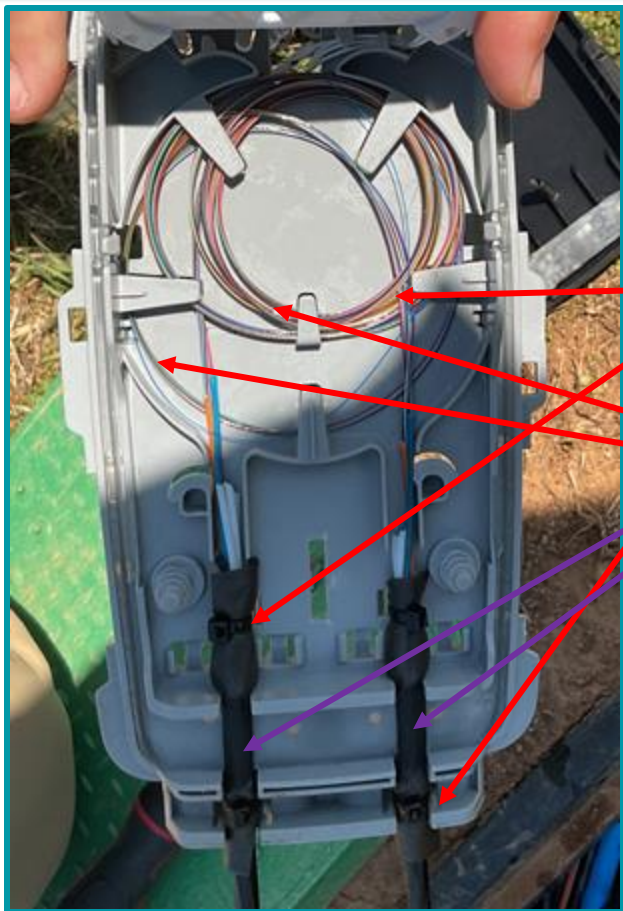
#		Error Codes
1	Ensure the cables that enter the closure are wrapped with a material that, when secured with a zip-tie, will protect the integrity of the cable itself	**EC-SP-04.E.1**
2	Remove 40 inches to 60 inches of buffer Tube	**EC-SP-04.E.2**
3	Remove the buffer tube <> 2 inches from the end of the cable jacket	**EC-SP-04.E.3**
4	Ensure the buffer tube that houses the splitter input fiber is stored on the inner most ring and the (if applicable) the second buffer tube is stored in the outer most ring of the slack storage area	**EC-SP-04.E.4**
BP	Ensure the input side of the cable enter the closure on the left and the output side of the cable exits on the right	
BP	VID-20250320-WA0012.mp4	
BP	M4 INSTALLATION GUIDE.pdf	
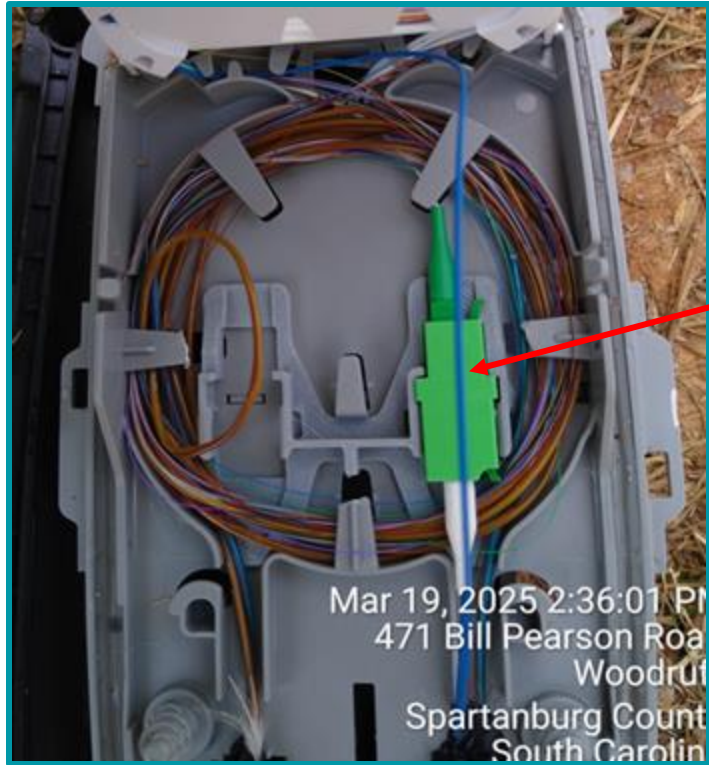
#		Error Codes
BP	**Note:** Be sure to remove the bulkhead from the closure and complete a straight splice onto the splitter input fiber	

SP-04.F - M4 Splitter [Splice Tray]
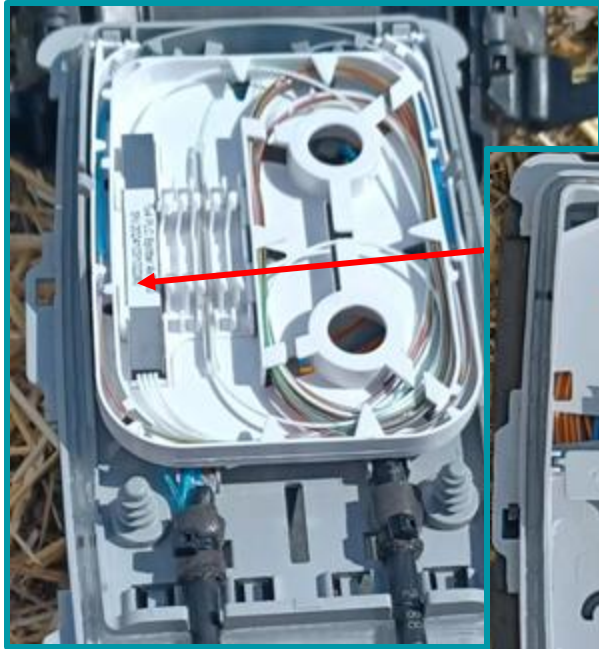
#		Error Codes
1	Fix the splitter in the manufacturer provided slot found in the splice tray Note: In the event the splitter is not secured, Velcro may be affixed to the back side of the splitter and splice tray to better secure the splitter	EC-SP-04.F.1
2	Once splicing work is complete remove the closure sealing tape to expose the adhesive sealing material	EC-SP-04.F.2
3	Ensure the port seals are in place when drop cables are **not** present	EC-SP-04.F.3

SP-04.G - M4 Splitter Closure [Vault]
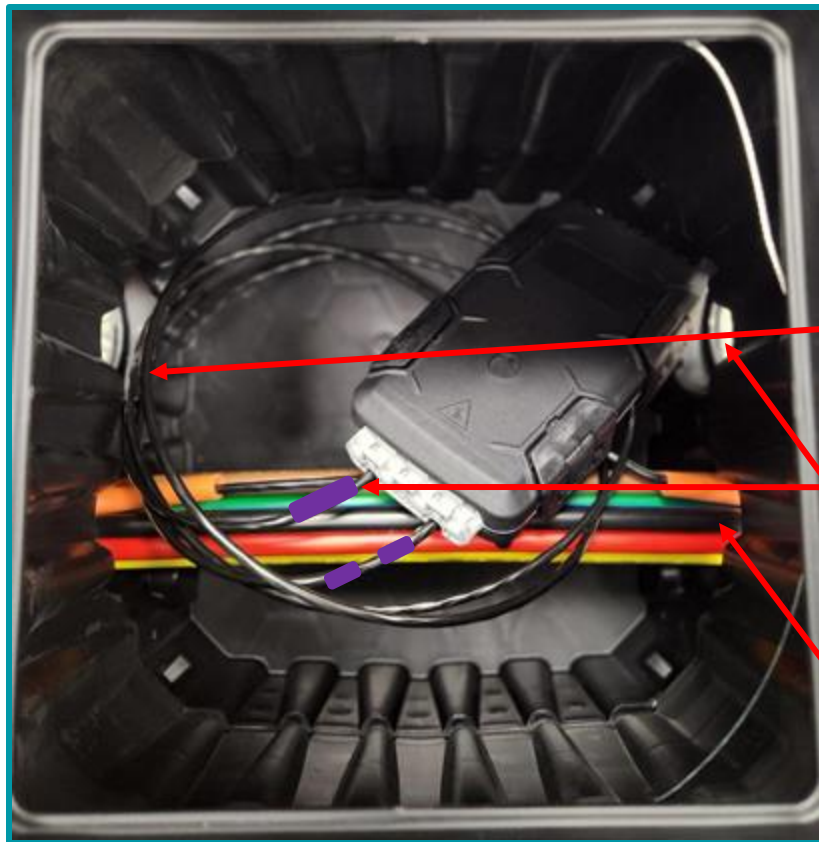
1 Strip of Purple Tape = Signal Input
2 Strips of Purple Tape = Signal Output

#	M4 Splitter Closure	Error Codes
1	Ensure there is 15 feet of slack on both the input & output side of the closure for a total of 30' of slack in the vault	EC-SP-04.G.1
2	Ensure the tracer wire is present in the photo	EC-SP-04.G.2
3	Ensure the properly colored tape is applied	EC-SP-04.G.3
S	Cable is missing proper labeling	
S	Ensure the spare conduit entry points have proper caps in place for sealing purposes	
S	Tracer wire is missing in this photo	
BP	Ensure that the conduit jacket is brought into the structure and is trimmed / tapped	

SP-04.H - Cabinet [Legacy Deployment]

#		Error Codes
1	Ensure all empty conduits are capped	EC-SP-04.H.1
2	Ensure any conduits containing fiber have the strain relief plugs installed	EC-SP-04.H.2
3	Ensure all conduits containing the microducts are sealed with "Duct Seal"	EC-SP-04.H.3

SP-04.I - In Structure Splice Dome [Legacy Deployment]

#		Error Codes
1	Ensure all domes are properly attached to the vault sidewall	**EC-SP-04.I.1**
2	Ensure all conduit bundles are of the same length and tapped together properly	**EC-SP-04.I.2**
S	**What not to do:** The conduit bundles are not secured together with tape	
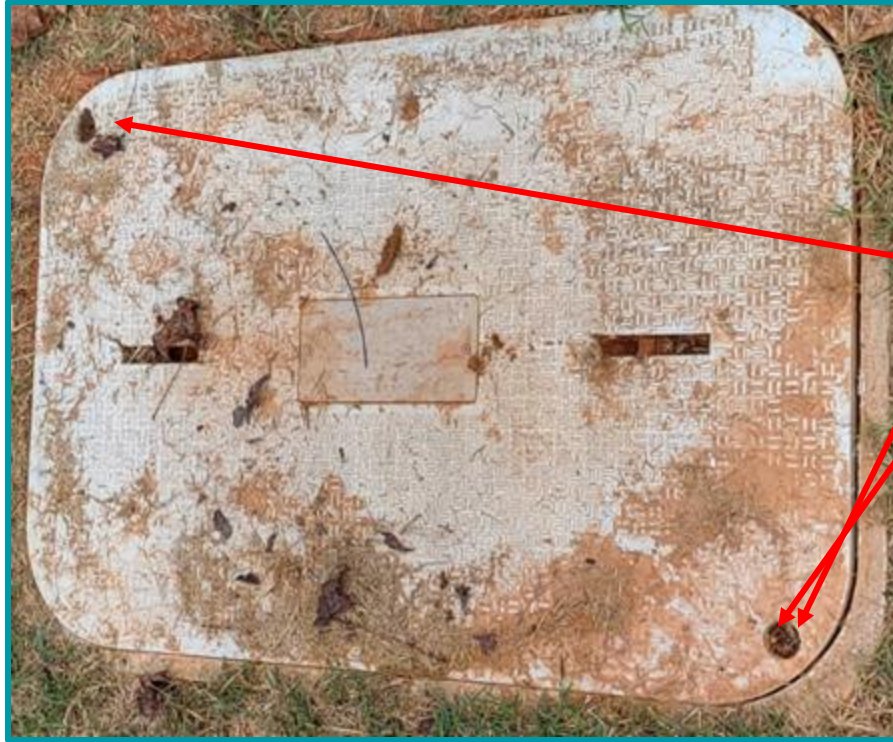
#	Toby Box	Error Codes
1	Ensure all vault lids are secured with bolts (7/16th or 9/16th bolt head)	EC-SP-04.J.1
S	**What not to do:** Lid missing bolts	
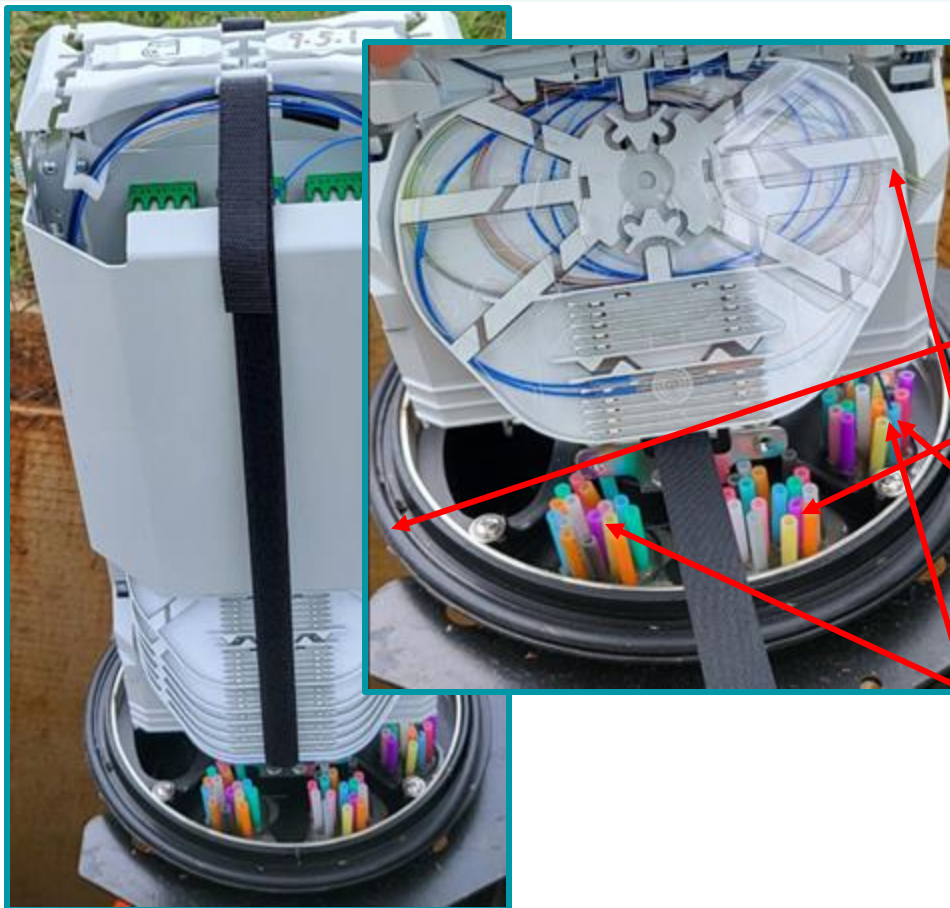
#		Error Codes
1	Ensure the rubber grommet is in place prior to replacing the lid	EC-SP-04.K.1
2	Ensure the unused conduits are capped	EC-SP-04.K.2
3	Ensure conduits with fiber have the strain relief plugs installed	EC-SP-04.K.3
S	**What not to do:** Poor fiber management in the tray	
S	**What not to do:** Empty conduits are not capped	
S	**What not to do:** Conduits with fiber are missing the strain relief plugs	

SP-04.L - Splice Dome [Legacy Deployment]
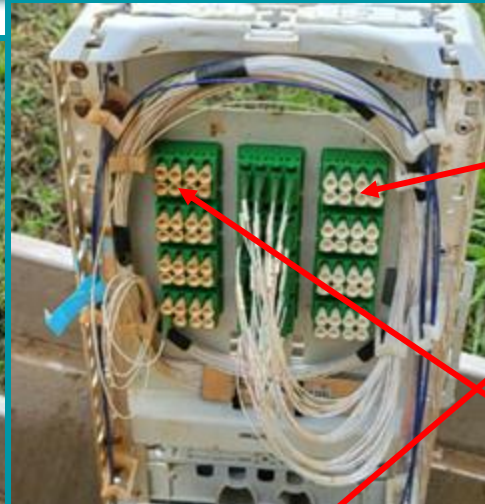
#	Toby Box	Error Codes
1	Ensure all unused ports are properly capped	**EC-SP-04.K.1**
S	Ensure all unused conduits are capped	
S	Ensure the "O" ring, rubber, grommet is placed prior to securing the closure lid	
	Note: Due to the missing conduit caps and "O" ring, rubber, grommet – the integrity of this closure has been compromised via the intrusion of water	

Feeder, Distribution, and Drop Fiber [Testing Scenarios]

Section SP-05

SP-05.A - Fiber Testing

SP-05.B - Feeder Fiber Testing

SP-05.C - Distribution Fiber Testing

SP-05.D - Drop Fiber Testing

SP-05.E - Optical Light Level Budget

SP-05.F - Connector Types

Testing Scenarios

The following testing scenarios are based on when fiber is installed and / or spliced into Ripple fibers network. In the context of this guide, a splice is inclusive of fiber to fiber, or fiber to connector. Testing scenarios will include use of organic light and segment testing in a 1x32 architecture, and a 1x64 (in-line splitter only) architecture.

Centralized 1x32 Split Ratio - Using Passive Cabinet

Distributive 1x64 Split Ratio - Using Inline Splitters

SP-05.B - Feeder Fiber Testing

#	Feeder Fiber Testing	Error Codes
1	Ensure all light levels are tested at 1490nm & 1577nm (1577nm for customers that order 2gig speeds)	EC-SP-05.B.1
2	Light Level testing via a power meter must occur on all newly spliced fibers, 2 per buffer tube, between the feeder hub and FDH	EC-SP-05.B.2
3	Additionally, feeder splice points designated for mid-cable access splices must be light level tested via a power meter when organic light is present from the POP to the distribution hub	EC-SP-05.B.3
BP	*Un spliced Fibers Will Not Require Testing.*	___

SP-05.C - Distribution Fiber Testing

#	Distribution Fiber Testing	Error Codes
1	Ensure all light levels are tested at 1490nm & 1577nm (1577nm for customers that order 2gig speeds)	**EC-SP-05.C.1**
2	Light Level testing via a power meter must be captured on one newly spliced fiber per fiber tube spliced from the FDH to the corresponding access handhole closures.	**EC-SP-05.C.2**
BP	*Unspliced Fibers Will Not Require Testing.*	——

SP-05.D - Drop Fiber Testing

#	Drop Fiber Testing	Error Codes
1	Light level testing must be captured on all newly installed / spliced fibers at the NID	EC-SP-05.D.1
2	Ensure the light level loss is between .5 dbmv & 1 dbmv @ 1550 nm	EC-SP-05.D.2

SP-05.E - Optical Light Level Budget (1x64)

OPTICAL BUDGET ON 1:64 SPLIT RATIO

Loss Budget Table			MIN	MAX
Total Splitter Ratio	dB Loss	UOM	1:128	1:128
Fusion Splice	.1 dB	each	10	20
Connector LC/APC	.3 dB	each	4	4
1:2 Splitter	3.0 dB	each	1	1
1:4 Splitter	6.0 dB	each	1	1
1:8 Splitter	9.0 dB	each	1	1
1:16 Splitter	12.0 dB	each	0	0
1:32 Splitter	15.0 dB	each	0	0
Single Mode Fibre P/Km	.2 dB	p/km	0.1	10
	Total Optical dB Loss		-26 dB	-29 dB
	Transmitter OLT Output XGS-PON		+7.0 dBm	+7.0 dBm
			-16.5 dBm	**-19.2 dBm**
	Receiver Power			

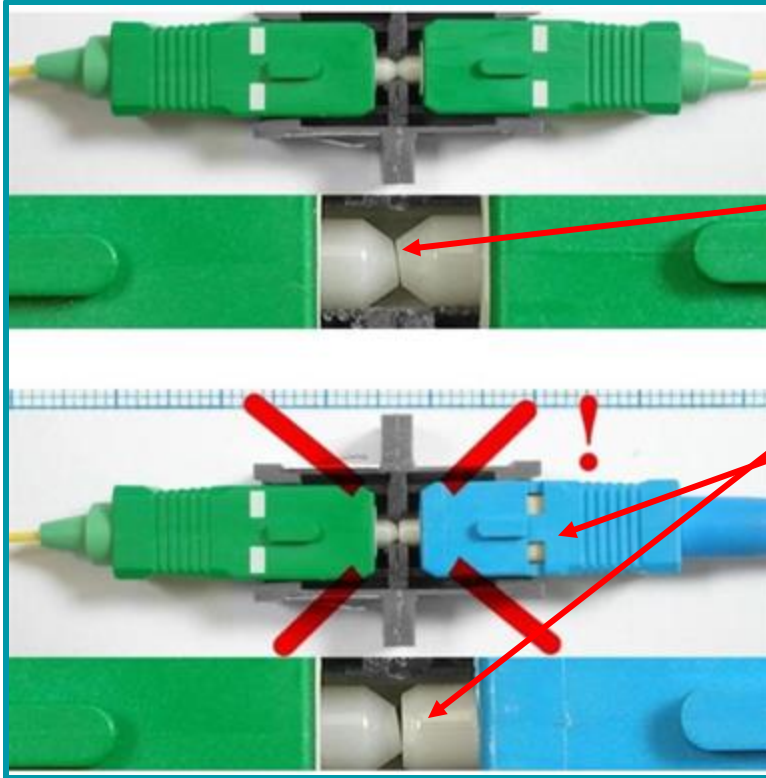| #	Optical Light Level Budget	Error Codes
BP	The Nokia XGS-PON equipment has a light sensitivity of between −8dBm & -23dBm.	
BP	The OLT has a launching power of between +7dBm or +5dBm where as the ONT launches a returning light of around +3dBm or +2dBm.	
BP	Tx refers to the transmitting signal of the point in place where you are testing	
BP	Rx refers to the receiving signal of the point in place where you are testing (ex: At the ONT the TX is the signal from the ONT to the OLT and RX is the signal from the OLT to the ONT)	
BP	Note: The ideal threshold is to not exceed a distance of 10km (or 6.2 miles from the OLT to the final ONT	

SP-05.E - Optical Light Level Budget (1x128)

OPTICAL BUDGET ON 1:128 SPLIT RATIO

Loss Budget Table			MIN	MAX
Total Splitter Ratio	dB Loss	UOM	1:128	1:128
Fusion Splice	.1 dB	each	10	20
Connector LC/APC	.3 dB	each	4	4
1:2 Splitter	3.0 dB	each	0	0
1:4 Splitter	6.0 dB	each	2	2
1:8 Splitter	9.0 dB	each	1	1
1:16 Splitter	12.0 dB	each	0	0
1:32 Splitter	15.0 dB	each	0	0
Single Mode Fibre P/Km	.2 dB	p/km	0.1	10
Total Optical dB Loss			-26 dB	-29 dB
Transmitter OLT Output XGS-PON			+7.0 dBm	+7.0 dBm
			-18.5	**-22.2**
Receiver Power			**dBm**	**dBm**

#	Optical Light Level Budget	Error Codes
BP	The Nokia XGS-PON equipment has a light sensitivity of between – 8dBm & -23dBm.	
BP	The OLT has a launching power of between +7dBm or +5dBm where as the ONT launches a returning light of around +3dBm or +2dBm.	
BP	Tx refers to the transmitting signal of the point in place where you are testing	
BP	Rx refers to the receiving signal of the point in place where you are testing (ex: At the ONT the TX is the signal from the ONT to the OLT and RX is the signal from the OLT to the ONT)	
BP	Note: The ideal threshold is to not exceed a distance of 10km (or 6.2 miles from the OLT to the final ONT	

#	Connector Types	Error Codes
1	APC Connector – These are typically green with an angled tip.	EC-SP-05.F.1
2	UPC connector – These are typically blue with a straight tip.	EC-SP-05.F.2
3	Note: These two types of connectors should NEVER be used in the same bulkhead	EC-SP-05.F.3

Feeder, Distribution, and Drop Fiber [Testing Considerations]

Section SP-06

SP-06.A - Testing Considerations

SP-06.B - Distribution Fiber Testing Considerations

SP-06.C - Access Fiber Testing Considerations

SP-06.D - Drop Fiber Testing Considerations

Testing Considerations:

This section describes the various tests that must be performed during the aforementioned testing scenarios. Each section below corresponds to the testing scenario above.

a. OTDRs, with a launch cable, must be used to validate the integrity of the cable and splicing work.
   o Each live fiber must have a OTDR test.
   o OTDR test the first and last fiber, per buffer tube, for dark or spare fibers.
b. Testing deliverables must include PDF or image file (jpeg, png, etc.) test results showing passing test results.
c. The addition of an optical attenuator (1dB, 5dB, 7dB, etc) should be considered under the following Presumptions:
   o Power meter measurements exceeding the upper parameters of the acceptance criteria covered in the Acceptance Parameters effectively causing packet loss issues.
   o Attenuators can be installed at Ripple-owned infrastructure such as an FDH. Limited access facilities should not be considered suitable for housing attenuators.
   o Attenuators should not be installed too close to the laser source which can occur at the POP.

G-PON

☐ **wavelengths**: Over a single bidirectional fiber – in this case GPON use Wavelength Division Multiplexing (WDM) with 1490 nm wavelength for downstream traffic and 1310 nm wavelength for upstream traffic

XGS-PON

3. **Wavelengths**:
- **Upstream and Downstream**: XGS-PON operates at specific wavelengths, with the downstream at 1577 nm and the upstream at 1270 nm. These wavelengths are part of the PON transmission window (1260-1650 nm), allowing XGS-PON to co-exist with other PON standards, like G-PON and NG-PON2, on the same fiber.

SP-06.B - Feeder Fiber Testing Considerations

#	Feeder Fiber Testing Considerations	Error Codes
1	The splitter input fiber should be tested to document the input light level. 2 of the output splitter tails should be tested to ensure the integrity of the splitter and splice	EC-SP-06.B.1
2	Conduct a OTDR test on 2 of the splitter tails to ensure a clean fiber path and splice has occurred	EC-SP-06.B.2

SP-06.C - Distribution Fiber Testing Considerations
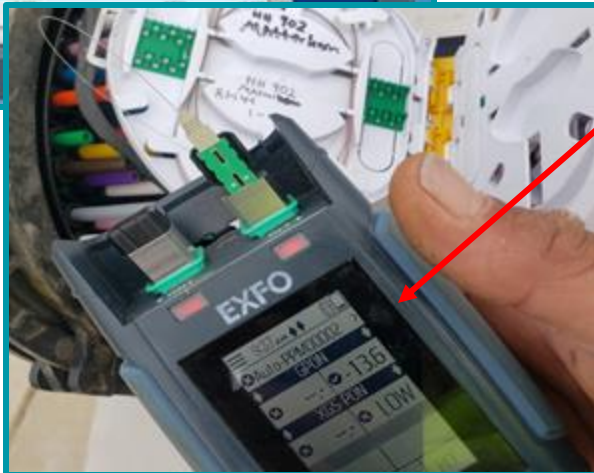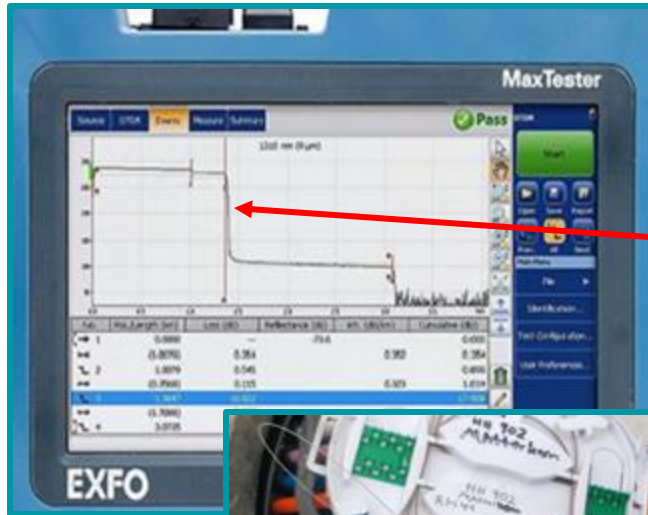
#	Distribution Fiber Testing Considerations	Error Codes
1	Perform a light level test on the input fiber feeding the splitter at each Access Handhole closure	EC-SP-06.C.1
2	Perform a Light Level test on each port of the Access Handhole closure	EC-SP-06.C.2
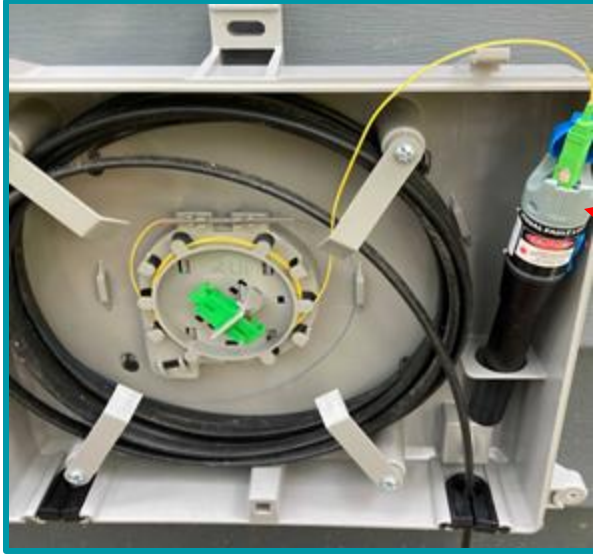
#	Drop Fiber Testing Considerations	Error Codes
1	In the event a poor light level test is captured, utilize a VFL to verify that the splice is good and the fiber is undamaged	EC-SP-06.D.1
2	Test the light level at 1550nm (1490 or 1577)	EC-SP-06.D.2

OSP Labeling

Section LB-01

Introduction

- This document covers field labeling standards on Ripple Fibers OSP infrastructure from the POP to the customer premises. Field labeling covered within this document is intended to support construction tracking, new service installation, and troubleshooting processes.

LB-01.B - Network Overview

Full Network Overview [Engineering Layers]	
OLT Zone	The total area covered by a single OLT
FDA	A manageable cluster of FDH's within an OLT zone used for permitting and construction
FDH	A cluster of homes within an FDA and OLT zone that are connected back to a common handhole or pedestal.
Full Network Overview [Physical Layers]	
Backhaul Layer	The connection between the data center and the POP's / OLTS commonly referred to as the core transport layer.
Feeder Layer	The optical fiber network layer feeding from the OLT active equipment throughout the greater area allocated to be converged by the designated OLT equipment to the FDH handholes.
Distribution Layer	The optical layer that runs from the FDH past the homes and terminates outside the allocated homes in an access box / handhole.

LB-01.C - Fiber Cable Naming Scheme

Fiber Cable Naming Convention
● The following Cable Names will be implemented
● Project Code – Cable Size – Cable Type Cable Number

Description	Project Code	Cable Size	Cable Type	Example
Transport Cable	Project Code from Primary OLT Project 6 Digit Project Code (OLT Level)	24F	T	MIWC13-MIWC12-24F-T1
Core Feeder Cables	6 Digit Project Code (OLT Level)	288F 144F 72F	C	MIWC13-288F-C1
Link Feeders Cables	8 Digit Project Code (FDA Level)	48F 24F 12F	F	MIWC1310-24F-F1
Distribution Cables	10 Digit Project Code (FDH Level)	24F 12F	D	MIWC131004-24F-D1

Ripple Fiber Naming Convention	
XXYYZZaabb Exp: NCUC031004	XX - North Carolina
	YY - Union County
	ZZ - OLT 3
	aa - FDA 10
	bb - FDH 4

LB-01.D - Fiber Structure & Enclosure Naming Scheme

Chamber [Structure] Naming Convention ● Project Code (10 Digit) – Chamber Type Chamber Number (3 Digits)		
Description	**Handhole Type**	**Example**
Large Handhole	LH	MIWC131004-LH001
Medium Handhole	MH	MIWC131008-MH001
Access Handhole (UG300 and Rhi-Node)	AH	MIWC131002-AH001

Fiber Enclosure Naming Convention ● Handhole Name – Enclosure Type - Enclosure Number (1 Digit)		
Description	**Enclosure Type**	**Example**
Enclosure used for Transport Cable	TE	MIWC131004-LH001-TE1
Enclosure used for Feeder Cable	FE	MIWC131004-LH001-FE1
Enclosure used for Distribution Cable	DE	MIWC131002-AH003-DE1

Splitter Naming Convention ● Project Code (10 Digit) – Splitter Type - Splitter Number (3 Digits)		
Description	**Splitter Type**	**Example**
1:4 Splitter	SP4	MIWC131004-SP4-001
1:8 Splitter	SP8	MIWC131008-SP8-026
1:X Splitter	SPX	MIWC131009-SPX-041

Field Labeling Objectives

Section LB-02

LB-02.A - Field Labeling Objectives

LB-02.A - Field Labeling Objectives

Ripple Fiber's field labeling objectives are as follows:

- Deploy a standardized method of labeling that appropriately fits the environment in which the field label will reside (ex. Tag selection based on indoor / outdoor application).

- Standardize field labeling best practices that are consistent across all Ripple Fiber markets to support both internal and external personnel.

- Prioritize where and when field labels will be utilized for the sake of labeling efficiency.

- Create a system of field labeling that will support future integration of real time GIS construction tracking and OSP asset management.

Components Requiring Field Labels

Section LB-03

LB-03.A - Fiber Cable

LB-03.B - Fiber Enclosure

LB-03.C - NID Labeling

LB-03.A - Fiber Cable

1. **Transport** Cable (**Blue Tape**) [**Slack** Vault Locations]
   a. Affix the tag with the cable ID, machine printed - black ink on white label, to the cable with zip-ties
      i. Place a **single** strip of **Purple** Tape (Input Side) just before the first zip-tie
      ii. Place **2** strips of **Purple** Tape (Output Side) just after the second zip-tie
2. **Core Feeder** Cables (**Orange Tape**) [**Slack** Vault Locations]
   a. Affix the tag with the cable ID, machine printed - black ink on white label, to the cable with zip-ties
      i. Place a **single** strip of **Purple** Tape (Input Side) just before the first zip-tie
      ii. Place **2** strips of **Purple** Tape (Output Side) just after the second zip-tie
3. **Link Feeder** Cables (**Yellow Tape**) [**Slack** Vault Locations]
   a. Affix the tag with the cable ID, machine printed - black ink on white label, to the cable with zip-ties
      i. Place a **single** strip of **Purple** Tape (Input Side) just before the first zip-tie
      ii. Place **2** strips of **Purple** Tape (Output Side) just after the second zip-tie
4. **Distribution** Cables (**Red Tape**) [**Slack** Vault Locations]
   a. Affix the tag with the cable ID, machine printed - black ink on white label, to the cable with zip-ties
      i. Place a **single** strip of **Purple** Tape (Input Side) just before the first zip-tie
      ii. Place **2** strips of **Purple** Tape (Output Side) just after the second zip-tie

LB-03.B - Fiber Enclosure

1. **Transport Enclosure**
   a. **Input**
      i. Place **1** strip of **Purple Tape** on the cable, <> 6 inches from the cable entry point into the closure, indicating the Input signal path
   b. **Output**
      i. Place **2** strips of **Purple Tape** on the cable, <> 6 inches from the cable exit point leaving the closure, indicating the Output signal path
   c. **Tag**
      i. Place the machine printed, black ink on a white label, onto the input cable (via zip-ties) <> 12 inches from the closure entry point
      ii. Place the machine printed, black ink on a white label, onto the output cable (via zip-ties) <> 12 inches from the closure exit point

2. **Core Feeder Enclosure**
   a. **Input**
      i. Place **1** strip of **Purple Tape** on the cable, <> 6 inches from the cable entry point into the closure, indicating the Input signal path
   b. **Output**
      i. Place **2** strips of **Purple Tape** on the cable, <> 6 inches from the cable exit point leaving the closure, indicating the Output signal path
   c. **Tag**
      i. Place the machine printed, black ink on a white label, onto the input cable (via zip-ties) <> 12 inches from the closure entry point
      ii. Place the machine printed, black ink on a white label, onto the output cable (via zip-ties) <> 12 inches from the closure exit point

3. **Feeder Enclosure**
   a. **Input**
      i. Place **1** strip of **Purple Tape** on the cable, <> 6 inches from the cable entry point into the closure, indicating the Input signal path
   b. **Output**
      i. Place **2** strips of **Purple Tape** on the cable, <> 6 inches from the cable exit point leaving the closure, indicating the Output signal path
   c. **Tag**
      i. Place the machine printed, black ink on a white label, onto the input cable (via zip-ties) <> 12 inches from the closure entry point
      ii. Place the machine printed, black ink on a white label, onto the output cable (via zip-ties) <> 12 inches from the closure exit point

4. **Distribution Enclosure**
   a. **Input**
      i. Place **1** strip of **Purple Tape** on the cable, <> 6 inches from the cable entry point into the closure, indicating the Input signal path
   b. **Output**
      i. Place **2** strips of **Purple Tape** on the cable, <> 6 inches from the cable exit point leaving the closure, indicating the Output signal path

LB-03.C - NID Labeling

NID Labeling:

The following labels must be added at the time light level testing occurs at the NID. Labeling must be legible, permanent, and not directly exposed to UV light. Labeling should be machine printed, black ink on a white label, and placed on the inside of the NID door. (See NID Labeling) Marking must include the following:

1. **Address Number & / or Unit Number**
   a. Labeling should be located near the top of the door to leave space for retests, new fiber drops to NID, or future additional units (ADUs).
   b. Unit Number must be used if there are multiple units at the same street address.
2. **Date of Install**
   a. Date should be formatted to read "mm/dd/yyyy".

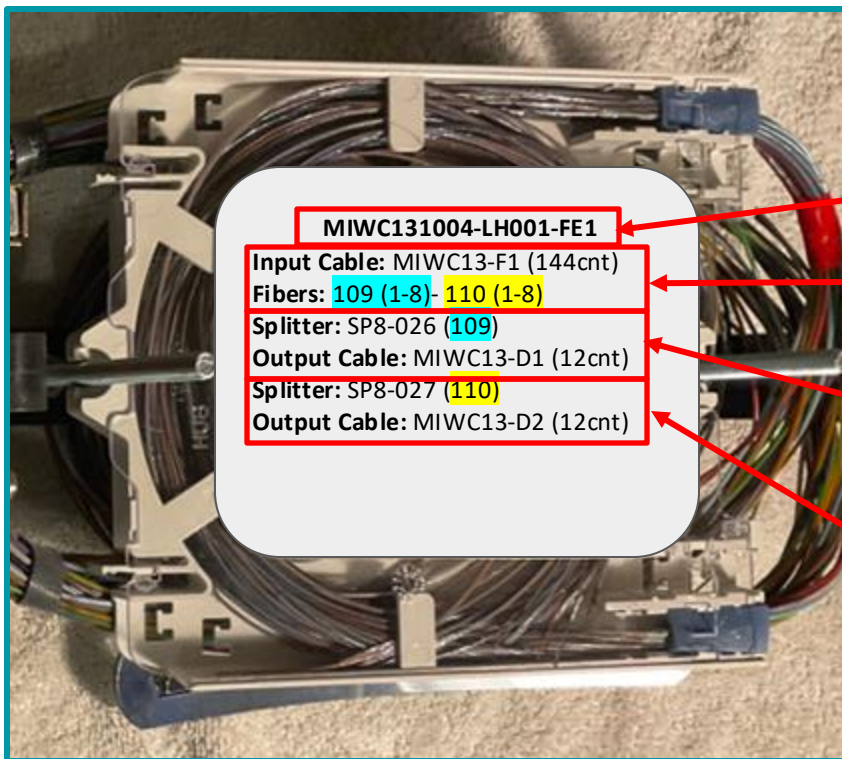# Cabinet Types & Locations

Section LB-04

1. **POP**

Splice Point Locations & Enclosures

Section LB-05

LB-05.A - FDH Splice Tray Label [Labeling Example]

LB-05.B - M4 Internal Labeling

LB-05.C - M4 Tray External Labeling [Labeling Example]

LB-05.A - FDH Splice Tray Label [Labeling Example]

MIWC131004-LH001-FE1

Input Cable: MIWC13-F1 (144cnt)
Fibers: 109 (1-8)- 110 (1-8)
Splitter: SP8-026 (109)
Output Cable: MIWC13-D1 (12cnt)
Splitter: SP8-027 (110)
Output Cable: MIWC13-D2 (12cnt)

#	FDH	Error Codes
1	This is the Closure ID	EC-LB-05.A.1
2	• This is the Cable ID and Fiber Count • This is the Input Fiber that will Feed the Fibers on the Output Cable	EC-LB-05.A.2
3	• This is the Splitter ID • This is the Output Cable ID and Fiber Count • These are the Fibers that will have light on them – feeding the downstream closures	EC-LB-05.A.3
4	• This is the Splitter ID • This is the Output Cable ID and Fiber Count • These are the Fibers that will have light on them – feeding the downstream closures	EC-LB-05.A.4

LB-05.B - M4 Internal Labeling

AH003-DE1
Input Cable: MIWC13D1
Fibers: 1 (109)

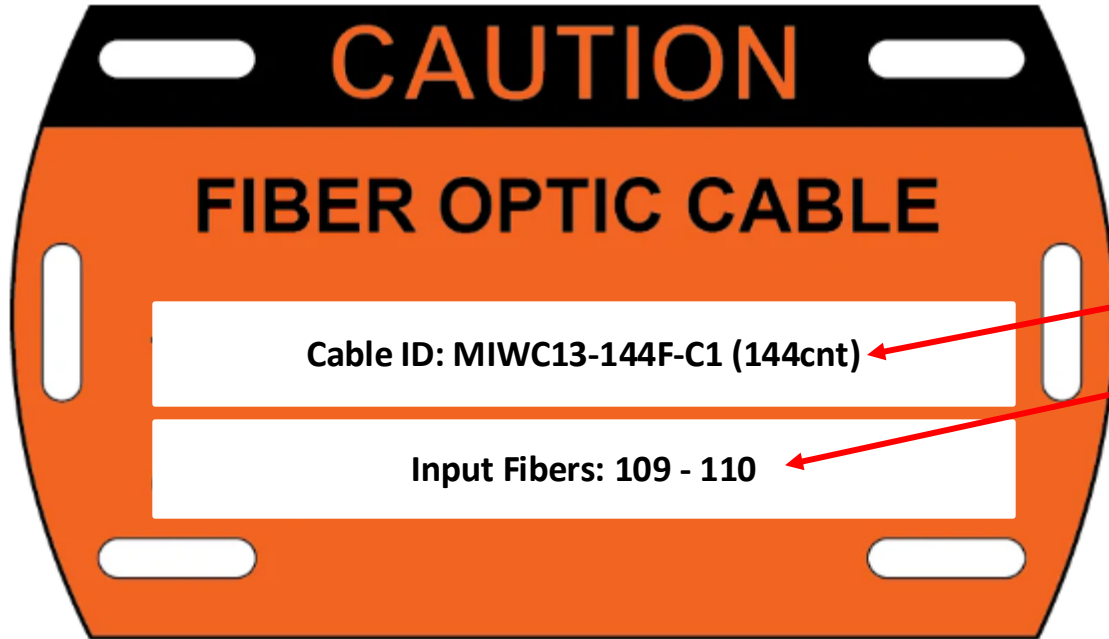| #	M4 Closure	Error Codes
1	This is the Enclosure ID	EC-LB-05.B.1
2	This is the Input Cable ID & Fiber Count	EC-LB-05.B.2
3	• (1) This is the Input Fiber that feeds the internal splitter and the • (109) The feeder fiber that is spliced to the splitter in the upstream FDH	EC-LB-05.B.3

LB-05.C - M4 Tray External [Labeling Example]

AH003-DE1
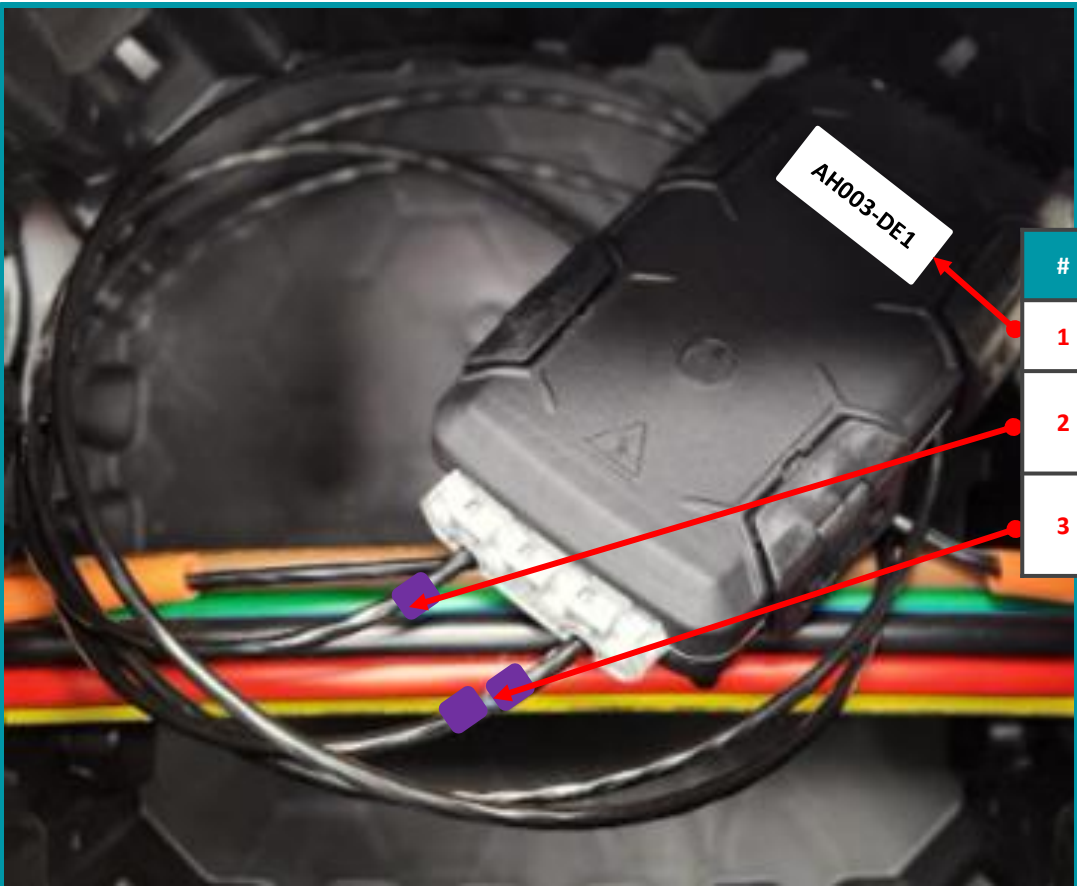
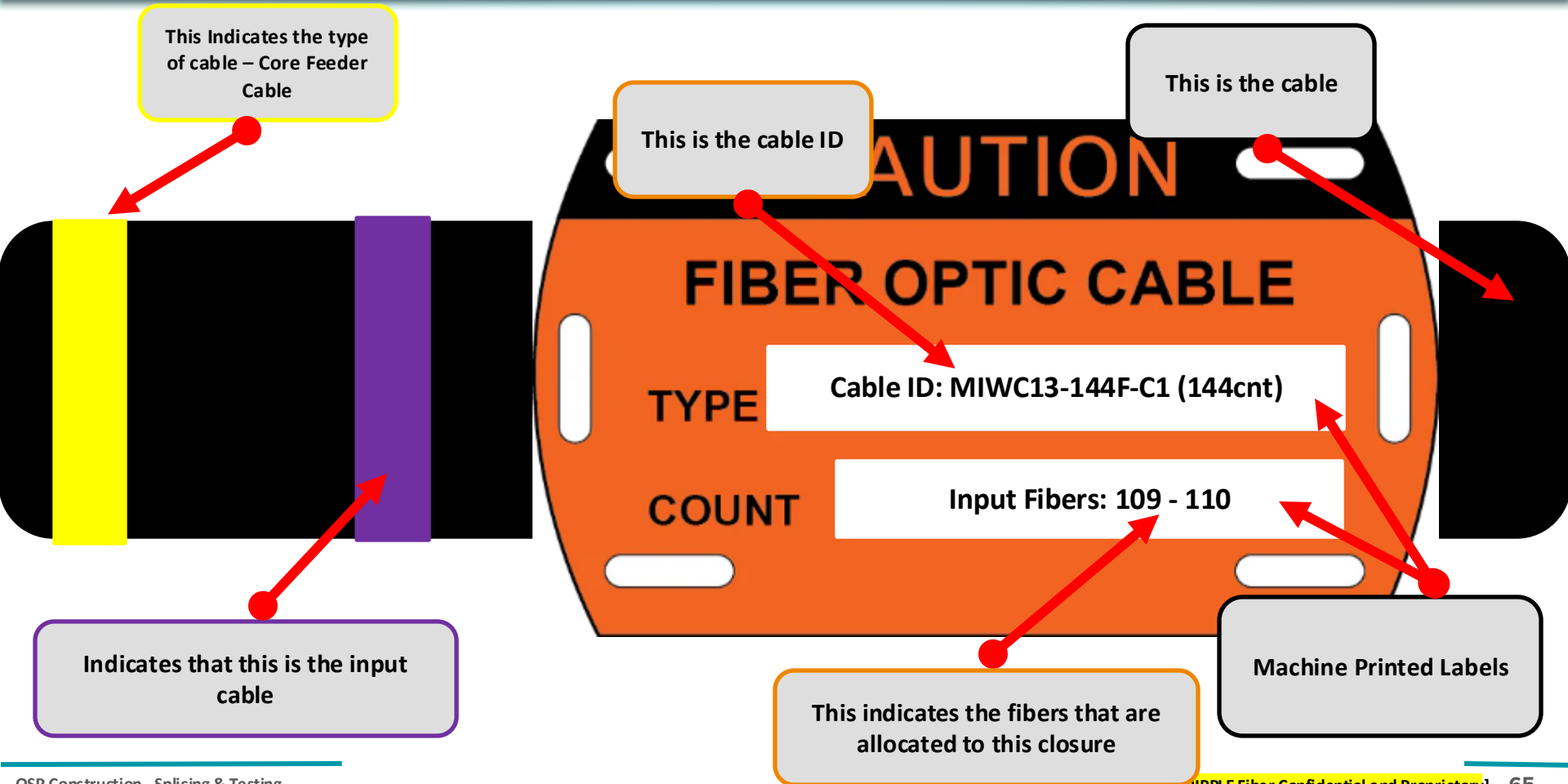| #	M4 Closure	Error Codes
1	Enclosure Name	EC-LB-05.C.1
2	The Single Strand Purple tape indicates the **Input** light flow	EC-LB-05.C.2
3	The Double Strand Purple tape indicates the **Output** light flow	EC-LB-05.C.3

Fiber Cabling Labels

Section LB-06

LB-06.A - Cable Tag [Example]

LB-06.B - Cable Tag Attached to a Core Cable – Input Side [Example]

LB-06.C - Cable Tag Attached to a Core Cable – Output Side [Example]

LB-06.D - Splice Dome Labeling [Example]

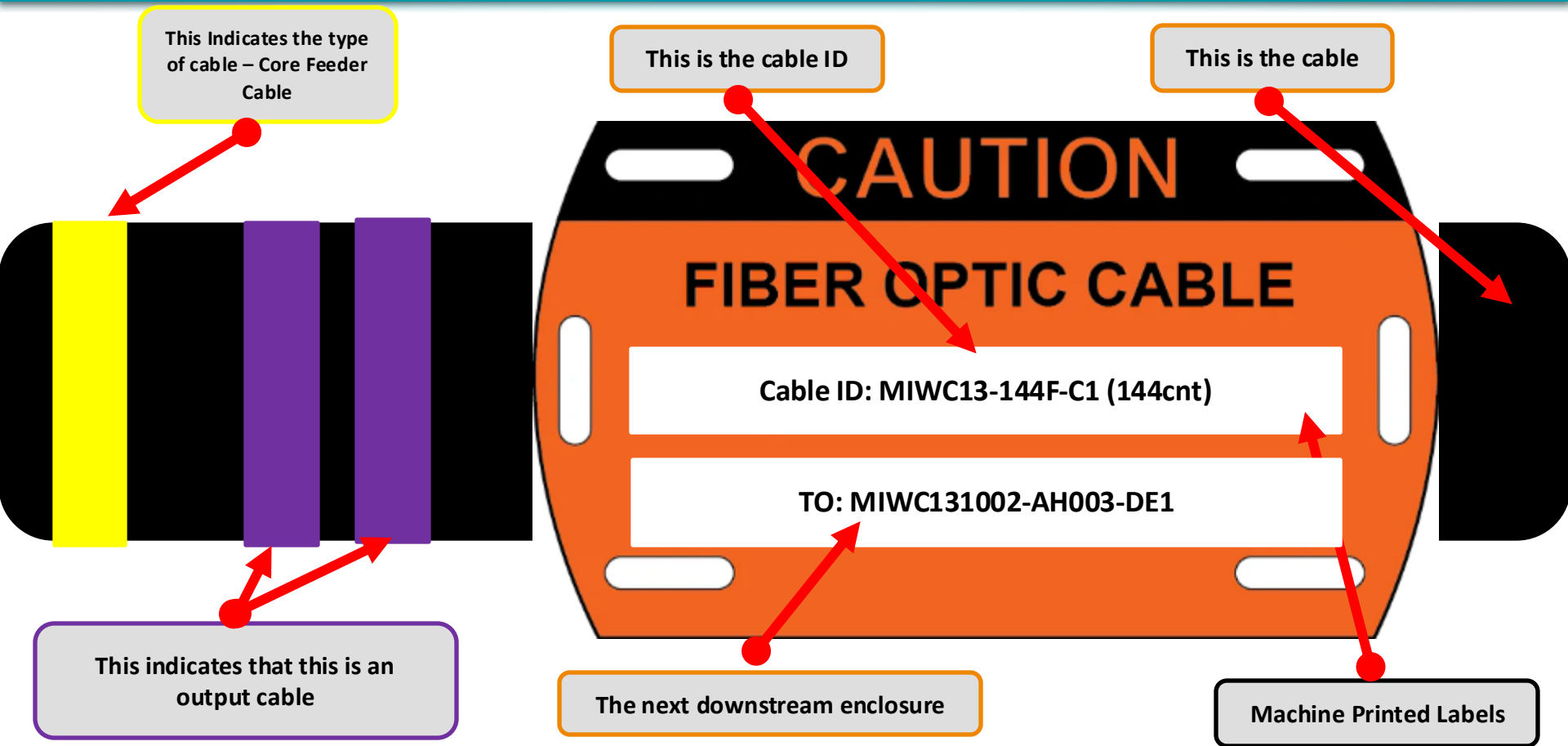LB-06.E - Fiber Cable Labeling [Pedestal Example]

CAUTION

FIBER OPTIC CABLE

Cable ID: MIWC13-144F-C1 (144cnt)

Input Fibers: 109 - 110

#	FDH
1	Cable ID and Fiber count
2	Input Fibers assigned to the closure

This Indicates the type of cable – Core Feeder Cable

This is the cable ID

This is the cable

CAUTION

FIBER OPTIC CABLE

TYPE — Cable ID: MIWC13-144F-C1 (144cnt)

COUNT — Input Fibers: 109 - 110

Indicates that this is the input cable

Machine Printed Labels

This indicates the fibers that are allocated to this closure

This Indicates the type of cable – Core Feeder Cable

This is the cable ID

This is the cable

CAUTION

FIBER OPTIC CABLE

Cable ID: MIWC13-144F-C1 (144cnt)

TO: MIWC131002-AH003-DE1

This indicates that this is an output cable

The next downstream enclosure

Machine Printed Labels

LB-06.D - Splice Dome Labeling [Example]

#		Error Codes
1	Ensure the tag is attached, via zip-ties, to the closure "stinger"	EC-LB-06.D.1
2	Ensure the closure ID is here	EC-LB-06.D.2
3	Ensure the Input fiber count is placed here	EC-LB-06.D.3

LB-06.E - Fiber Cable Labeling [Pedestal Example]

#		Error Codes
1	Single stripe of blue tape indicates the input feeder cable	EC-LB-06.E.1
2	Orange tag has the cable ID, fiber count, and input fibers assigned to the splitter(s)	EC-LB-06.E.2
3	2 stripes of green tape indicates the output distribution cable	EC-LB-06.E.3
4	Orange tag has the cable ID, fiber count, and the downstream closure ID	EC-LB-06.E.4