NT0H65AM **323-1701-221**

Nortel

Optical Metro 5100/5200

Connection Procedures, Part 1 of 2

Standard Release 8.0 Issue 1 April 2005

What's inside...

See Part 2 for the following:

NORTEL

Printed in Canada and the United Kingdom

Contents

About this document

ATTENTION
This document is presented in two parts: Part 1 and Part 2. Each part has its own table of contents. The table of contents in Part 1 contains topics found in Part 1 only. The table of contents in Part 2 contains topics found in Part 2 only.

You are reading Part 1 of *Connection Procedures,* 323-1701-221.

This document provides procedures for connecting the Nortel Optical Metro 5100/5200 product (identified prior to Release 7 as Nortel Networks OPTera Metro 5000-series Multiservice Platform).

Part 1 of the *Connection Procedures* includes:

- accessing internal connectors
- preparing to connect optical components

Part 2 of the *Connection Procedures* includes:

- connecting components

Audience for this document

This document is intended for the following audience:

- strategic and current planners
- provisioners
- installers
- transmission standards engineers
- field maintenance engineers
- system line-up and testing (SLAT) personnel
- maintenance technicians
- network administrators

Optical Metro 5100/5200 library

The Optical Metro 5100/5200 library consists of the *Nortel Optical Metro 5100/5200 Technical Publications*, NT0H65AM.

Technical Publications

The *Optical Metro 5100/5200 Nortel Technical Publications* (NTP) consist of descriptive information and procedures.

Descriptive information

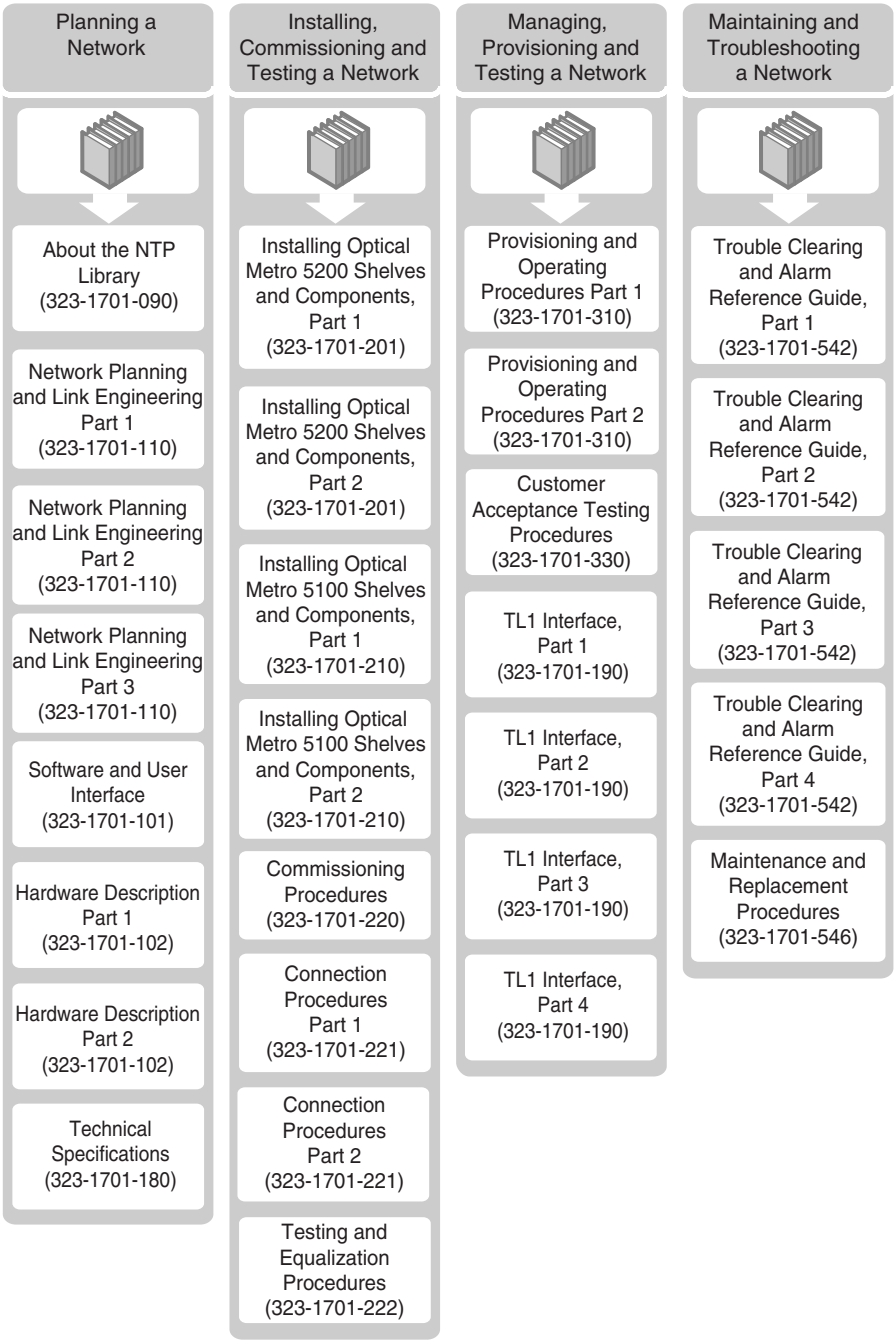
These NTPs provide detailed descriptive information about the Optical Metro 5100/5200 system, including system software and hardware descriptions, technical specifications, ordering information, and TL1 user information.

Procedures

These NTPs contain all procedures required to install, provision, and maintain the Optical Metro 5100/5200 system.

The following roadmap lists the documents in the Optical Metro 5100/5200 library.

OM2805p



Technical assistance service telephone numbers

For technical support and information from Nortel Networks, refer to the following table.

Technical Assistance Service	
For service-affecting problems: For 24-hour emergency recovery or software upgrade support, that is, for: • restoration of service for equipment that has been carrying traffic and is out of service • issues that prevent traffic protection switching • issues that prevent completion of software upgrades	**North America:** 1-800-4NORTEL (1-800-466-7835) **International:** 001-919-992-8300
For non-service-affecting problems: For 24-hour support on issues requiring immediate support or for 14-hour support (8 a.m. to 10 p.m. EST) on upgrade notification and non-urgent issues.	**North America:** 1-800-4NORTEL (1-800-466-7835) ***Note:*** You require an express routing code (ERC). To determine the ERC, see our corporate Web site at www.nortel.com. Click on the Express Routing Codes link. **International:** Varies according to country. For a list of telephone numbers, see our corporate Web site at www.nortel.com. Click on the Contact Us link.
Global software upgrade support:	**North America:** 1-800-4NORTEL (1-800-466-7835) **International:** Varies according to country. For a list of telephone numbers, see our corporate Web site at www.nortel.com. Click on the Contact Us link.

Accessing internal connectors

Use the procedures in this chapter to access the internal connectors of shelf components.

Requirements

Table 1-1 lists the tools and materials required to complete the procedures in this chapter.

Table 1-1
Tools and materials required to access shelf components and connectors

Item	Quantity	Supplied
Antistatic wrist and heel straps	1	no
Fiber-optic cleaning kit	1	no
Fiber inspection scope	1	no
Phillips #1 screwdriver (for OMX Standard)	1	no
Phillips #2 screwdriver (for OMX 16CH DWDM)	1	no
Flathead screwdriver	1	no

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of shelf malfunction
Nortel Networks recommends that you do not use cellular phones at any Optical Metro 5100/5200 site. The use of cellular phones in proximity to Optical Metro equipment can cause shelf malfunction.

CAUTION
Risk of affecting network reliability
To ensure network reliability, clean the fiber connectors before you make connections.

Procedure list

Table 1-2 lists the procedures in this chapter.

Table 1-2
Procedures for connecting shelf components

Procedure	Page
1-1 Accessing connectors in an OMX (Standard) tray	1-3
1-2 Accessing connectors in an OMX 4CH + Fiber Manager or OMX 4 CH Enhanced	1-8
1-3 Accessing connectors in an OMX 1CH CWDM	1-12
1-4 Accessing connectors in an OMX 4CH CWDM	1-15
1-5 Accessing connectors in an OMX 1CH OADM ITU CWDM	1-12
1-6 Accessing connectors in an OMX 4CH ITU CWDM or OMX 4CH OADM ITU CWDM	1-24
1-7 Accessing connectors in an OMX 8CH ITU CWDM	1-29
1-8 Accessing connectors in an OMX 16CH DWDM	1-33
1-9 Accessing connectors in an OSC tray	1-38
1-10 Accessing connectors in an ECT tray	1-43
1-11 Accessing connectors in a C&L splitter/coupler tray	1-46
1-12 Accessing connectors in a 1310 nm splitter/coupler tray	1-49
1-13 Accessing connectors in a Transponder Protection Tray	1-53
1-14 Accessing connectors in a PBE	1-58
1-15 Accessing connectors in a discrete VOA	1-62
1-16 Accessing connectors in a patch panel	1-66
1-17 Accessing connectors in a DSCM Tray	1-70

Procedure 1-1
Accessing connectors in an OMX (Standard) tray

Follow this procedure to access the connectors in an OMX (Standard) tray.

Requirements

Complete all of the procedures in the "Installing a rack (19-inch or 23-inch)" chapter, and "Installing an OMX (Standard) tray" in the "Installing Optical Metro 5200 shelves and equipment" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201, before you begin this procedure.

Table 1-3 lists the tools and materials required to complete the procedure.

Table 1-3
Required tools and materials

Item	Quantity	Supplied
Antistatic wrist and heel straps	1	no
Fiber-optic cleaning kit	1	no
Fiber inspection scope	1	no
Phillips #1 screwdriver	1	no

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
To ensure network reliability, clean the fiber connectors before you make connections.

—continued—

Procedure 1-1 (continued)
Accessing connectors in an OMX (Standard) tray

CAUTION
Risk of service interruption
Do not change the Band Rx, Band Tx, Band Drop, or Band Add connectors in the OMX. You can affect traffic at all shelves in the network with the same band. If you change these connectors, refer to the labels on the connectors before you connect them to the correct terminal in the OMX.

CAUTION
Risk of equipment damage
The lengths of the OMX monitor cables are fixed. The monitor cables cannot reach to the end of the OMX tray when the tray is extended. If you try to extend the tray without disconnecting the RJ-45 connectors, you can damage the cables.

CAUTION
Possible risk of damage to equipment and fiber
Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawer. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

—continued—

Procedure 1-1 (continued)
Accessing connectors in an OMX (Standard) tray

Action

Step	Action
1	Locate the shelf that houses the OMX (Standard).
2	If the grill of the cooling unit is not already removed, remove it by loosening the appropriate screws. Set the grill aside.
3	If the OMX tray is not pulled out to access the OMX modules, disconnect the RJ-45 connectors of the OMX monitor cable on both sides of the OMX tray.
4	Press and hold the front locking tabs on each side of the tray, then pull the tray out until it is fully extended and locks in the open position. See Figure 1-1 on page 1-6.
5	Remove the cover of the OMX module by removing the four screws that keep the cover in position and lifting the cover to the side. See Figure 1-2 on page 1-6. If necessary, repeat this for the other OMX module in the tray.
6	Locate the connector needed to make the necessary connection. See Figure 1-3 on page 1-7 for the connector labels in an OMX (Standard). For connection information, see the chapter “Connecting components”.
7	When connections are complete, secure the cover of the OMX module in position with screws making sure that the pigtails come out of the opening in the cover that is closest to the rack rail. If necessary, repeat this for the other OMX module in the tray. ***Note:*** The cover only fits one way. If necessary, turn the cover 180 degrees. Make sure that the back edge of the cover fits into the slot at the back of the module.
8	Slide the OMX tray into the shelf while pressing the locking tabs in the center of the sides of the OMX tray.
9	The front locking tabs will click when fully engaged.
10	Reconnect the RJ45 connectors of the OMX monitor cable on both sides of the OMX tray.
11	Attach the cooling unit grill. The grill covers the cooling unit and the OMX tray.

—end—

Figure 1-1
Releasing the front locking tabs on the tray

OM0130p

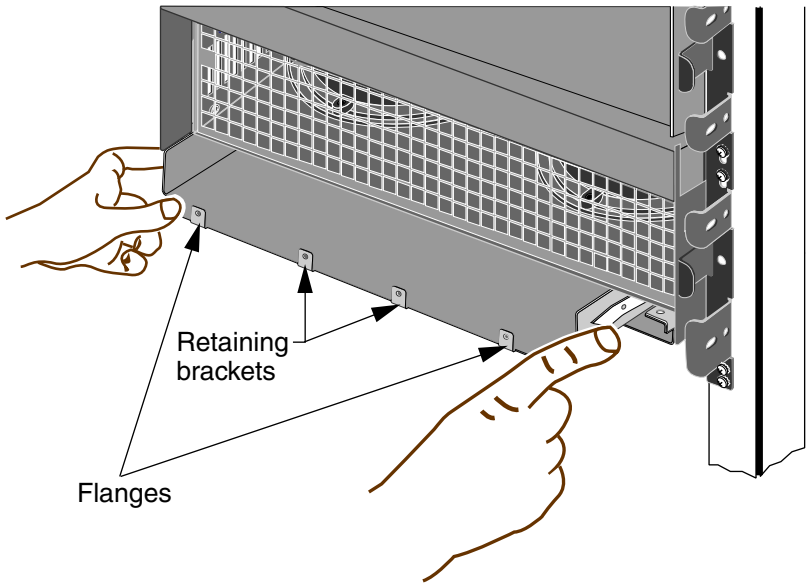


Figure 1-2
Removing the cover of an OMX module

OM0121p

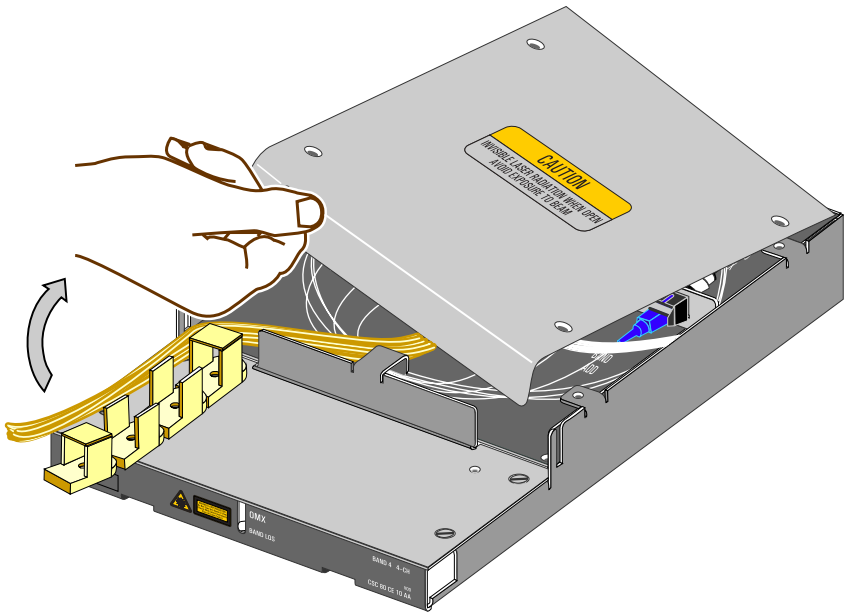
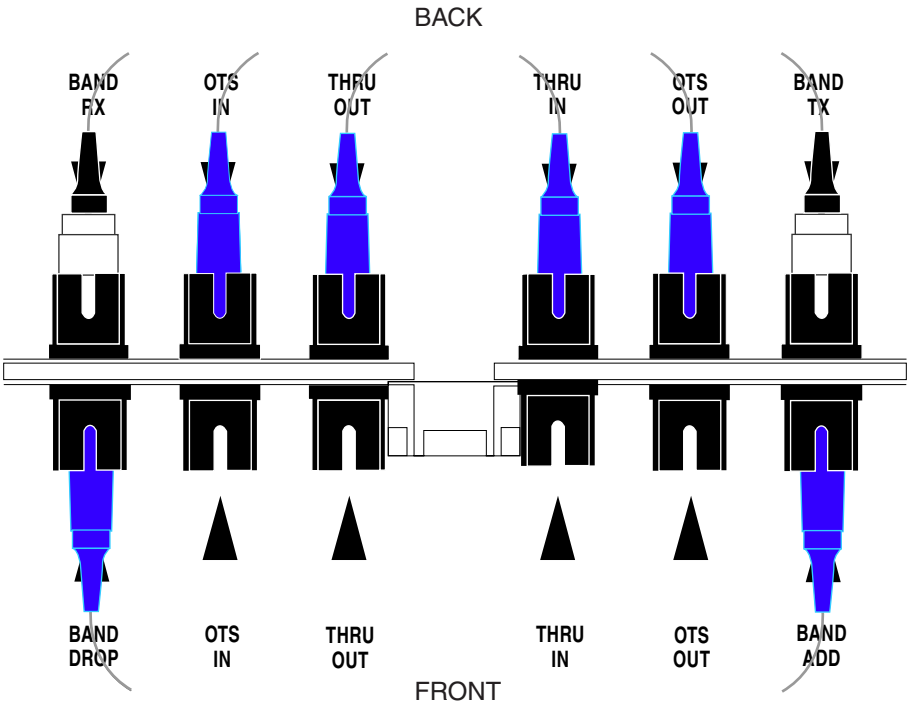


Figure 1-3
Connector labels in an OMX (Standard) tray

OM0119p



Procedure 1-2
Accessing connectors in an OMX 4CH + Fiber Manager or OMX 4 CH Enhanced

Follow this procedure to access the connectors in an OMX 4CH + Fiber Manager or OMX 4 CH Enhanced.

Requirements

Complete all of the procedures in the "Installing a rack (19-inch or 23-inch)" chapter, and "Installing and grounding equipment drawers" in the "Installing Optical Metro 5200 shelves and equipment" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201, before you begin this procedure.

Table 1-4 lists the tools and materials required to complete the procedure.

Table 1-4
Required tools and materials

Item	Quantity	Supplied
Antistatic wrist and heel straps	1	no
Fiber-optic cleaning kit	1	no
Fiber inspection scope	1	no

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
To ensure network reliability, clean the fiber connectors before you make connections.

—continued—

Procedure 1-2 (continued)
Accessing connectors in an OMX 4CH + Fiber Manager or OMX 4 CH Enhanced

CAUTION
Possible risk of damage to equipment and fiber
Make sure that the bulkhead connectors are lowered and snapped into place before closing the drawer. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawer. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

Action

Step	Action
1	Locate the OMX.
2	Open the OMX by pressing and holding the two locking latches on the drawer and pulling the drawer towards you until it is fully open.
3	Verify if the drawer has a locking clip and if the locking click is spring-loaded. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks into place.

If the drawer	**Then**
has a non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and then go to step 4
does not have a locking clip or the locking clip is spring-loaded	go to step 4

4	Locate the connector needed to make the necessary connection. See Figure 1-4 on page 1-10 for the connector labels in an OMX 4CH + Fiber Manager or OMX 4CH Enhanced.
5	Lift the pull-up tab on the top of the bulkhead to access the connector. See Figure 1-5 on page 1-11 for an example of the bulkhead and of how to access the connector. For connection information, see the chapter "Connecting components".
6	Lower the connector by pushing down on the tab at the top of the unit, until the bulkhead snaps into place.

—continued—

Procedure 1-2 (continued)
Accessing connectors in an OMX 4CH + Fiber Manager or OMX 4 CH Enhanced

Step	Action
7	Route the slack fiber around the fiber management components in the drawer.
8	Use curly ties or Velcro straps to bundle the fibers where they enter the drawer.
9	Make sure that you have lowered all the bulkheads and that the fibers are routed correctly around the fiber management components.

10	**If** the drawer has a	**Then**
	non-spring-loaded locking clip	return the locking clip to the original upright position
	spring-loaded locking clip	push the clip down

11	To close the drawer, press and hold the locking tabs on the drawer while you slide the drawer into the shelf. The locking tabs click into position when the drawer is in place.

—end—

Figure 1-4
Connector labels in an OMX 4CH + Fiber Manager or OMX 4 CH Enhanced

OM0700t

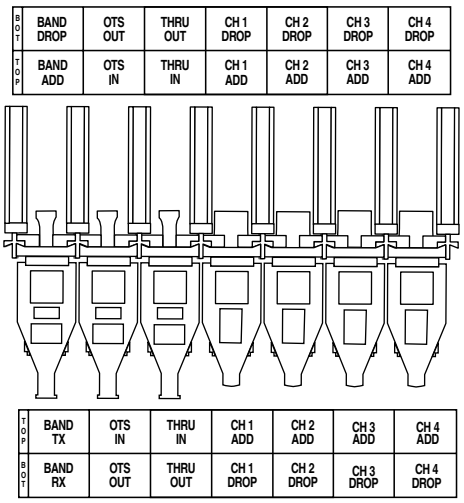
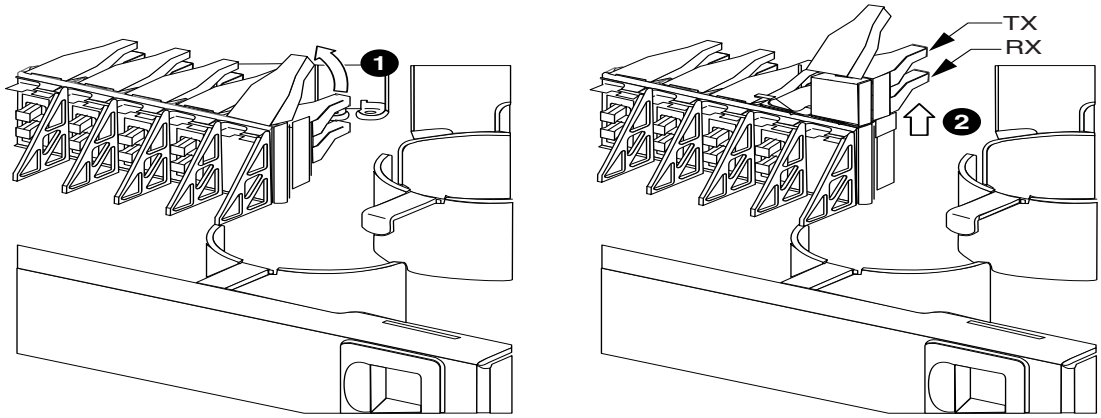


Figure 1-5
Example of connector bulkheads

OM0325p



Procedure 1-3
Accessing connectors in an OMX 1CH CWDM

Follow this procedure to access the connectors in an OMX 1CH CWDM.

Requirements

Complete all of the procedures in the "Installing a frame (19-inch or 23-inch)" chapter, and "Installing and grounding equipment drawers" in the "Installing Optical Metro 5100 shelves and equipment" chapter of *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, before you begin this procedure.

You must route patch cords that will connect to the Optical Metro 5100 shelf for the OMX 1CH CWDM through the right side of the drawer.

Table 1-5 lists the tools and materials required to complete the procedure.

Table 1-5
Required tools and materials

Item	Quantity	Supplied
Antistatic wrist and heel straps	1	no
Fiber-optic cleaning kit	1	no
Fiber inspection scope	1	no

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
To ensure network reliability, clean the fiber connectors before you make connections.

—continued—

Procedure 1-3 (continued)
Accessing connectors in an OMX 1CH CWDM

CAUTION
Possible risk of damage to equipment and fiber
Make sure that the bulkhead connectors are lowered and snapped into place before closing the drawer. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawer. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

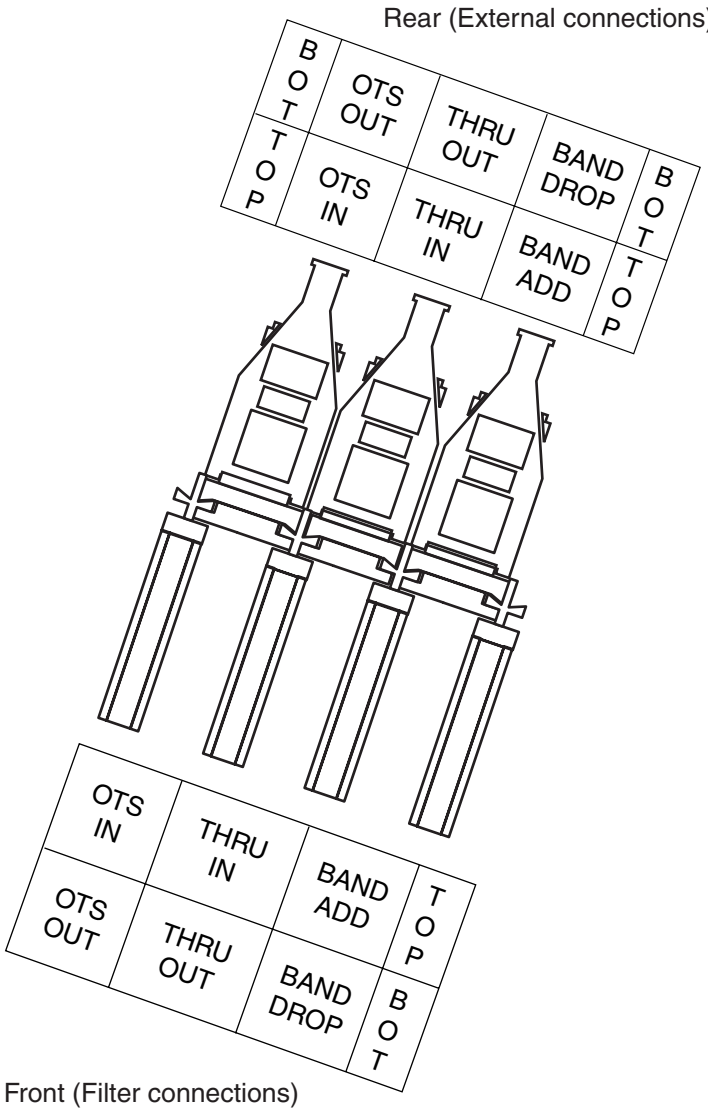
Action

Step	Action
1	Locate the OMX 1CH CWDM.
2	Open the OMX 1CH CWDM by pressing and holding the two locking latches on the drawer and pulling the drawer towards you until it is fully open.
3	Locate the connector needed to make the necessary connection. See Figure 1-6 on page 1-14 for the connector labels in the OMX 1CH CWDM.
4	Lift the pull-up tab on the top of the bulkhead to access the connector. See Figure 1-5 on page 1-11 for an example of the bulkhead and of how to access the connector. For connection information, see the chapter "Connecting components".
5	Lower the connector by pushing down on the tab at the top of the unit, until the bulkhead snaps into place.
6	Route the slack fiber around the fiber management components in the drawer.
7	Use curly ties or Velcro straps to bundle the fibers where they enter the drawer.
8	Make sure that you have lowered all the bulkheads and that the fibers are routed correctly around the fiber management components.
9	To close the drawer, press and hold the locking tabs on the drawer while you slide the drawer into the shelf. The locking tabs click into position when the drawer is in place.

—end—

Figure 1-6
Connector labels in an OMX 1CH CWDM

OM0898t



Procedure 1-4
Accessing connectors in an OMX 4CH CWDM

Follow this procedure to access the connectors in an OMX 4CH CWDM.

Requirements

Before you begin this procedure, complete all of the procedures in the "Installing a frame (19-inch or 23-inch)" chapter of *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, or the "Installing a rack (19-inch or 23-inch)" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Before you begin this procedure, complete either "Installing and grounding equipment drawers" in the "Installing Optical Metro 5100 shelves and equipment" chapter of *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, or, "Installing and grounding equipment drawers" in the "Installing Optical Metro 5200 shelves and equipment" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Table 1-6 lists the tools and materials required to complete the procedure.

Table 1-6
Required tools and materials

Item	Quantity	Supplied
Antistatic wrist and heel straps	1	no
Fiber-optic cleaning kit	1	no
Fiber inspection scope	1	no

—continued—

Procedure 1-4 (continued)
Accessing connectors in an OMX 4CH CWDM

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
To ensure network reliability, clean the fiber connectors before you make connections.

CAUTION
Possible risk of damage to equipment and fiber
Make sure that the bulkhead connectors are lowered and snapped into place before closing the drawer. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawer. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

—continued—

Procedure 1-4 (continued)
Accessing connectors in an OMX 4CH CWDM

Action

Step	Action	
1	Locate the OMX 4CH CWDM.	
2	**If** you want to access	**Then**
	the OTS IN MONITOR and OTS OUT MONITOR ports on an OMX 4CH CWDM with dual taps	you do not need to open the drawer. The OTS IN MONITOR and OTS OUT MONITOR ports are accessible from the front of the OMX drawer. Remove connector dust caps to make the necessary connection.
	for all other optical ports	go to step 3
3	Open the OMX 4CH CWDM by pressing and holding the two locking latches on the drawer and pulling the drawer towards you until it is fully open.	
4	Locate the connector needed to make the necessary connection. See Figure 1-7 on page 1-18 for the connector labels in a C-band OMX 4CH CWDM. See Figure 1-8 on page 1-19 for the connector labels in an L-band OMX 4CH CWDM.	
5	Lift the pull-up tab on the top of the bulkhead to access the connector. See Figure 1-5 on page 1-11 for an example of the bulkhead and of how to access the connector. For connection information, see the chapter "Connecting components".	
6	Lower the connector by pushing down on the tab at the top of the unit, until the bulkhead snaps into place.	
7	Route the slack fiber around the fiber management components in the drawer.	
8	Use curly ties or Velcro straps to bundle the fibers where they enter the drawer.	
9	Make sure that you have lowered all the bulkheads and that the fibers are routed correctly around the fiber management components.	
10	To close the drawer, press and hold the locking tabs on the drawer while you slide the drawer into the shelf. The locking tabs click into position when the drawer is in place.	

—end—

Figure 1-7
Connector labels in a C-band OMX 4CH CWDM

OM0899t

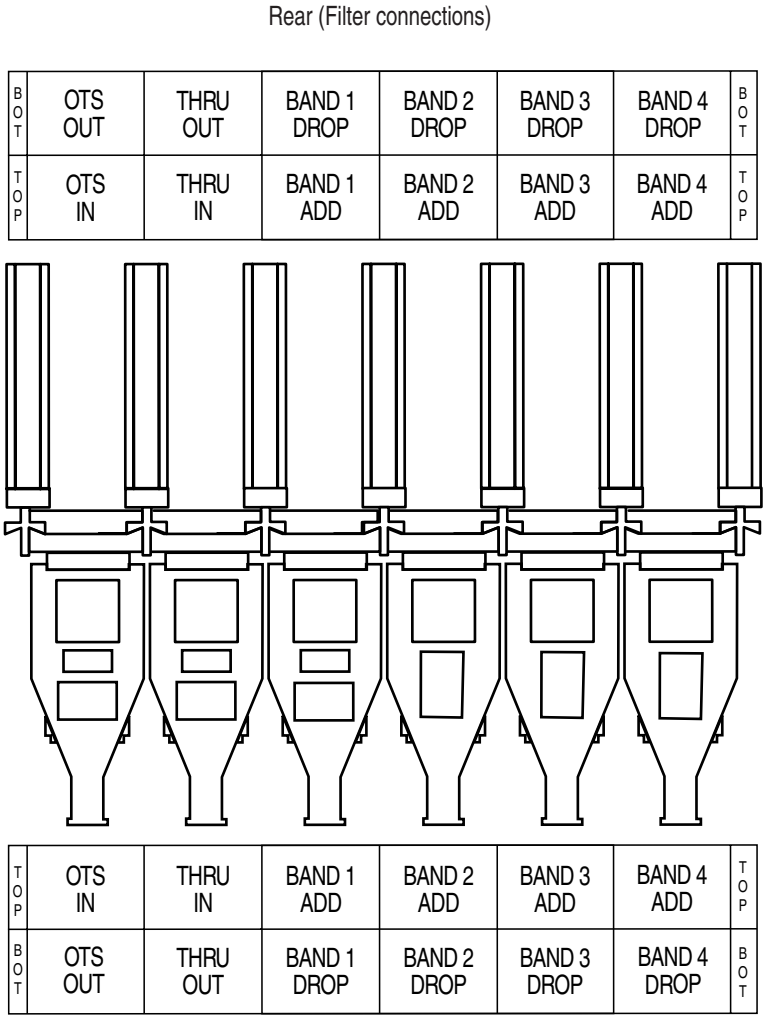
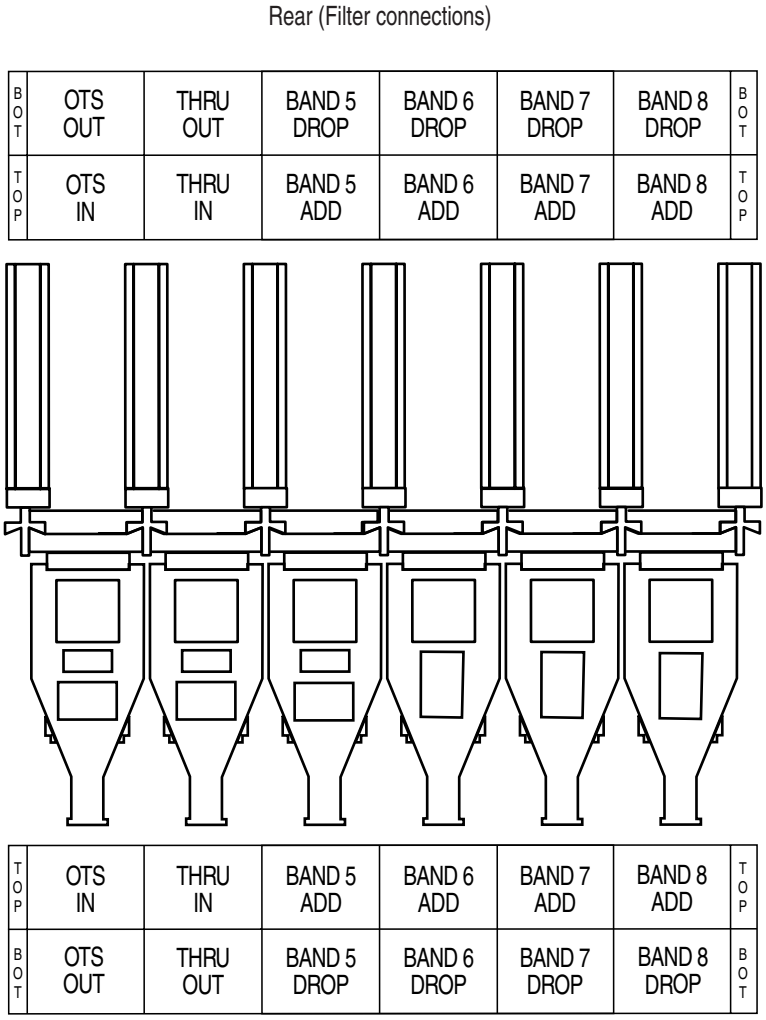


Figure 1-8
Connector labels in an L-band OMX 4CH CWDM

OM0900t



Procedure 1-5
Accessing connectors in an OMX 1CH OADM ITU CWDM

Follow this procedure to access the connectors in an OMX 1CH OADM ITU CWDM.

Requirements

Before you begin this procedure, complete all of the procedures in the "Installing a frame (19-inch or 23-inch)" chapter of *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, or the "Installing a rack (19-inch or 23-inch)" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Before you begin this procedure, complete either "Installing and grounding equipment drawers" in the "Installing Optical Metro 5100 shelves and equipment" chapter of *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, or, "Installing and grounding equipment drawers" in the "Installing Optical Metro 5200 shelves and equipment" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Table 1-7 lists the tools and materials required to complete the procedure.

Table 1-7
Required tools and materials

Item	Quantity	Supplied
Antistatic wrist and heel straps	1	no
Fiber-optic cleaning kit	1	no
Fiber inspection scope	1	no

—continued—

Procedure 1-5 (continued)
Accessing connectors in an OMX 1CH OADM ITU CWDM

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
To ensure network reliability, clean the fiber connectors before you make connections.

CAUTION
Possible risk of damage to equipment and fiber
Make sure that the bulkhead connectors are lowered and snapped into place before closing the drawer. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawer. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

—continued—

Procedure 1-5 (continued)
Accessing connectors in an OMX 1CH OADM ITU CWDM

Action

Step	Action
1	Locate the OMX 1CH OADM ITU CWDM.
2	Open the OMX 1CH OADM ITU CWDM by pressing and holding the two locking latches on the drawer and pulling the drawer towards you until it is fully open.
3	Verify if the drawer has a spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and then go to step 4
spring-loaded locking clip	go to step 4

4	Locate the connector needed to make the necessary connection. See Figure 1-9 on page 1-23 for the connector labels in an OMX 1CH OADM ITU CWDM.
5	Lift the pull-up tab on the top of the bulkhead to access the connector. See Figure 1-5 on page 1-11 for an example of the bulkhead and of how to access the connector. For connection information, see the chapter "Connecting components".
6	Lower the connector by pushing down on the tab at the top of the unit, until the bulkhead snaps into place.
7	Route the slack fiber around the fiber management components in the drawer.
8	Use curly ties or Velcro straps to bundle the fibers where they enter the drawer.
9	Make sure that you have lowered all the bulkheads and that the fibers are routed correctly around the fiber management components.
10	**If** the drawer has a … **Then** …

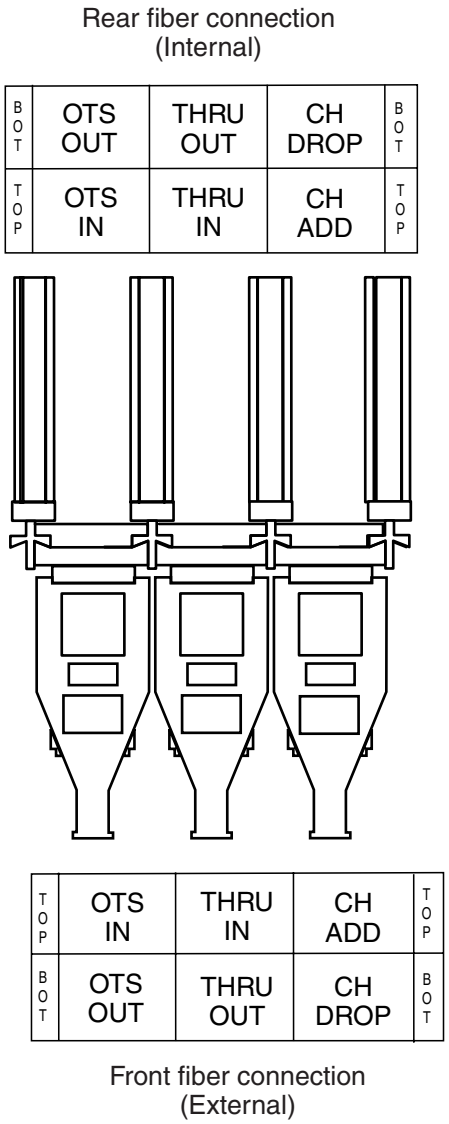
If the drawer has a	**Then**
non-spring-loaded locking clip	return the locking clip to the original upright position
spring-loaded locking clip	push the clip down

11	To close the drawer, press and hold the locking tabs on the drawer while you slide the drawer into the shelf. The locking tabs click into position when the drawer is in place.

—end—

Figure 1-9
Connector labels in an OMX 1CH OADM ITU CWDM

om2595p



Procedure 1-6
Accessing connectors in an OMX 4CH ITU CWDM or OMX 4CH OADM ITU CWDM

Follow this procedure to access the connectors in an

- OMX 4CH ITU CWDM
- OMX 4CH OADM ITU CWDM

Requirements

Before you begin this procedure, complete all of the procedures in the "Installing a frame (19-inch or 23-inch)" chapter of *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, or the "Installing a rack (19-inch or 23-inch)" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Before you begin this procedure, complete either "Installing and grounding equipment drawers" in the "Installing Optical Metro 5100 shelves and equipment" chapter of *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, or, "Installing and grounding equipment drawers" in the "Installing Optical Metro 5200 shelves and equipment" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Table 1-8 lists the tools and materials required to complete the procedure.

Table 1-8
Required tools and materials

Item	Quantity	Supplied
Antistatic wrist and heel straps	1	no
Fiber-optic cleaning kit	1	no
Fiber inspection scope	1	no

—continued—

Procedure 1-6 (continued)
Accessing connectors in an OMX 4CH ITU CWDM or OMX 4CH OADM ITU CWDM

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
To ensure network reliability, clean the fiber connectors before you make connections.

CAUTION
Possible risk of damage to equipment and fiber
Make sure that the bulkhead connectors are lowered and snapped into place before closing the drawer. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawer. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

—continued—

Procedure 1-6 (continued)
Accessing connectors in an OMX 4CH ITU CWDM or OMX 4CH OADM ITU CWDM

Action

Step	Action
1	Locate the OMX 4CH ITU CWDM or the OMX 4CH OADM ITU CWDM.
2	Open the OMX 4CH ITU CWDM or the OMX 4CH OADM ITU CWDM by pressing and holding the two locking latches on the drawer and pulling the drawer towards you until it is fully open.
3	Verify if the drawer has a spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and then go to step 4
spring-loaded locking clip	go to step 4

4	Locate the connector needed to make the necessary connection. See Figure 1-10 on page 1-27 for the connector labels in an OMX 4CH ITU CWDM or Figure 1-11 on page 1-28 for the connector labels in an OMX 4CH OADM ITU CWDM.
5	Lift the pull-up tab on the top of the bulkhead to access the connector. See Figure 1-5 on page 1-11 for an example of the bulkhead and of how to access the connector. For connection information, see the chapter "Connecting components".
6	Lower the connector by pushing down on the tab at the top of the unit, until the bulkhead snaps into place.
7	Route the slack fiber around the fiber management components in the drawer.
8	Use curly ties or Velcro straps to bundle the fibers where they enter the drawer.
9	Make sure that you have lowered all the bulkheads and that the fibers are routed correctly around the fiber management components.

10	**If** the drawer has a	**Then**
	non-spring-loaded locking clip	return the locking clip to the original upright position
	spring-loaded locking clip	push the clip down

11	To close the drawer, press and hold the locking tabs on the drawer while you slide the drawer into the shelf. The locking tabs click into position when the drawer is in place.

—end—

Figure 1-10
Connector labels in an OMX 4CH ITU CWDM

OM1956t

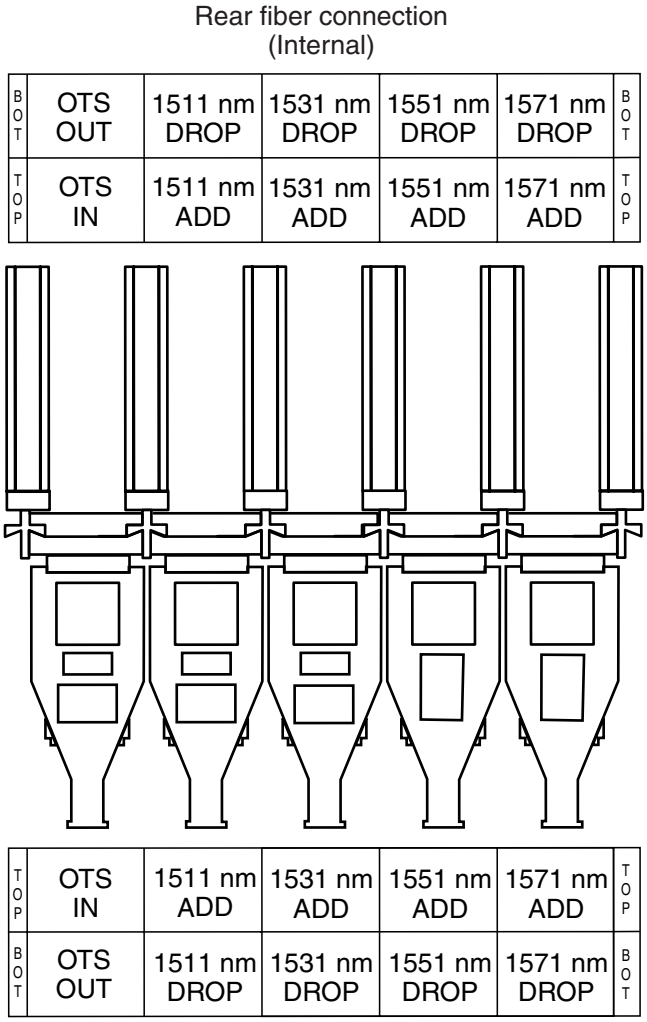
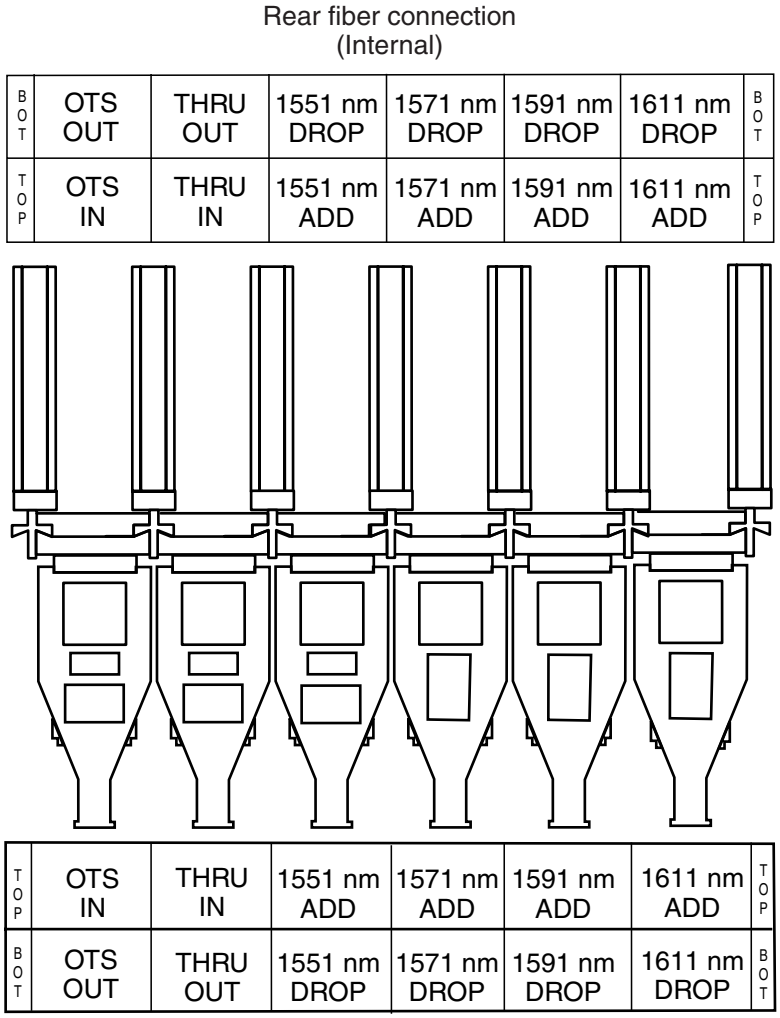


Figure 1-11
Connector labels in an OMX 4CH OADM ITU CWDM

om2596p



Procedure 1-7
Accessing connectors in an OMX 8CH ITU CWDM

Follow this procedure to access the connectors in an OMX 8CH ITU CWDM.

Requirements

Before you begin this procedure, complete all of the procedures in the "Installing a frame (19-inch or 23-inch)" chapter of *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, or the "Installing a rack (19-inch or 23-inch)" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Before you begin this procedure, complete either "Installing and grounding equipment drawers" in the "Installing Optical Metro 5100 shelves and equipment" chapter of *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, or, "Installing and grounding equipment drawers" in the "Installing Optical Metro 5200 shelves and equipment" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Table 1-9 lists the tools and materials required to complete the procedure.

Table 1-9
Required tools and materials

Item	Quantity	Supplied
Antistatic wrist and heel straps	1	no
Fiber-optic cleaning kit	1	no
Fiber inspection scope	1	no

—continued—

Procedure 1-7 (continued)
Accessing connectors in an OMX 8CH ITU CWDM

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
To ensure network reliability, clean the fiber connectors before you make connections.

CAUTION
Possible risk of damage to equipment and fiber
Make sure that the bulkhead connectors are lowered and snapped into place before closing the drawer. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawer. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

—continued—

Procedure 1-7 (continued)
Accessing connectors in an OMX 8CH ITU CWDM

Action

Step	Action
1	Locate the OMX 8CH ITU CWDM.
2	Open the OMX 8CH ITU CWDM by pressing and holding the two locking latches on the drawer and pulling the drawer towards you until it is fully open.
3	Verify if the drawer has a spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and then go to step 4
spring-loaded locking clip	go to step 4

4	Locate the connector needed to make the necessary connection. See Figure 1-12 on page 1-32 for the connector labels in an OMX 8CH ITU CWDM.
5	Lift the pull-up tab on the top of the bulkhead to access the connector. See Figure 1-5 on page 1-11 for an example of the bulkhead and of how to access the connector. For connection information, see the chapter "Connecting components".
6	Lower the connector by pushing down on the tab at the top of the unit, until the bulkhead snaps into place.
7	Route the slack fiber around the fiber management components in the drawer.
8	Use curly ties or Velcro straps to bundle the fibers where they enter the drawer.
9	Make sure that you have lowered all the bulkheads and that the fibers are routed correctly around the fiber management components.
10	**If** the drawer has a … **Then** …

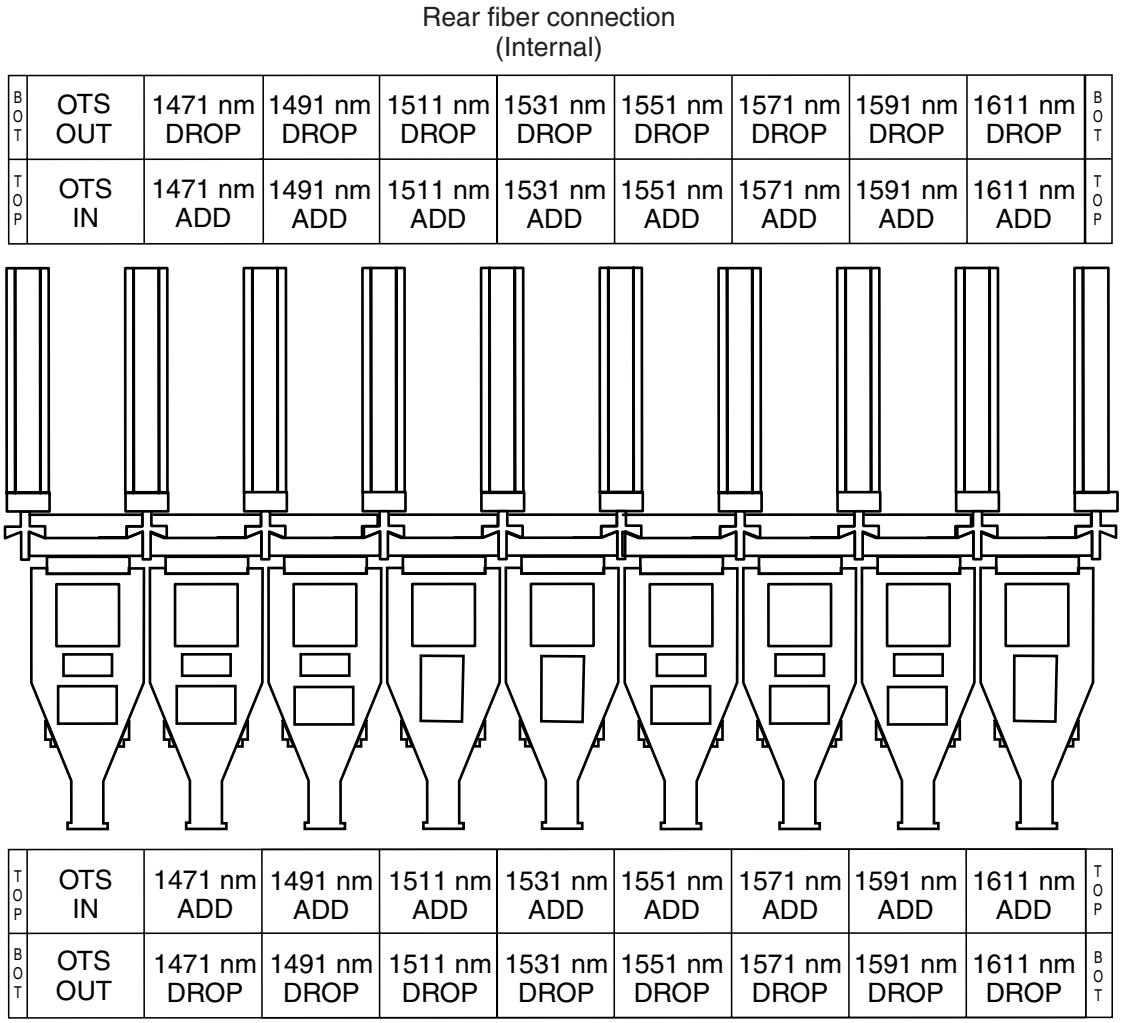
If the drawer has a	**Then**
non-spring-loaded locking clip	return the locking clip to the original upright position
spring-loaded locking clip	push the clip down

11	To close the drawer, press and hold the locking tabs on the drawer while you slide the drawer into the shelf. The locking tabs click into position when the drawer is in place.

—end—

Figure 1-12
Connector labels in an OMX 8CH ITU CWDM

OM1957t



Procedure 1-8
Accessing connectors in an OMX 16CH DWDM

Follow this procedure to access the connectors in an OMX 16CH DWDM.

Requirements

Before you begin this procedure, complete all of the procedures in the "Installing a frame (19-inch or 23-inch)" chapter of *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, or the "Installing a rack (19-inch or 23-inch)" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Before you begin this procedure, complete either "Installing and grounding equipment drawers" in the "Installing Optical Metro 5100 shelves and equipment" chapter of *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, or, "Installing and grounding equipment drawers" in the "Installing Optical Metro 5200 shelves and equipment" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Table 1-10 lists the tools and materials required to complete the procedure.

Table 1-10
Required tools and materials

Item	Quantity	Supplied
Antistatic wrist and heel straps	1	no
Fiber-optic cleaning kit	1	no
Fiber inspection scope	1	no
Phillips # 2 screwdriver	1	no

—continued—

Procedure 1-8 (continued)
Accessing connectors in an OMX 16CH DWDM

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
To ensure network reliability, clean the fiber connectors before you make connections.

CAUTION
Risk of damage to equipment
When the gray slider adapter is extended to the furthest outward position and an SC or LC connector is inserted into the SC or LC coupling, the slider adapter can separate at the seams due to the pressure being applied.

Firmly support the slider adapter when inserting an SC or LC connector to avoid equipment damage.

CAUTION
Risk of damage to equipment and fiber
Make sure that the sliders are pushed fully to the rear before closing the front cover. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawer. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

—continued—

Procedure 1-8 (continued)
Accessing connectors in an OMX 16CH DWDM

Action

Step	Action
1	Locate the OMX 16CH DWDM.
2	Using a Phillips #2 screwdriver, open the front cover of the OMX 16CH DWDM by turning the screws counterclockwise, see Figure 1-13 on page 1-36.
3	Locate the required sliding adapter. ***Note 1:*** See Figure 1-14 on page 1-36 for the connector labels in an OMX 16CH DWDM C-band. ***Note 2:*** See Figure 1-15 on page 1-36 for the connector labels in an OMX 16CH DWDM L-band.
4	Pull the sliding adapter out, see Figure 1-16 on page 1-37.
5	Remove the connector dust cover.
6	Carefully insert the optical fiber connector into the sliding adapter. For connection information, see the chapter "Connecting components". *A click indicates that you have inserted the optical fiber connector correctly.*
7	Push the sliding adapter in.
8	Move any slack fiber so that you can close the OMX 16CH DWDM door.
9	Use curly ties or Velcro straps to bundle the fibers close to the entry point of the Fiber Manager. See Guidelines for routing fiber in the Fiber Manager, in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.
10	Close the front cover of the OMX 16CH DWDM by turning the screws (clockwise).
11	Perform fiber management, see Guidelines for routing fiber in the Fiber Manager, in *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

—end—

Figure 1-13
OMX 16CH DWDM

OM2555p

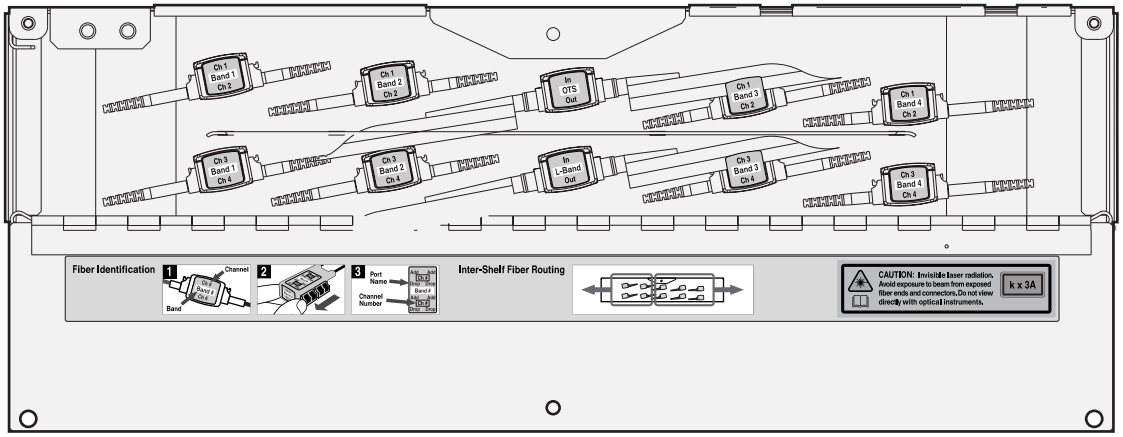


Figure 1-14
Labels for OMX 16CH DWDM C-band

OM2545p

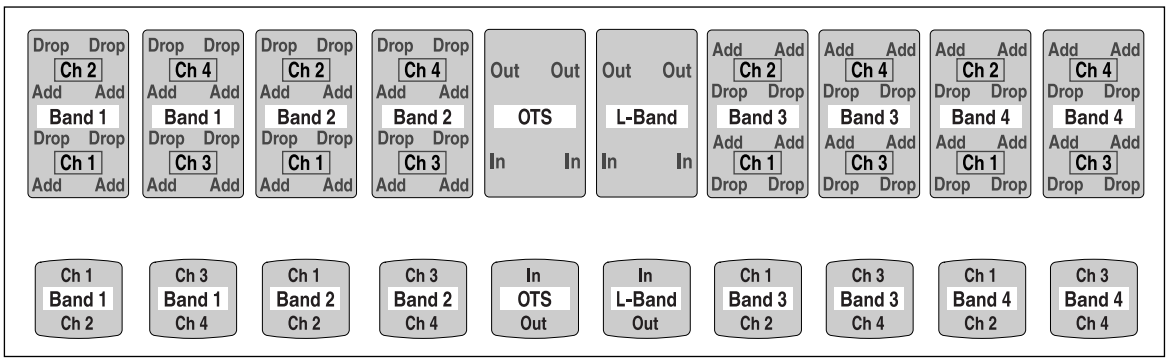


Figure 1-15
Labels for OMX 16CH DWDM L-band

OM2546p

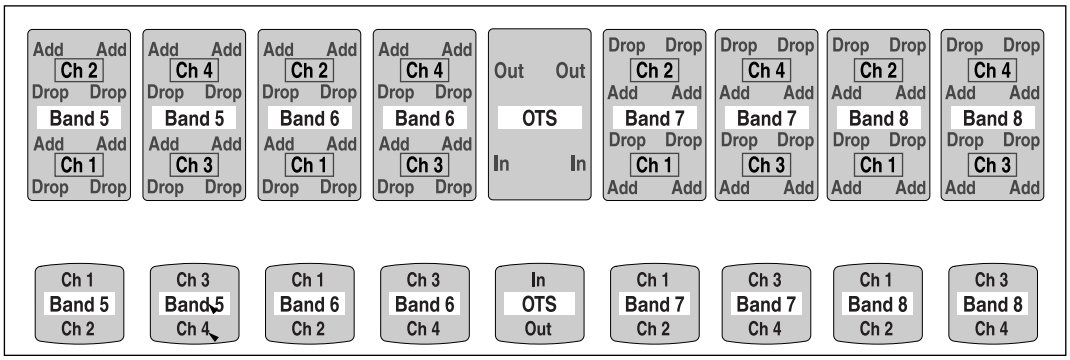
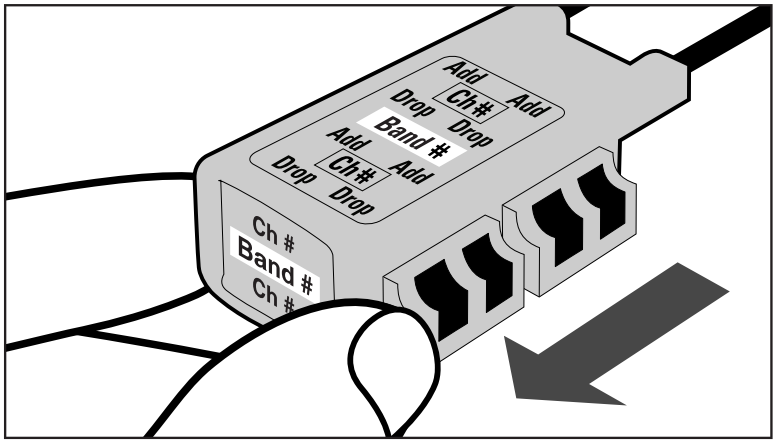


Figure 1-16
Using the slider adapter

OM2547p



Procedure 1-9
Accessing connectors in an OSC tray

Follow this procedure to access connectors of an OSC tray.

Requirements

Before you begin this procedure, complete all of the procedures in the "Installing a frame (19-inch or 23-inch)" chapter of *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, or the "Installing a rack (19-inch or 23-inch)" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Before you begin this procedure, complete either "Installing and grounding equipment drawers" in the "Installing Optical Metro 5100 shelves and equipment" chapter of *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, or, "Installing and grounding equipment drawers" in the "Installing Optical Metro 5200 shelves and equipment" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Table 1-11 lists the tools and materials required to complete the procedure.

Table 1-11
Required tools and materials

Item	Quantity	Supplied
Antistatic wrist and heel straps	1	no
Fiber-optic cleaning kit	1	no
Fiber inspection scope	1	no

—continued—

Procedure 1-9 (continued)
Accessing connectors in an OSC tray

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
To ensure network reliability, clean the fiber connectors before you make connections.

CAUTION
Make sure that the bulkhead connectors are lowered and snapped into place before closing the drawer. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawer. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

—continued—

Procedure 1-9 (continued)
Accessing connectors in an OSC tray

Action

Step	Action	
1	Locate the OSC drawer.	
2	**If** you want to access	**Then**
	the OTS IN MONITOR and OTS OUT MONITOR ports on an OSC with dual taps	You do not need to open the drawer. The OTS IN MONITOR and OTS OUT MONITOR ports are accessible from the front of the OSC drawer. Remove connector dust caps to make the necessary connection.
	for all other optical ports	go to step 3
3	Open the OSC drawer by pressing and holding the two locking latches on the drawer and pulling the drawer towards you until it is fully open.	
4	Verify if the drawer has a locking clip and if the locking click is spring-loaded. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks into place.	
	If the drawer	**Then**
	has a non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and then go to step 5
	does not have a locking clip or the locking clip is spring-loaded	go to step 5
5	Locate the east or west OSC module as required. Locate the connector needed to make the necessary connection. See Figure 1-17 on page 1-41 for the connector labels in an OSC tray (without dual taps). See Figure 1-18 on page 1-42 for the connector labels in an OSC tray (with dual taps)	
6	Lift the pull-up tab on the top of the bulkhead to access the connector. See Figure 1-5 on page 1-11 for an example of the bulkhead and of how to access the connector. For connection information, see the chapter “Connecting components”.	
7	Lower the connector by pushing down on the tab at the top of the unit, until the bulkhead snaps into place.	
8	Route the slack fiber around the fiber management components in the drawer.	
9	Use curly ties or Velcro straps to bundle the fibers where they enter the drawer.	

—continued—

Procedure 1-9 (continued)
Accessing connectors in an OSC tray

Step	Action	
10	Make sure that you have lowered all the bulkheads and that the fibers are routed correctly around the fiber management components.	
11	**If** the drawer has a	**Then**
	non-spring-loaded locking clip	return the locking clip to the original upright position
	spring-loaded locking clip	push the clip down
12	To close the drawer, press and hold the locking tabs on the drawer while you slide the drawer into the shelf. The locking tabs click into position when the drawer is in place.	

—end—

Figure 1-17
Connector labels in an OSC tray (without faceplate accessible power monitoring ports)

OM0553t

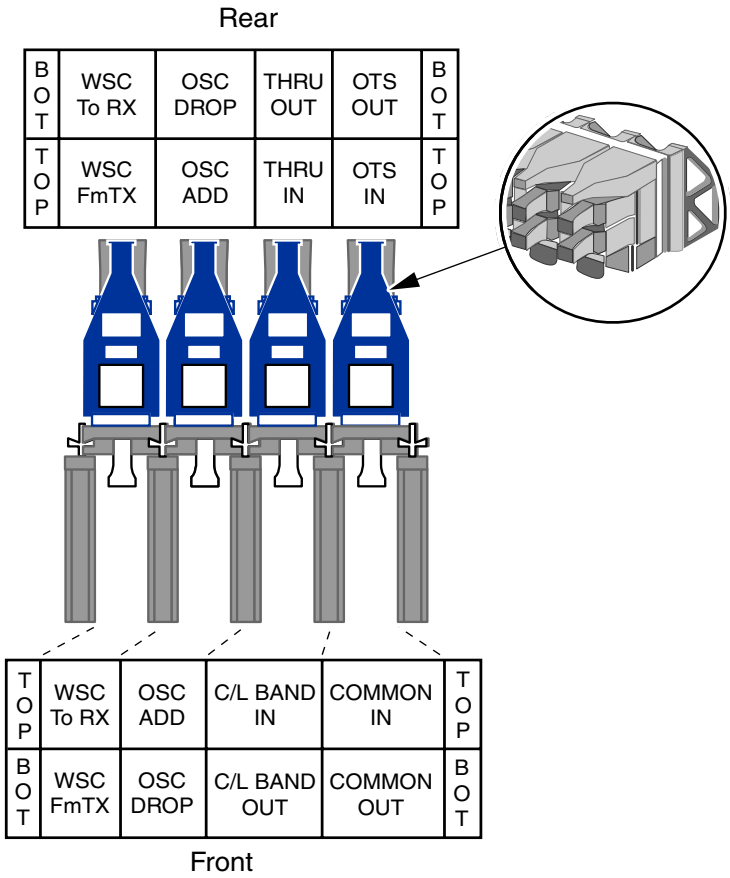
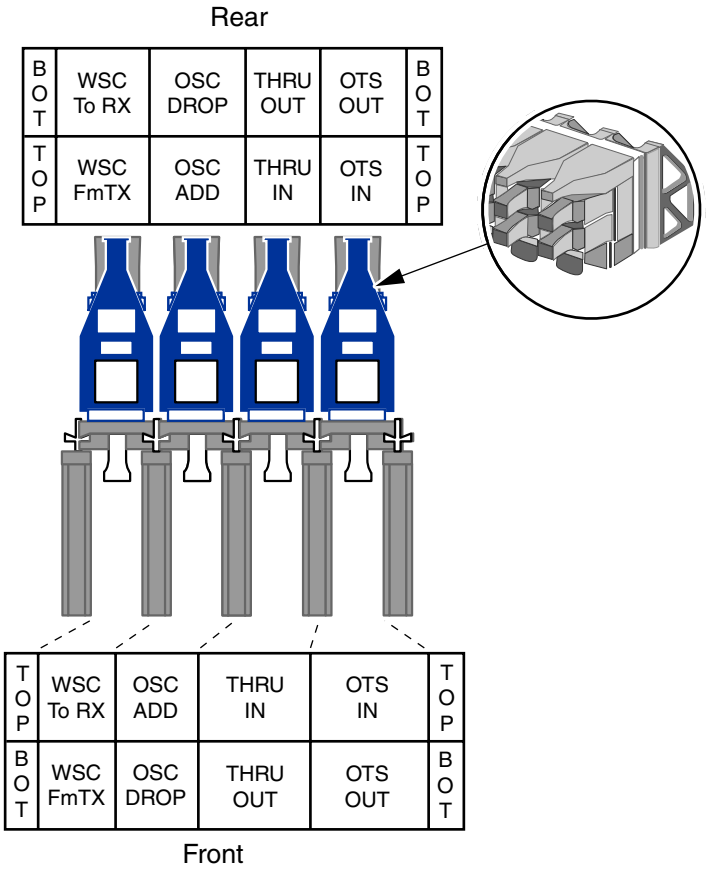


Figure 1-18
Connector labels in an OSC tray (with dual taps)

OM2600t



Procedure 1-10
Accessing connectors in an ECT tray

Follow this procedure to access connectors in an ECT tray.

Requirements

Complete all of the procedures in the "Installing a rack (19-inch or 23-inch)" chapter, and "Installing an ECT tray in a drawer" in the "Installing Optical Metro 5200 shelves and equipment" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201, before you begin this procedure.

Table 1-12 lists the tools and materials required to complete the procedure.

Table 1-12
Required tools and materials

Item	Quantity	Supplied
Antistatic wrist and heel straps	1	no
Fiber-optic cleaning kit	1	no
Fiber inspection scope	1	no
Flathead screwdriver	1	no

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
To ensure network reliability, clean the fiber connectors before you make connections.

—continued—

Procedure 1-10 (continued)
Accessing connectors in an ECT tray

CAUTION
Possible risk of damage to equipment and fiber
Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawer. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

Action

Step	Action
1	Locate the shelf that houses the ECT tray.
2	If the grill of the cooling unit is not already removed, remove it by loosening the appropriate screws. Set the grill aside.
3	Remove the RJ-45 connector from the ECT monitor port.
4	Press and hold the front locking tabs on each side of the tray, then pull the tray out until it is fully extended. See Figure 1-19 on page 1-45.
5	Loosen the screws that secure the access door on the top left side of the ECT, then open the door.
6	Locate the connector needed to make the necessary connection. See Figure 1-20 on page 1-45 for the connector labels in an ECT tray. For connection information, see the chapter "Connecting components".
7	Close the access door on top of the ECT and secure it with screws.
8	Replace the tabs at each end and on every third link of the flexible fiber guide.
9	Insert the end of the flexible fiber guide into the fiber guide parking bracket.
10	Press the locking tabs on the sides of the tray and slide the tray into the shelf. The locking tabs click into position when the tray is in place.
11	Insert the RJ-45 connector into the ECT monitor port.
12	Attach the cooling unit grill. The grill covers the cooling unit and the ECT tray.

—end—

Figure 1-19
Releasing the front locking tabs on the tray

CAP0459p

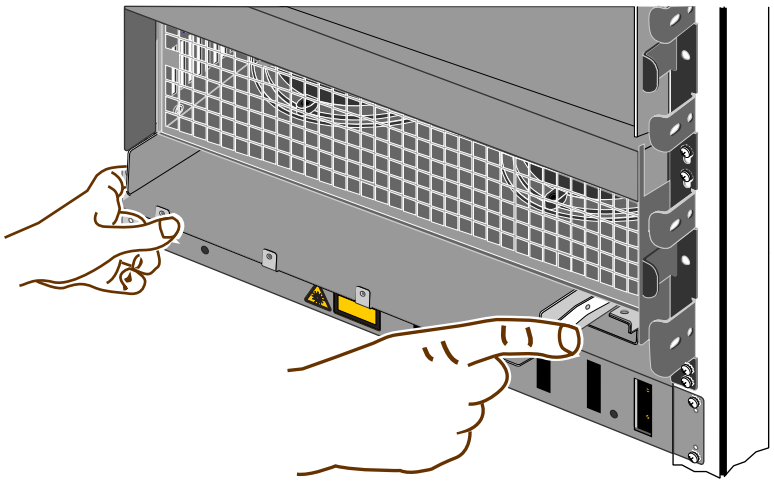
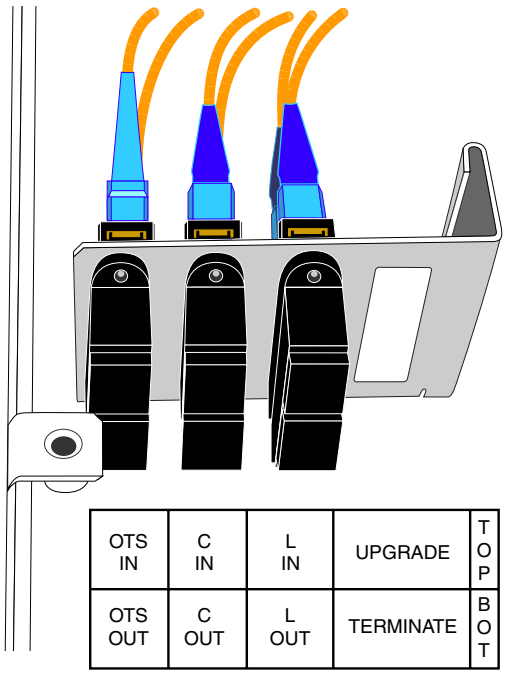


Figure 1-20
Connector labels in an ECT tray

OM0099p



Procedure 1-11
Accessing connectors in a C&L splitter/coupler tray

Follow this procedure to access connectors in a C&L splitter/coupler tray.

Requirements

Complete all of the procedures in the "Installing a rack (19-inch or 23-inch)" chapter, and "Installing and grounding equipment drawers" in the "Installing Optical Metro 5200 shelves and equipment" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201, before you begin this procedure.

Table 1-13 lists the tools and materials required to complete the procedure.

Table 1-13
Required tools and materials

Item	Quantity	Supplied
Antistatic wrist and heel straps	1	no
Fiber-optic cleaning kit	1	no
Fiber inspection scope	1	no

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
To ensure network reliability, clean the fiber connectors before you make connections.

—continued—

Procedure 1-11 (continued)
Accessing connectors in a C&L splitter/coupler tray

CAUTION
Possible risk of damage to equipment and fiber
Make sure that the bulkhead connectors are lowered and snapped into place before closing the drawer. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawer. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

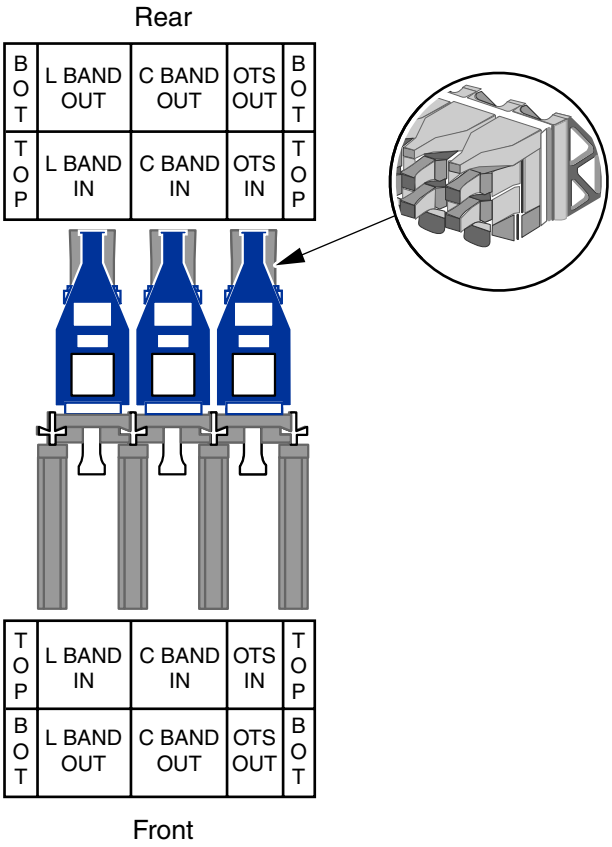
Action

Step	Action
1	Locate the C&L splitter/coupler drawer.
2	Open the C&L splitter/coupler drawer by pressing and holding the two locking latches on the drawer and pulling the drawer towards you until it is fully open.
3	Locate the connector needed to make the necessary connection. See Figure 1-21 on page 1-48 for the connector labels in a C&L splitter/coupler tray. For connection information, see the chapter "Connecting components".
4	Lift the pull-up tab on the top of the bulkhead to access the connector. See Figure 1-5 on page 1-11 for an example of the bulkhead and of how to access the connector.
5	Lower the connector by pushing down on the tab at the top of the unit, until the bulkhead snaps into place.
6	Route the slack fiber around the fiber management components in the drawer.
7	Use curly ties or Velcro straps to bundle the fibers where they enter the drawer.
8	Make sure that you have lowered all the bulkheads and that the fibers are routed correctly around the fiber management components.
9	To close the drawer, press and hold the locking tabs on the drawer while you slide the drawer into the shelf. The locking tabs click into position when the drawer is in place.

—end—

Figure 1-21
Connector labels in a C&L splitter/coupler tray

OM0735t



Procedure 1-12
Accessing connectors in a 1310 nm splitter/coupler tray

Follow this procedure to access the connectors in a 1310 nm splitter/coupler tray.

Requirements

Before you begin this procedure, complete all of the procedures in the "Installing a frame (19-inch or 23-inch)" chapter of *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, or the "Installing a rack (19-inch or 23-inch)" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Before you begin this procedure, complete either "Installing and grounding equipment drawers" in the "Installing Optical Metro 5100 shelves and equipment" chapter of *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, or, "Installing and grounding equipment drawers" in the "Installing Optical Metro 5200 shelves and equipment" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Table 1-14 lists the tools and materials required to complete the procedure.

Table 1-14
Required tools and materials

Item	Quantity	Supplied
Antistatic wrist and heel straps	1	no
Fiber-optic cleaning kit	1	no
Fiber inspection scope	1	no

—continued—

Procedure 1-12 (continued)
Accessing connectors in a 1310 nm splitter/coupler tray

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
To ensure network reliability, clean the fiber connectors before you make connections.

CAUTION
Possible risk of damage to equipment and fiber
Make sure that the bulkhead connectors are lowered and snapped into place before closing the drawer. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawer. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

—continued—

Procedure 1-12 (continued)
Accessing connectors in a 1310 nm splitter/coupler tray

Action

Step	Action
1	Locate the 1310 nm splitter/coupler drawer.
2	Open the 1310 nm splitter/coupler drawer by pressing and holding the two locking latches on the drawer and pulling the drawer towards you until it is fully open.
3	Verify if the drawer has a spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and then go to step 4
spring-loaded locking clip	go to step 4

4	Locate the connector needed to make the necessary connection. See Figure 1-22 on page 1-52 for the connector labels in the 1310 nm splitter/coupler.
5	Lift the pull-up tab on the top of the bulkhead to access the connector. See Figure 1-5 on page 1-11 for an example of the bulkhead and of how to access the connector. For connection information, see the chapter "Connecting components".
6	Lower the connector by pushing down on the tab at the top of the unit, until the bulkhead snaps into place.
7	Route the slack fiber around the fiber management components in the drawer.
8	Use curly ties or Velcro straps to bundle the fibers where they enter the drawer.
9	Make sure that you have lowered all the bulkheads and that the fibers are routed correctly around the fiber management components on both trays.

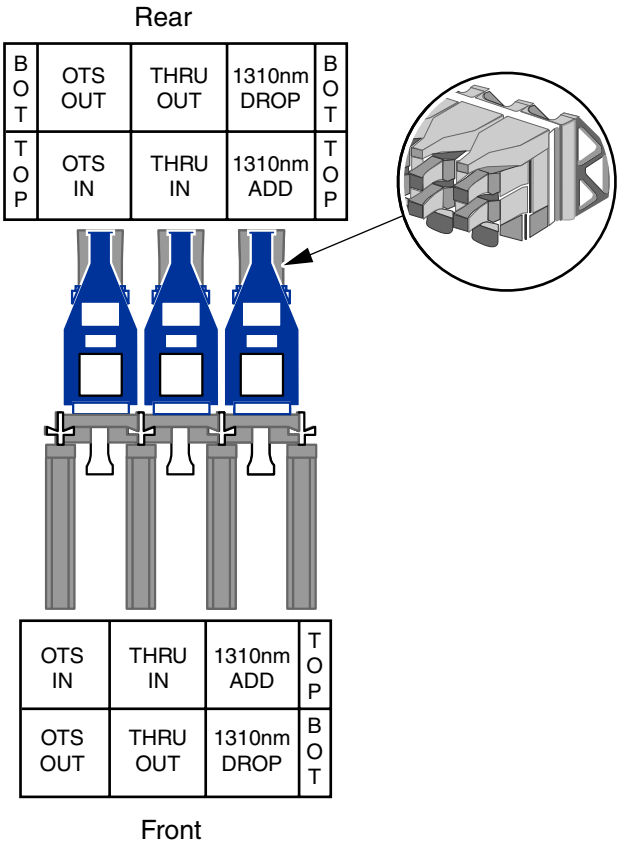
10	**If** the drawer has a	**Then**
	non-spring-loaded locking clip	return the locking clip to the original upright position
	spring-loaded locking clip	push the clip down

11	To close the drawer, press and hold the locking tabs on the drawer while you slide the drawer into the shelf. The locking tabs click into position when the drawer is in place.

—end—

Figure 1-22
Connector labels in a 1310 nm splitter/coupler

OM2076t



Procedure 1-13
Accessing connectors in a Transponder Protection Tray

Follow this procedure to access the connectors in a Transponder Protection Tray.

Requirements

Before you begin this procedure, complete all of the procedures in the "Installing a frame (19-inch or 23-inch)" chapter of *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, or the "Installing a rack (19-inch or 23-inch)" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Before you begin this procedure, complete either "Installing and grounding equipment drawers" in the "Installing Optical Metro 5100 shelves and equipment" chapter of *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, or, "Installing and grounding equipment drawers" in the "Installing Optical Metro 5200 shelves and equipment" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Table 1-15 lists the tools and materials required to complete the procedure.

Table 1-15
Required tools and materials

Item	Quantity	Supplied
Antistatic wrist and heel straps	1	no
Fiber-optic cleaning kit	1	no
Fiber inspection scope	1	no

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

—continued—

Procedure 1-13 (continued)
Accessing connectors in a Transponder Protection Tray

CAUTION
Possible risk of damage to equipment and fiber
Make sure that the bulkhead connectors are lowered and snapped into place before closing the drawer. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawer. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

CAUTION
Risk of affecting network reliability
To ensure network reliability, clean the fiber connectors before you make connections.

ATTENTION
The Transponder Protection Tray has two sliding fiber management components located on the left and right sides of the tray. Each of these components has two tabs that lock into position across the top of the dish, to hold the routed fibers in position.

To open the tab to route fiber through the dish, press the tab toward the back of the latch while you lift it. Press down on the tab to close it.

—continued—

Procedure 1-13 (continued)
Accessing connectors in a Transponder Protection Tray

Action

Step	Action
1	Locate the Transponder Protection drawer.
2	Open the Transponder Protection drawer by pressing and holding the two locking latches located on the sides of the tray, and pulling it toward you until the tray is fully extended.
3	Locate the connector to use to make the connection. See Figure 1-23 on page 1-56 for the connector labels in the four-channel Transponder Protection Tray. See Figure 1-24 on page 1-57 for the connector labels in the two-channel Transponder Protection Tray.
4	Lift the pull-up tab on the top of the bulkhead to access the tributary-side connectors. See Figure 1-5 on page 1-11 for an example of the bulkhead and of how to access the connector. For connection information, see the chapter "Connecting components".
5	Lower the connector by pushing down on the tab on top of the unit, until the bulkhead snaps into place.
6	Route the slack fiber around the fiber management components in the drawer. ***Note:*** To route fiber through the component located at the side of the drawer where the fibers enter or exit, press the tab toward the back of the latch while lifting it. Press down on the tab to close it.
7	Use curly ties or Velcro straps to bundle the fibers where they enter the tray.
8	Make sure that you have lowered all the bulkheads and that the fibers are routed correctly around the fiber management components.
9	To close the tray, press and hold the locking tabs on the sides of the tray while you slide the tray into the shelf. The locking tabs click into position when the tray is in place.

—end—

Figure 1-23
Connector labels in a four-channel Transponder Protection Tray

OM1800p

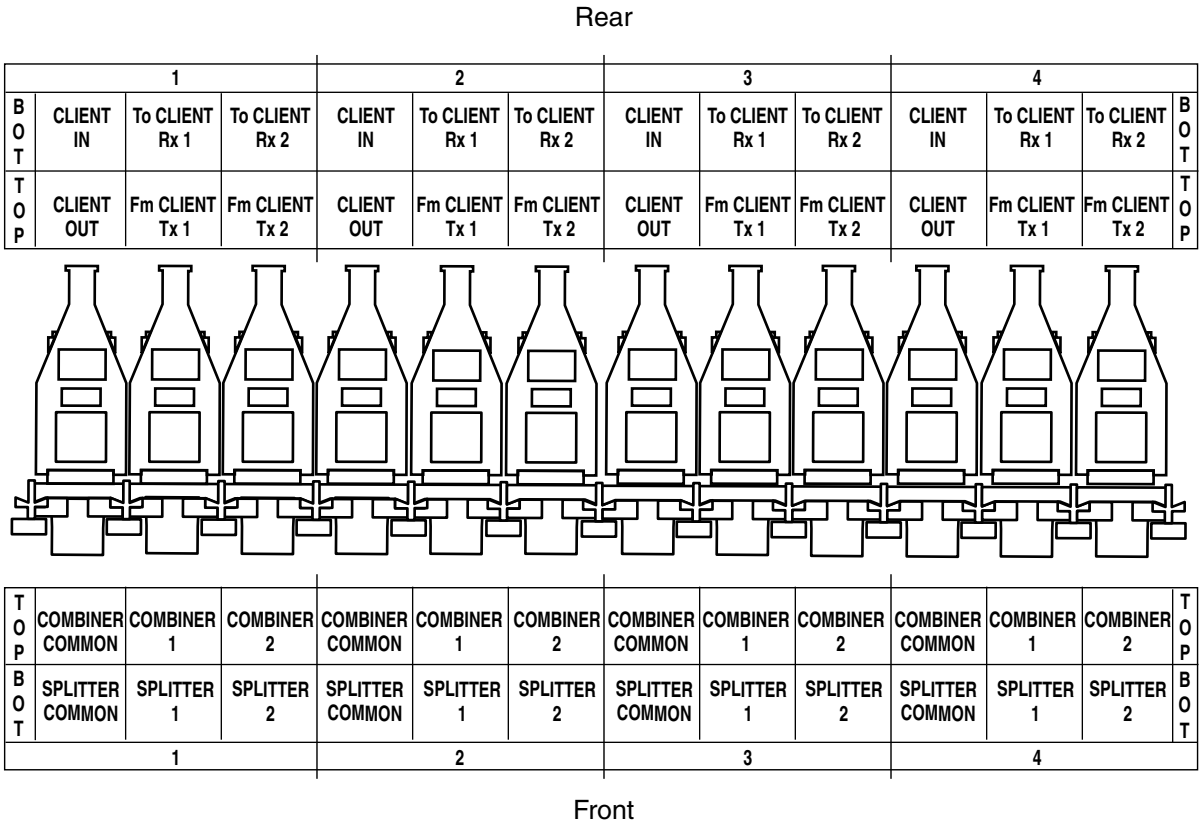
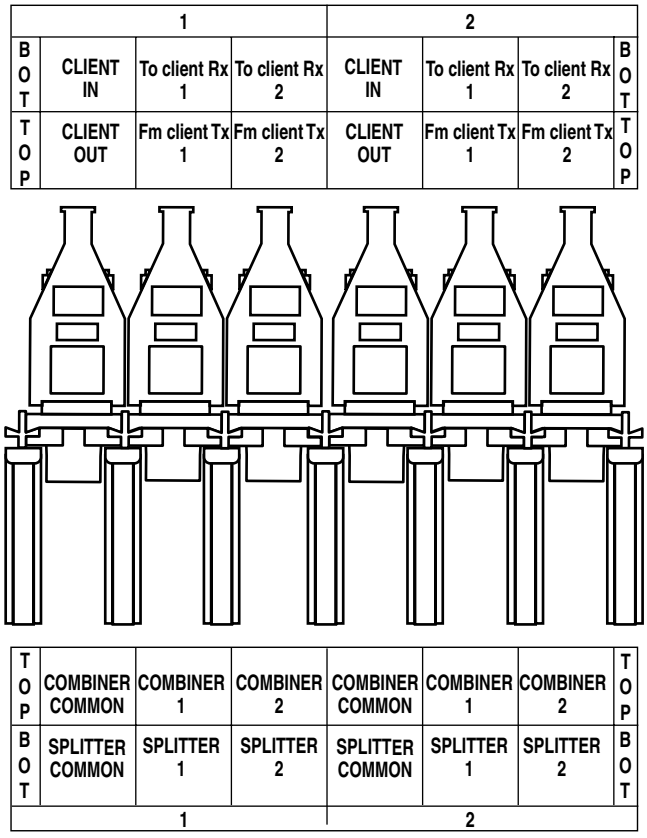


Figure 1-24
Connector labels in a two-channel Transponder Protection Tray

OM1218p

Rear



Front

Procedure 1-14
Accessing connectors in a PBE

Follow this procedure to access the connectors in a Per Band Equalizer (PBE).

Requirements

Complete all of the procedures in the "Installing a rack (19-inch or 23-inch)" chapter, and "Installing and grounding equipment drawers" in the "Installing Optical Metro 5200 shelves and equipment" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201, before you begin this procedure.

Table 1-16 lists the tools and materials required to complete the procedure.

Table 1-16
Required tools and materials

Item	Quantity	Supplied
Antistatic wrist and heel straps	1	no
Fiber-optic cleaning kit	1	no
Fiber inspection scope	1	no

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
To ensure network reliability, clean the fiber connectors before you make connections.

—continued—

Procedure 1-14 (continued)
Accessing connectors in a PBE

CAUTION
Possible risk of damage to equipment and fiber
Make sure that the bulkhead connectors are lowered and snapped into place before closing the drawer. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 in. (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawer. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

ATTENTION
The PBE has two sliding fiber management components located on the left and right sides of the drawer. Each of these components has two tabs that lock into position across the top of the dish, to hold the routed fibers in position.

To open the tab to route fiber through the dish, press the tab toward the back of the latch while you lift it. Press down on the tab to close it.

Action

Step	Action
1	Locate the PBE drawer.
2	Open the PBE drawer by pressing and holding the two locking latches located on the sides of the drawer, and pulling it toward you until the drawer is fully extended.
3	Locate the connector needed to make the necessary connection. See Figure 1-25 on page 1-61 for the connector labels in a PBE.
4	Lift the pull-up tab on the top of the bulkhead to access the connector. See Figure 1-5 on page 1-11 for an example of the bulkhead and of how to access the connector. For connection information, see the chapter “Connecting components”.

—continued—

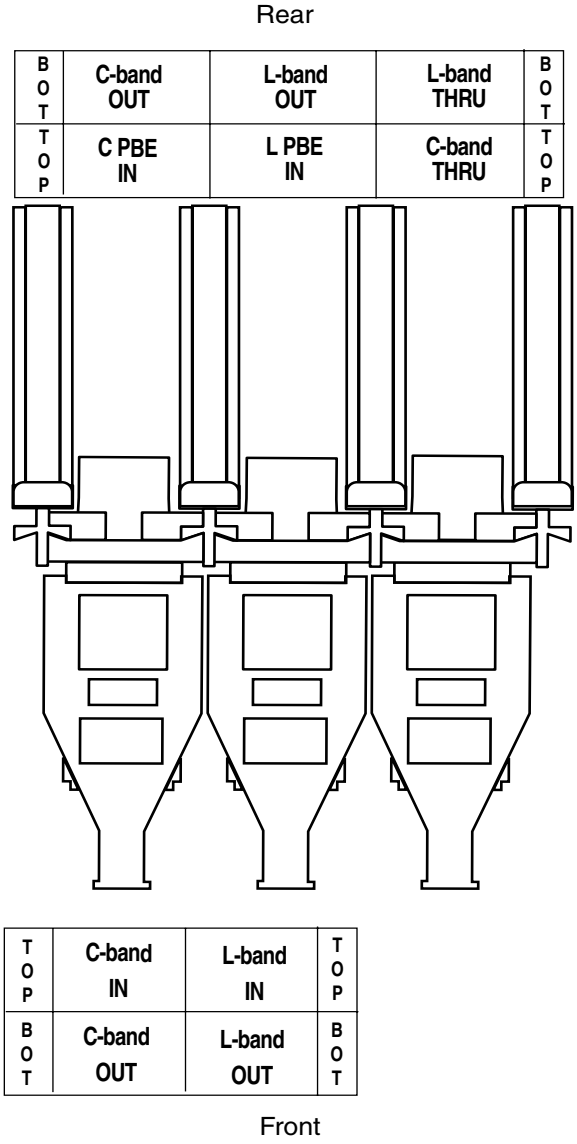
Procedure 1-14 (continued)
Accessing connectors in a PBE

Step	Action
5	Lower the connector by pushing down on the tab on top of the unit, until the bulkhead snaps into place.
6	Route the slack fiber around the fiber management components in the drawer. ***Note:*** To route fiber through the component located at the side of the drawer where the fibers enter or exit, press the tab toward the back of the latch while lifting it. Press down on the tab to close it.
7	Use curly ties or Velcro straps to bundle the fibers where they enter the tray.
8	Make sure that you have lowered all the bulkheads and that the fibers are routed correctly around the fiber management components.
9	To close the drawer, press and hold the locking tabs on the sides of the drawer while you slide the drawer into the shelf. The locking tabs click into position when the drawer is in place.

—end—

Figure 1-25
Connector labels in a PBE drawer

OM1216t



Procedure 1-15
Accessing connectors in a discrete VOA

Follow this procedure to access the connectors in a discrete variable optical attenuator (VOA).

Requirements

Complete all of the procedures in the "Installing a rack (19-inch or 23-inch)" chapter, and "Installing and grounding equipment drawers" in the "Installing Optical Metro 5200 shelves and equipment" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201, before you begin this procedure.

Table 1-17 lists the tools and materials required to complete the procedure.

Table 1-17
Required tools and materials

Item	Quantity	Supplied
Antistatic wrist and heel straps	1	no
Fiber-optic cleaning kit	1	no
Fiber inspection scope	1	no

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
To ensure network reliability, clean the fiber connectors before you make connections.

—continued—

Procedure 1-15 (continued)
Accessing connectors in a discrete VOA

CAUTION
Possible risk of damage to equipment and fiber
Make sure that the bulkhead connectors are lowered and snapped into place before closing the drawer. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 in. (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawer. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

Action

Step	Action
1	Locate the discrete VOA drawer.
2	Open the discrete VOA drawer by pressing and holding the two locking latches located on the sides of the drawer, and pulling it toward you until the drawer is fully extended.
3	Verify if the drawer has a spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and then go to step 4
spring-loaded locking clip	go to step 4

4	Locate the connector needed to make the necessary connection. See Figure 1-26 on page 1-65 for the connector labels in a discrete VOA.
5	Lift the pull-up tab on the top of the bulkhead to access the connector. See Figure 1-5 on page 1-11 for an example of the bulkhead and of how to access the connector. For connection information, see the chapter "Connecting components".

—continued—

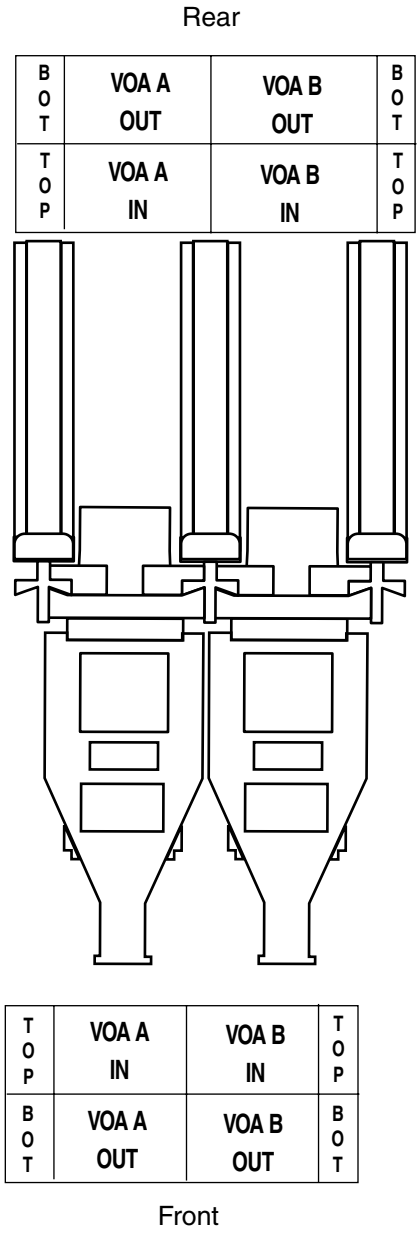
Procedure 1-15 (continued)
Accessing connectors in a discrete VOA

Step	Action
6	Lower the connector by pushing down on the tab on top of the unit, until the bulkhead snaps into place.
7	Route the slack fiber around the fiber management components in the drawer. ***Note:*** To route fiber through the component located at the side of the drawer where the fibers enter or exit, press the tab toward the back of the latch while lifting it. Press down on the tab to close it.
8	Use curly ties or Velcro straps to bundle the fibers where they enter the tray.
9	Make sure that you have lowered all the bulkheads and that the fibers are routed correctly around the fiber management components.
10	**If** the drawer has a — **Then** non-spring-loaded locking clip — return the locking clip to the original upright position spring-loaded locking clip — push the clip down
11	To close the drawer, press and hold the locking tabs on the sides of the drawer while you slide the drawer into the shelf. The locking tabs click into position when the drawer is in place.

—end—

Figure 1-26
Connector labels in a discrete VOA drawer

OM2317



Procedure 1-16
Accessing connectors in a patch panel

Follow this procedure to access the connectors in patch panel.

Requirements

Before you begin this procedure, complete all of the procedures in the "Installing a frame (19-inch or 23-inch)" chapter of *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, or the "Installing a rack (19-inch or 23-inch)" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Before you begin this procedure, complete either "Installing and grounding equipment drawers" in the "Installing Optical Metro 5100 shelves and equipment" chapter of *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, or, "Installing and grounding equipment drawers" in the "Installing Optical Metro 5200 shelves and equipment" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Table 1-18 lists the tools and materials required to complete the procedure.

Table 1-18
Required tools and materials

Item	Quantity	Supplied
Antistatic wrist and heel straps	1	no
Fiber-optic cleaning kit	1	no
Fiber inspection scope	1	no

—continued—

Procedure 1-16 (continued)
Accessing connectors in a patch panel

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
To ensure network reliability, clean the fiber connectors before you make connections.

CAUTION
Possible risk of damage to equipment and fiber
Make sure that the bulkhead connectors are lowered and snapped into place before closing the drawer. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawer. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

—continued—

Procedure 1-16 (continued)
Accessing connectors in a patch panel

Action

Step	Action
1	Locate the patch panel.
2	Open the patch panel by pressing and holding the two locking latches located on the patch panel, and pulling it toward you until the patch panel is fully extended.
3	Locate the connector needed to make the necessary connection. See Figure 1-27 and Figure 1-28 on page 1-69 for the connector labels in a patch panel.
4	Lift the pull-up tab on the top of the bulkhead to access the connector. See Figure 1-5 on page 1-11 for an example of the bulkhead and of how to access the connector. For connection information, see the chapter "Connecting components".
5	Lower the connector by pushing down on the tab on top of the unit, until the bulkhead snaps into place.
6	Route the slack fiber around the fiber management components in the drawer.
7	Use curly ties or Velcro straps to bundle the fibers where they enter the tray.
8	Make sure that you have lowered all the bulkheads and that the fibers are routed correctly around the fiber management components.
9	To close the patch panel, press and hold the locking tabs on the sides of the patch panel while you slide it into the shelf. The locking tabs click into position when the patch panel is in place.

—end—

Figure 1-27
Connector labels in a 16-port patch panel (NT0H43CA)

OM1215p

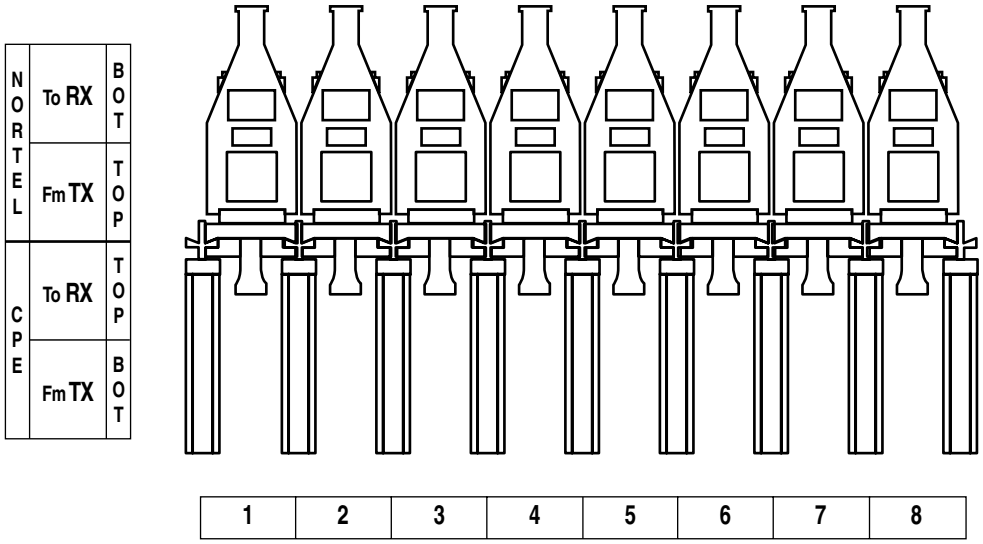
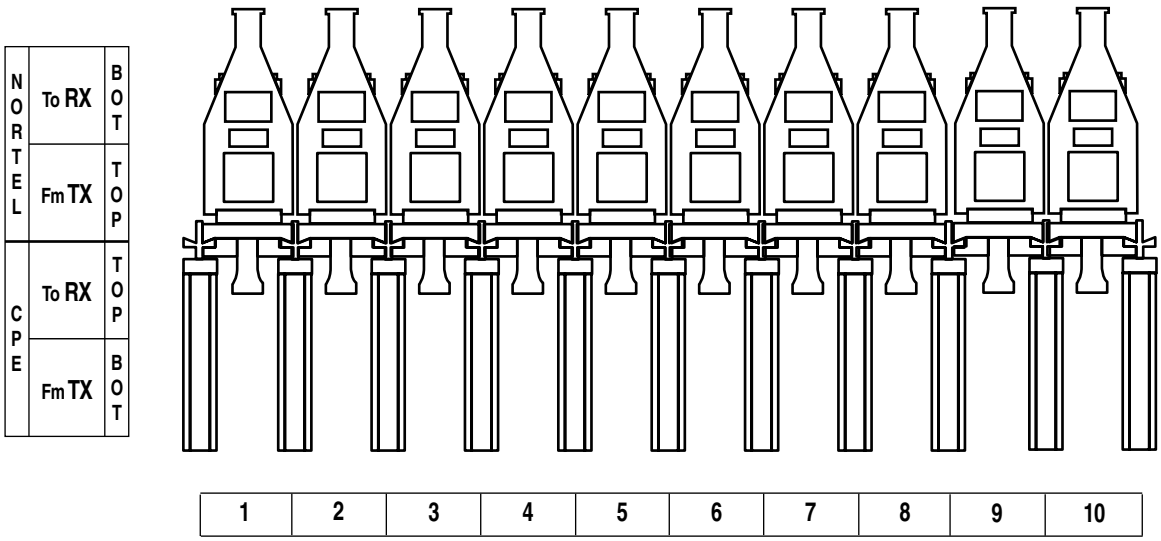


Figure 1-28
Connector labels in a 20-port patch panel (NT0H43CB)

om2799



Procedure 1-17
Accessing connectors in a DSCM Tray

Follow this procedure to access the connectors in a DSCM Tray drawer.

Requirements

Before you begin this procedure, complete all of the procedures in the "Installing a frame (19-inch or 23-inch)" chapter of *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, or the "Installing a rack (19-inch or 23-inch)" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Before you begin this procedure, complete either "Installing and grounding equipment drawers" in the "Installing Optical Metro 5100 shelves and equipment" chapter of *Installing Optical Metro 5100 Shelves and Components*, 323-1701-210, or, "Installing and grounding equipment drawers" in the "Installing Optical Metro 5200 shelves and equipment" chapter of *Installing Optical Metro 5200 Shelves and Components*, 323-1701-201.

Table 1-19 lists the tools and materials required to complete the procedure.

Table 1-19
Required tools and materials

Item	Quantity	Supplied
Antistatic wrist and heel straps	1	no
Fiber-optic cleaning kit	1	no
Fiber inspection scope	1	no

—continued—

Procedure 1-17 (continued)
Accessing connectors in a DSCM Tray

Precautions

DANGER
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
To ensure network reliability, clean the fiber connectors before you make connections.

CAUTION
Possible risk of damage to equipment and fiber
Observe the minimum bend radius of 1.18 in. (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawer. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

—continued—

Procedure 1-17 (continued)
Accessing connectors in a DSCM Tray

Action

Step	Action
1	Locate the DSCM drawer.
2	Open the DSCM drawer by pressing and holding the two locking latches located on the sides of the drawer, and pulling it toward you until the drawer is fully extended.
3	Verify if the drawer has a spring-loaded locking clip. The locking clip is located in the back left corner of the drawer. A spring-loaded clip automatically clicks into place.

If the drawer has a	**Then**
non-spring-loaded locking clip	lock the drawer open by rotating the locking clip counter-clockwise until it rests on the edge of the drawer and then go to step 4
spring-loaded locking clip	go to step 4

4	Locate the connector needed to make the necessary connection. See Figure 1-29 for the connectors and connector location in a DSCM Tray.
5	Make the required connections. See the chapter "Connecting components".
6	Route the slack fiber around the fiber management components in the drawer. ***Note:*** To route fiber through the component located at the side of the drawer where the fibers enter or exit, press the tab toward the back of the latch while lifting it. Press down on the tab to close it.
7	Use curly ties or Velcro straps to bundle the fibers where they enter the tray.
8	Make sure that the fibers are routed correctly around the fiber management components.

9	**If** the drawer has a	**Then**
	non-spring-loaded locking clip	return the locking clip to the original upright position
	spring-loaded locking clip	push the clip down

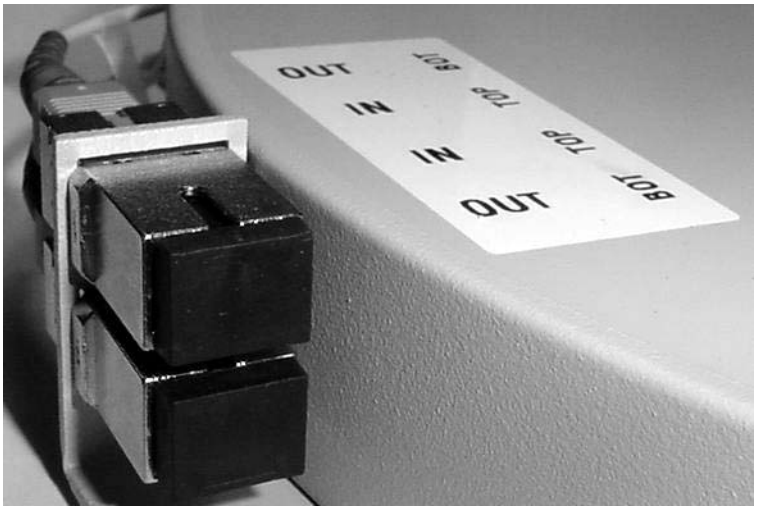
10	To close the drawer, press and hold the locking tabs on the sides of the drawer while you slide the drawer into the shelf. The locking tabs click into position when the drawer is in place.

—end—

Procedure 1-17 (continued)
Accessing connectors in a DSCM Tray

Figure 1-29
DSCM connectors

OM2662t



Preparing to connect optical components

This chapter contains diagrams of all of the supported site types, as well as guidelines for connecting components.

Because of the flexibility of the Optical Metro 5100/5200 platform, a multitude of site configurations exist. For this reason, it is recommended that you use the generic site diagrams on pages 2-4 and 2-73. These generic site diagrams represent all possible site configurations, and correspond to the representation of sites in the Optical Metro 5100/5200 Network Modeling Tool. Choose only those components that apply to your site configuration; all components are optional.

> ***Note:*** The figures in this chapter identifies circuit packs using a generic name. For example, in figures where the generic name MOTR is used, the actual circuit pack could be either a Muxponder 10 Gbit/s GbE/FC circuit pack or a Muxponder 10 Gbit/s GbE/FC VCAT circuit pack. For information on all circuit pack types, see *Hardware Description,* 323-1701-102. For circuit pack compatibility and configuration rules see, *Network Planning and Link Engineering,* 323-1701-110.

Although specific site examples are included as well, these examples are not representational of all of the possible site configurations, and may not accurately depict your site configuration. Additionally, it is important to understand that sites are not necessarily symmetrical in each direction. For example, you may have a site that requires amplification in the east-to-west direction, but does not require amplification in the west-to-east direction. If you use the specific site examples, you will likely need to use two examples to accurately depict a site in both directions.

Before you begin

Before you begin to make optical connections, use this chapter to identify the site types in your network and then review the guidelines for making the connections.

The site types are organized according to the following types:

- standard site configurations
- serial site configurations
- special cases
- legacy site configurations

Standard configurations

Standard configurations correspond to the "Standard" site layout in the Optical Metro 5100/5200 Network Modeling Tool. Standard sites meet at least one of the following conditions:

- C-band and L-band signals, if present, are multiplexed separately (that is, C-band and L-band OMXs are fibered in two parallel series).
- C-band or L-band components can be present at the site—not necessarily both.
- splitters and couplers are bookended. For more information about bookending C/L splitter/couplers, see "Guidelines for implementing straddled and bookended configurations for ECTs and C&L splitter/couplers" on page 2-155.

Serial configurations

Serial configurations correspond to the "Serial" site layout in the Optical Metro 5100/5200 Network Modeling Tool. Serial sites meet at least one of the following conditions:

- C-band and L-band signals are both present and are multiplexed in sequence (that is, C-band and L-band OMXs are fibered in one series).
- splitters and couplers are straddled around the equalization components and amplifiers. For more information about straddling C/L splitter/couplers, see "Guidelines for implementing straddled and bookended configurations for ECTs and C&L splitter/couplers" on page 2-155.

  Note: If the splitters and couplers are straddled around WDM shelves (not recommended), this is considered a special case. See the section "Special cases".

Special cases

There are a few site configurations that do not fall within the designations of Standard and Serial. In cases where the site configuration is supported in the Optical Metro 5100/5200 Network Modeling Tool (NMT), the corresponding NMT site layout is included in the section "Special cases" on page 2-102. Special cases include:

- OMX-less sites
- ITU CWDM sites
- sites with ECTs
- sites with Optical or Enhanced Trunk Switches
- Extended Metro DWDM Solution

Legacy configurations

The legacy site configurations use equalizer coupler trays (ECTs) for both the splitting/coupling operations and for equalization/attenuation. Because the configuration options for ECTs are limited, it is recommended that you use the updated C/L splitter/couplers and the equalization/attenuation component of your choice (PBE, APBE, OFA VGA, or discrete VOA). The examples in this section depict sites that are likely in existence from early versions of the Optical Metro 5100/5200 platform.

Standard configurations

Generic standard configuration

Figure 2-1 on page 2-4 shows a generic standard site configuration. All supported standard site configurations can be derived from this diagram. All of the possible components are included in this configuration; select only those components that are relevant to your site.

Figure 2-1
Generic standard site

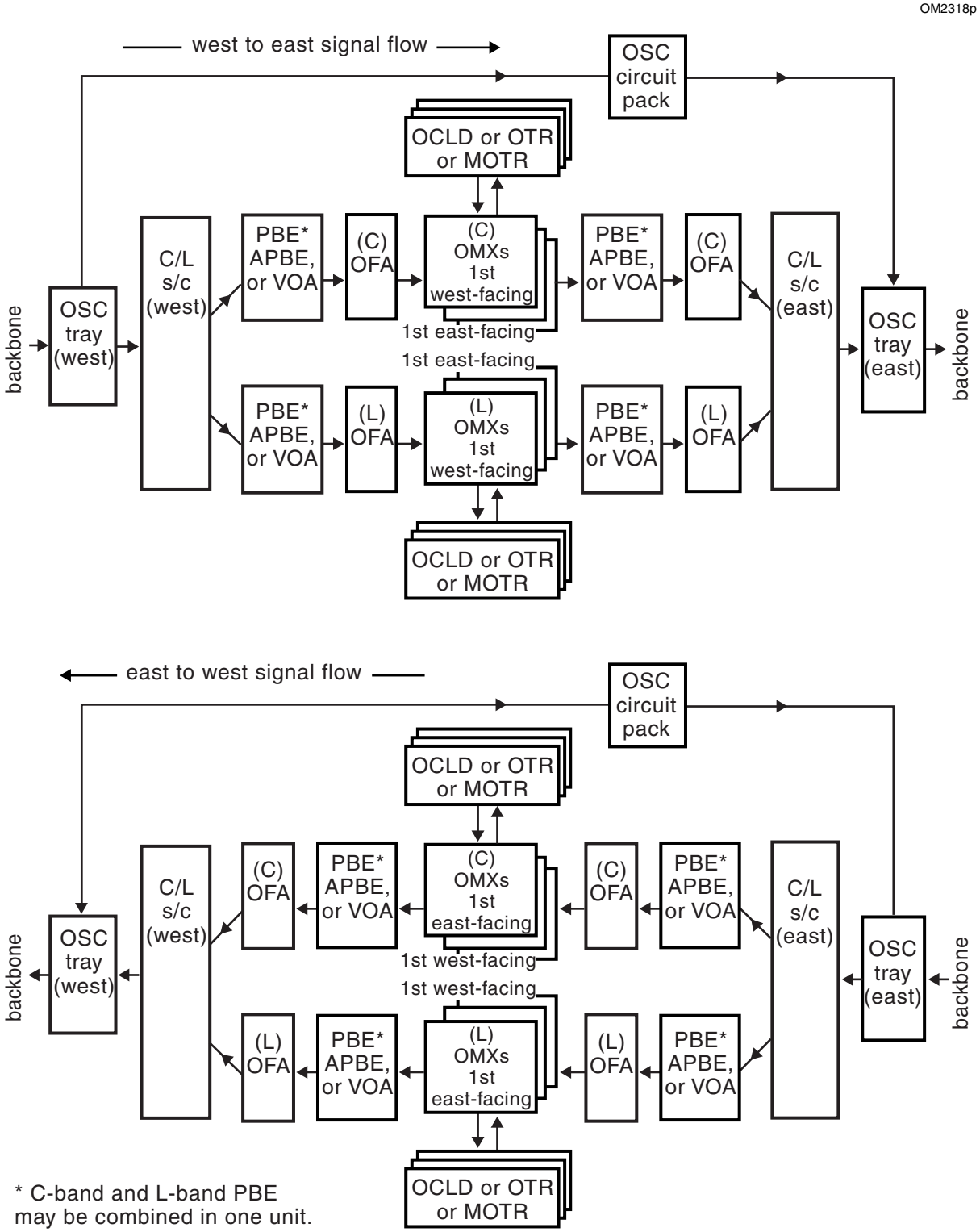


Table 2-1 lists all of the optical connections necessary to implement a standard site. Choose the procedures that apply to your site and see Part 2 of this book.

Table 2-1
Optical connections for a generic standard site

Task	Procedure
Connect OMX modules (see Note 1)	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect PBEs to other optical components	Procedure 3-8 Connecting PBEs
Connect APBEs to other optical components	Procedure 3-9 Connecting APBEs
Connect the discrete VOAs to other optical components (see Note 2)	Procedure 3-10 Connecting Discrete VOAs
Connect amplifiers to other optical components	Procedure 3-11 Connecting OFA circuit packs
Connect the OMX to other optical components	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
	Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
	Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
	Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Note 1: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.

Note 2: The OFA VGA has an integrated eVOA (electrically controlled variable optical attenuator). For this reason, a VOA is not required when an OFA VGA is used. An equalizer (PBE, APBE) may still be required.

Site examples

Table 2-2 lists the examples of some specific standard site configurations. Use one example for each direction (east-to-west and west-to-east).

Table 2-2
Standard site examples

Example	Page
Unamplified DWDM site with parallel WDM shelves using bookended C&L splitter/couplers	2-8
Unamplified DWDM terminal site with OMX 16CH DWDM	2-10
DWDM pre-amp site with either C-band or L-band WDM shelves using PBEs	2-12
DWDM pre-amp site with either C-band or L-band WDM shelves using APBEs	2-14
DWDM pre-amp site with either C-band or L-band WDM shelves using discrete VOAs	2-16
DWDM pre-amp site with parallel WDM shelves using PBEs with bookended C&L splitter/couplers	2-18
DWDM pre-amp site with parallel WDM shelves using APBEs with bookended C&L splitter/couplers	2-20
DWDM pre-amp site with parallel WDM shelves using distributed equalization	2-22
DWDM post-amp site with either C-band or L-band WDM shelves using PBEs	2-24
DWDM post-amp site with either C-band or L-band WDM shelves using APBEs	2-26
DWDM post-amp site with either C-band or L-band WDM shelves using discrete VOAs	2-28
DWDM post-amp site with parallel WDM shelves using PBEs with bookended C&L splitter/couplers	2-30
DWDM post-amp site with parallel WDM shelves using APBEs with bookended C&L splitter/couplers	2-32
DWDM post-amp site with parallel WDM shelves using discrete VOAs with bookended C&L splitter/couplers	2-34
DWDM post-amp site with parallel WDM shelves using distributed equalization	2-36
DWDM pre-amp and post-amp site with either C-band or L-band WDM shelves using PBEs	2-38
DWDM pre-amp and post-amp site with either C-band or L-band WDM shelves using APBEs	2-40
DWDM pre-amp and post-amp site with parallel WDM shelves using PBEs	2-42
DWDM pre-amp and post-amp site with parallel WDM shelves using APBEs	2-44

Table 2-2 (continued)
Standard site examples

Figure 2-2
Unamplified DWDM site with parallel WDM shelves using bookended C&L splitter/couplers

OM1335p

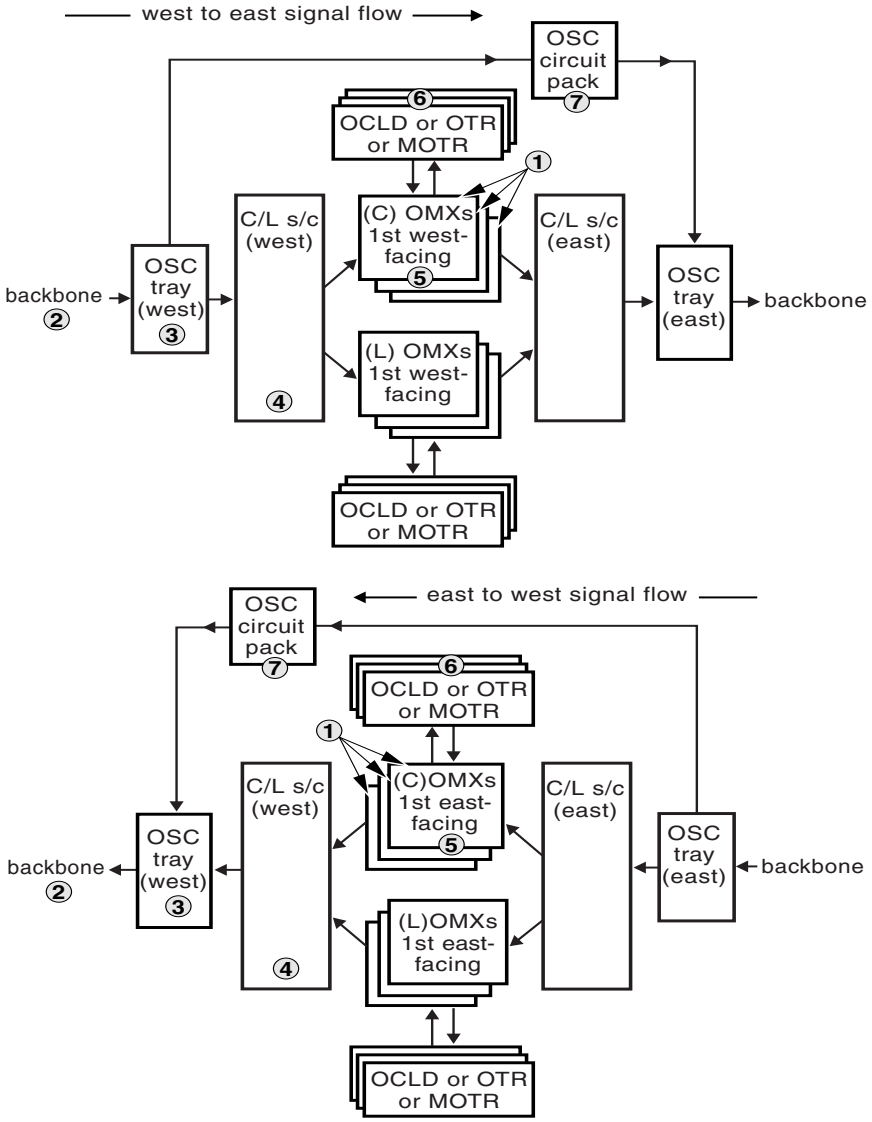


Figure 2-2 on page 2-8 does not apply if an OMX 16CH DWDM is required. For a generic standard site configuration with OMX 16CH DWDM, refer to Figure 2-3, Unamplified DWDM terminal site with OMX 16CH DWDM on page 2-10 as an example.

Table 2-3
Optical connections for an unamplified DWDM site with parallel WDM shelves using bookended C&L splitter/couplers

Task	Label on figure	Procedure
Connect OMX modules (See Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	4	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	6	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	7	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-3
Unamplified DWDM terminal site with OMX 16CH DWDM

OM2423p

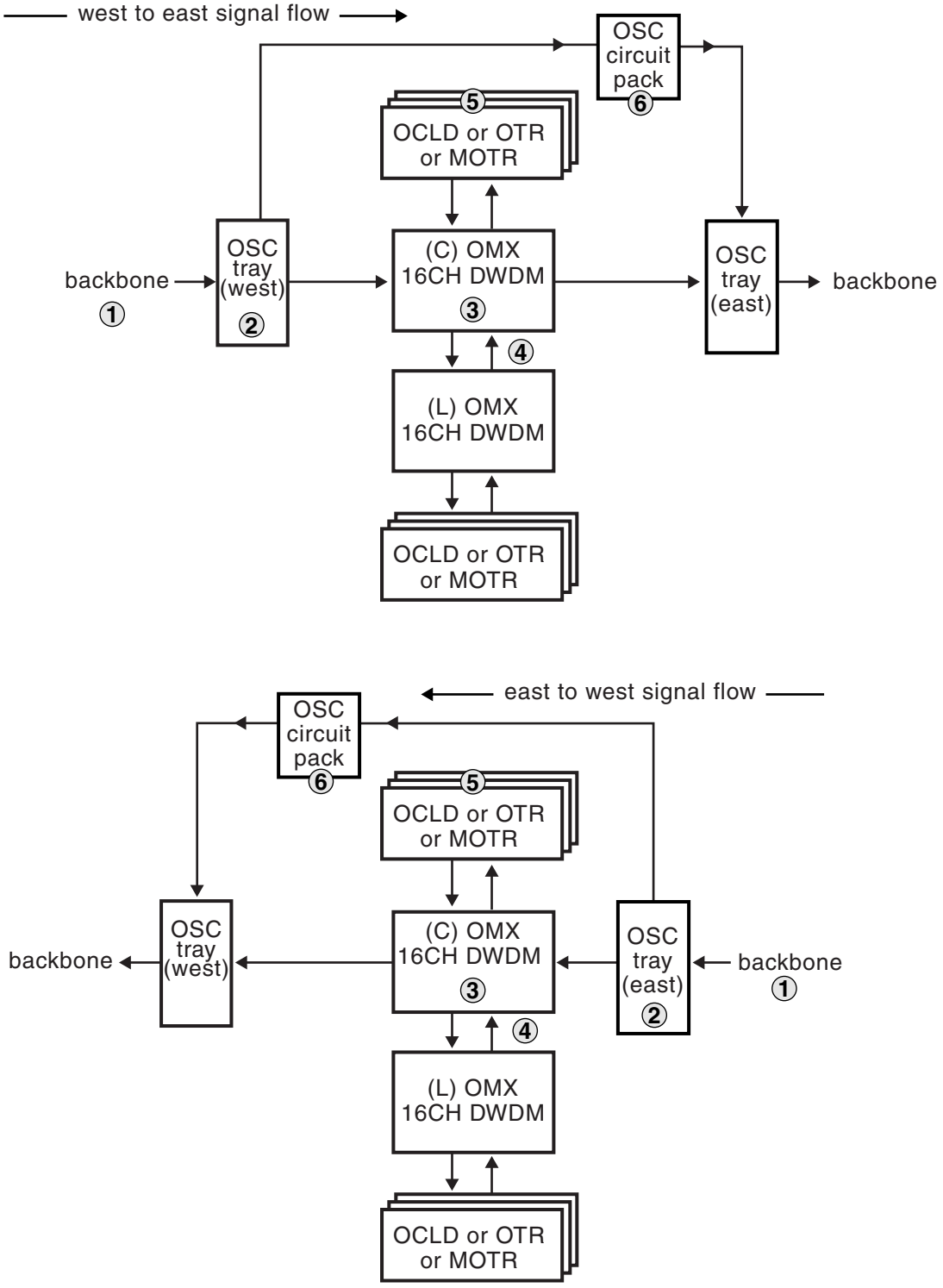


Table 2-4
Optical connections for an unamplified DWDM terminal site with OMX 16CH DWDM

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the OMX to other optical components	3	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect OMX 16CH DWDM (L-Band) to OMX 16CH DWDM (C-Band) if required.	4	Procedure 3-4 Connecting OMX 16CH DWDM (C Band) to OMX 16CH DWDM (L Band) on page 3-35
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC, or OTR circuit packs	5	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	6	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Figure 2-4
DWDM pre-amp site with either C-band or L-band WDM shelves using PBEs

OM1807

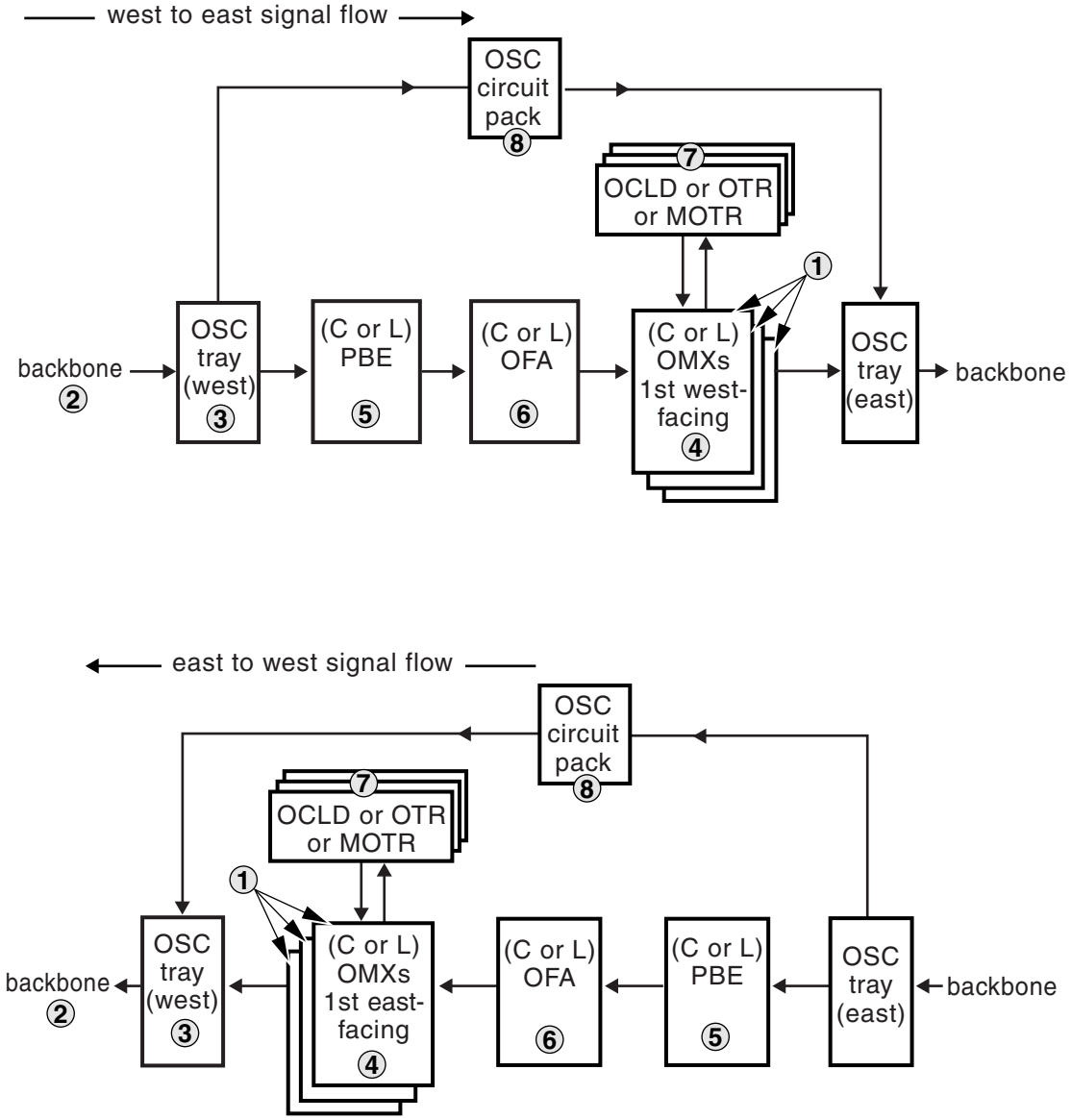


Table 2-5
Optical connections for a DWDM pre-amp site with either C-band or L-band shelves using PBEs

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the OMX to other optical components	4	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the PBE	5	Procedure 3-8 Connecting PBEs on page 3-60
Connect the amplifiers to other optical components	6	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	7	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	8	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-5
DWDM pre-amp site with either C-band or L-band WDM shelves using APBEs

OM1808

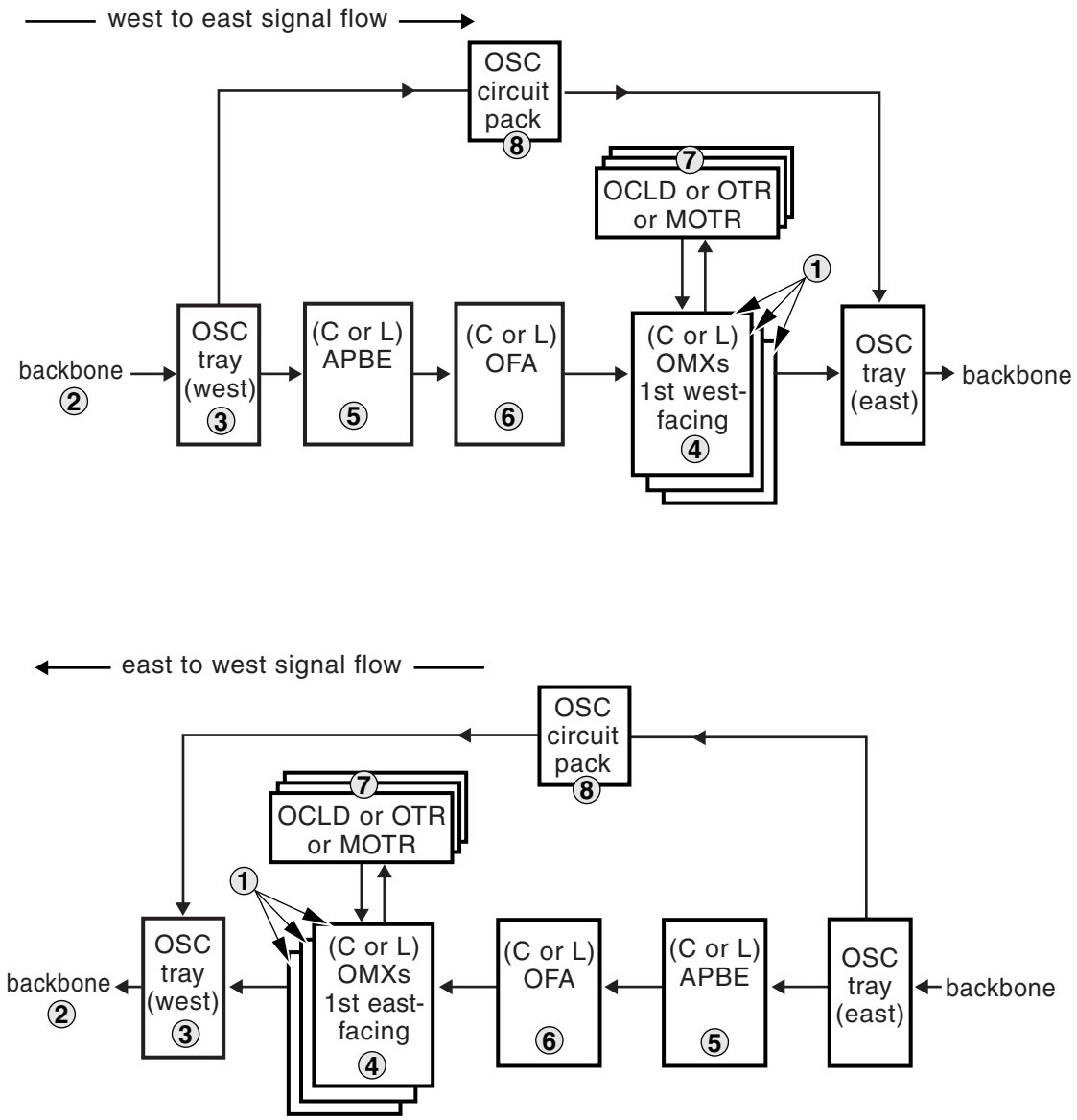


Table 2-6
Optical connections for a DWDM pre-amp site with either C-band or L-band shelves using APBEs

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the OMX to other optical components	4	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the APBE	5	Procedure 3-9 Connecting APBEs on page 3-64
Connect the amplifiers to other optical components	6	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC, or OTR circuit packs	7	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	8	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-6
DWDM pre-amp site with either C-band or L-band WDM shelves using discrete VOAs

OM2298p

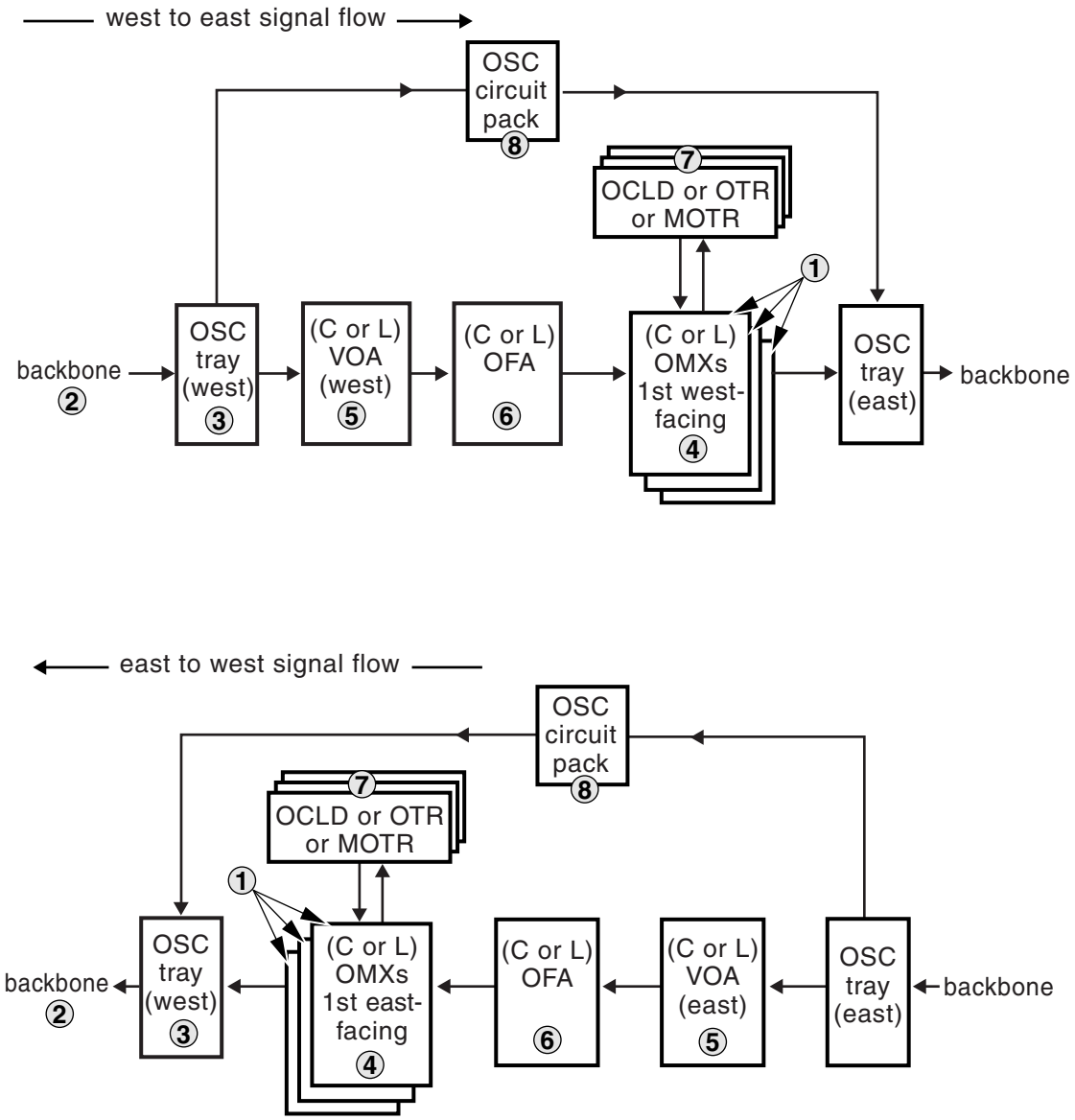


Table 2-7
Optical connections for a DWDM pre-amp site with either C-band or L-band WDM shelves using discrete VOAs

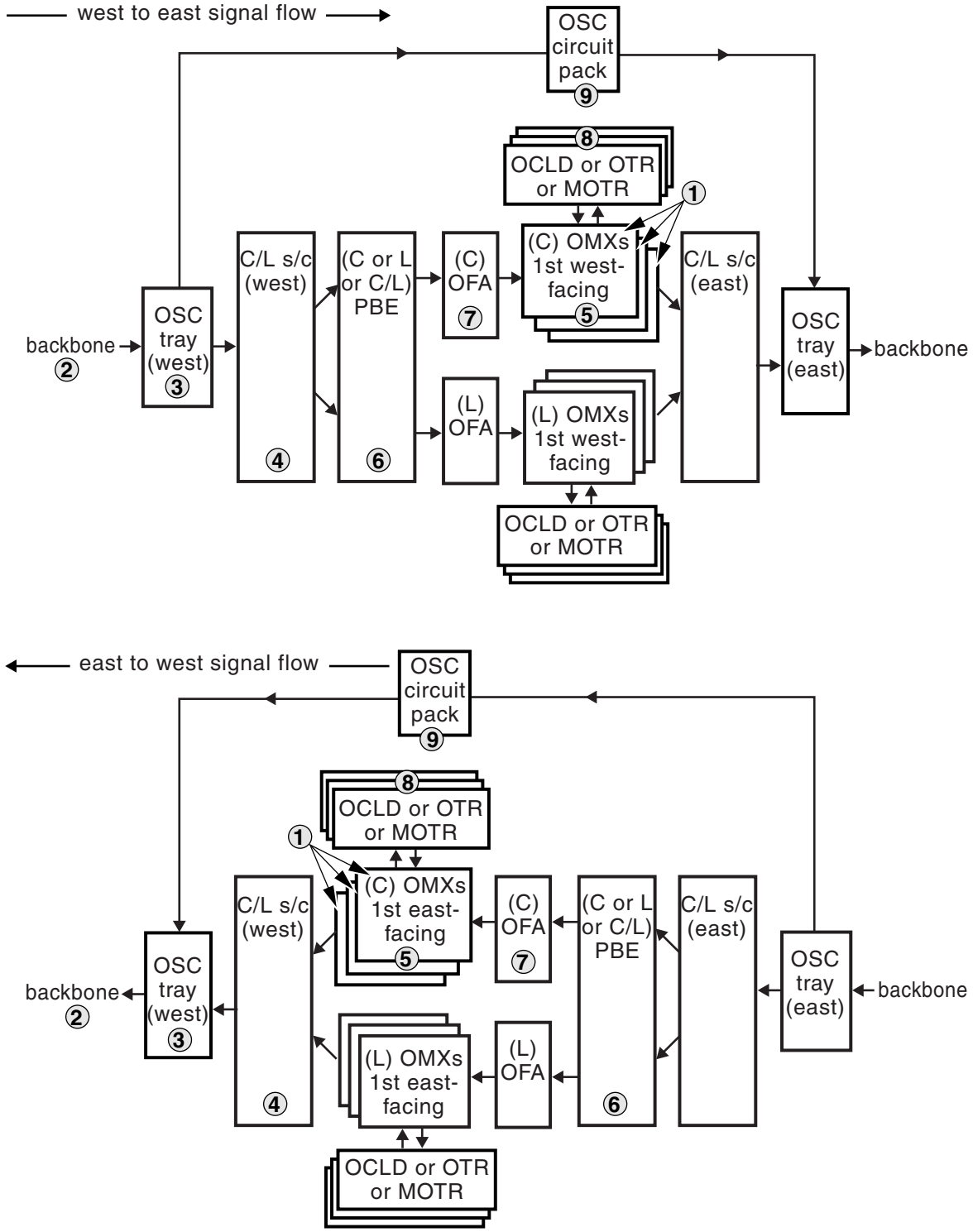
Task	Label on figure	Procedure
Connect OMX modules (see Note1)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the OMX to other optical components	4	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the discrete VOA to other optical components (see Note 2)	5	Procedure 3-10 Connecting Discrete VOAs
Connect the amplifiers to other optical components	6	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC, or OTR circuit packs	7	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	8	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Note 1: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.

Note 2: The OFA VGA has an integrated eVOA (electrically controlled variable optical attenuator). For this reason, a VOA is not required when an OFA VGA is used. An equalizer (PBE, APBE) may still be required.

Figure 2-7
DWDM pre-amp site with parallel WDM shelves using PBEs with bookended C&L splitter/couplers

OM1371p



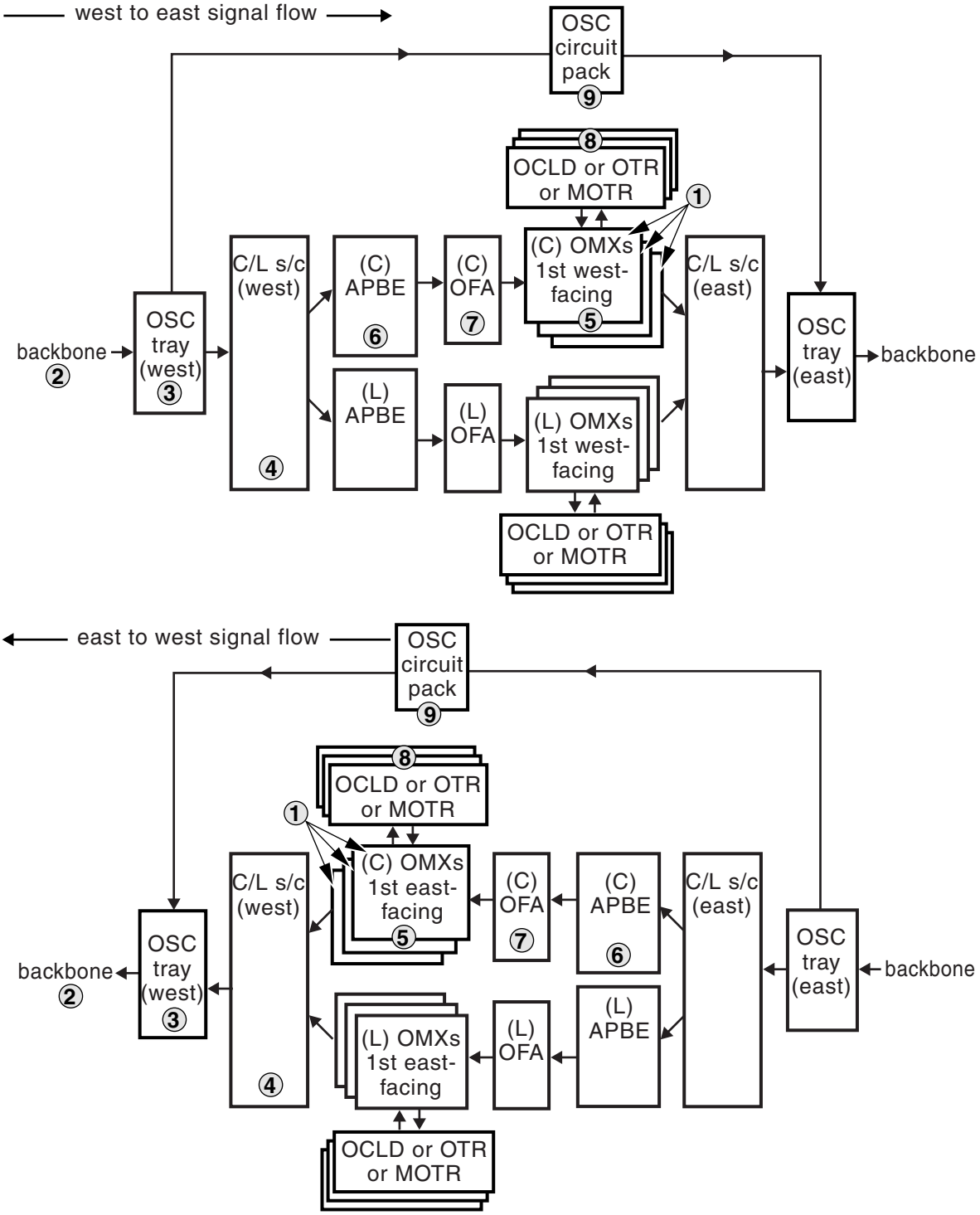
Note: If the inbound signal in one direction comes directly from an upstream amplifier (i.e. the pre-amp in that direction is the second or subsequent amplifier in the chain with no OMXs in the chain), then there is no need for equalization of the signal into the pre-amplifier. Therefore, the C&L splitter/coupler and PBE associated with the pre-amplifier in that direction can be replaced with the NT0H31AD ECT.

Table 2-8
Optical connections for a DWDM pre-amp site with parallel WDM shelves using PBEs with bookended C&L splitter/couplers

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	4	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the PBE to other optical components	6	Procedure 3-8 Connecting PBEs on page 3-60
Connect the amplifiers to other optical components	7	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	8	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	9	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-8
DWDM pre-amp site with parallel WDM shelves using APBEs with bookended C&L splitter/couplers

OM1373p



Note: If the inbound signal in one direction comes directly from an upstream amplifier (i.e. the pre-amp in that direction is the second or subsequent amplifier in the chain with no OMXs in the chain), then there is no need for equalization of the signal into the pre-amplifier. Therefore, the C&L splitter/coupler and APBE associated with the pre-amplifier in that direction can be replaced with the NT0H31AD ECT.

Table 2-9
Optical connections for a DWDM pre-amp site with parallel WDM shelves using APBEs with bookended C&L splitter/couplers

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	4	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the APBE to other optical components	6	Procedure 3-9 Connecting APBEs on page 3-64
Connect the amplifiers to other optical components	7	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	8	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	9	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-9
DWDM pre-amp site with parallel WDM shelves using distributed equalization

OM1810

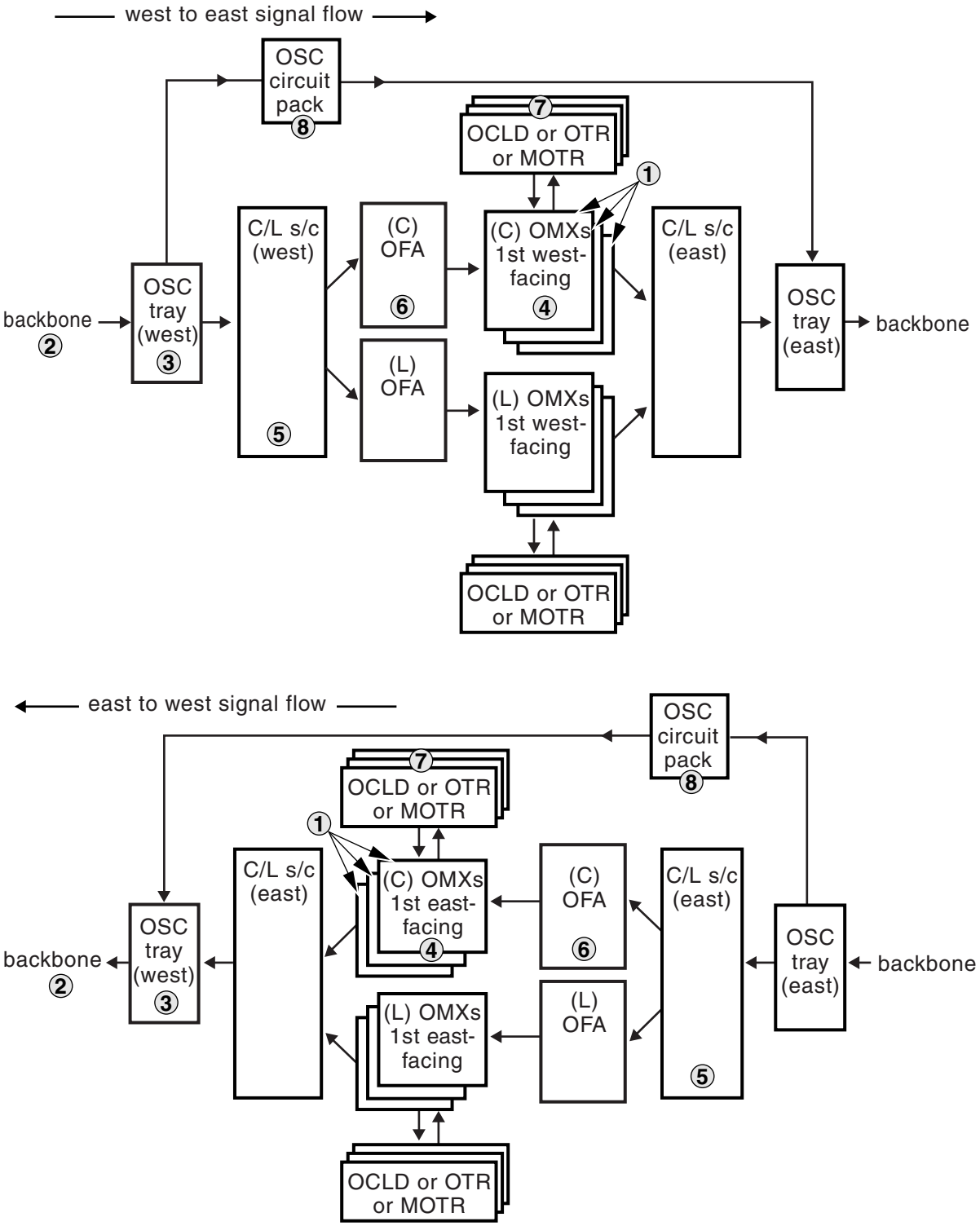


Table 2-10
Optical connections for a DWDM pre-amp site with parallel WDM shelves using distributed equalization

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the OMX to other optical components	4	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect C&L splitter/couplers to other optical components	5	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the amplifiers to other optical components	6	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	7	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	8	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-10
DWDM post-amp site with either C-band or L-band WDM shelves using PBEs

OM1811p

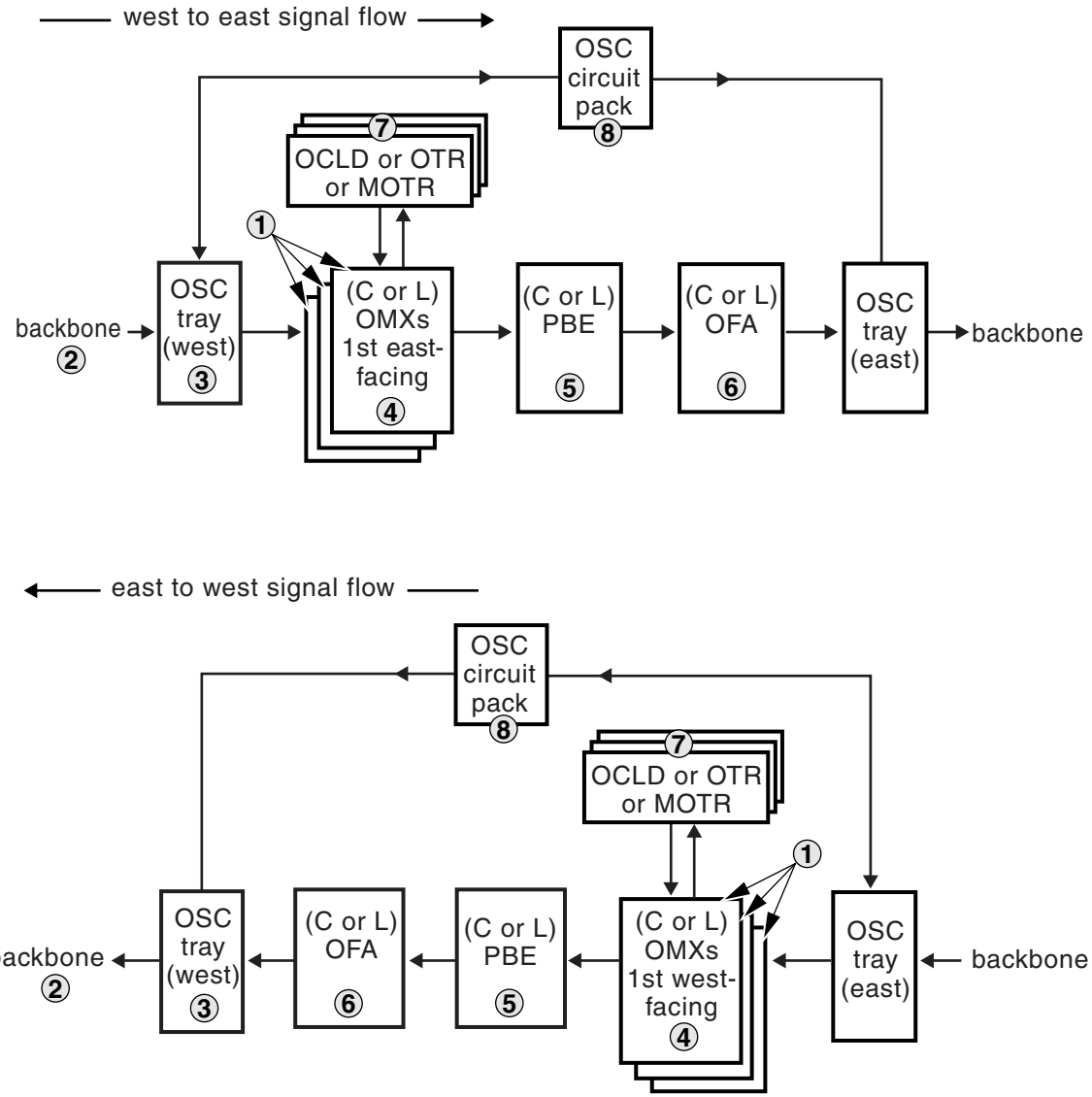


Table 2-11
Optical connections for a DWDM post-amp site with either C-band or L-band shelves using PBEs

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the OMX to other optical components	4	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the PBE to other optical components	5	Procedure 3-8 Connecting PBEs on page 3-60
Connect the amplifiers to other optical components	6	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	7	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	8	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-11
DWDM post-amp site with either C-band or L-band WDM shelves using APBEs

OM1813p

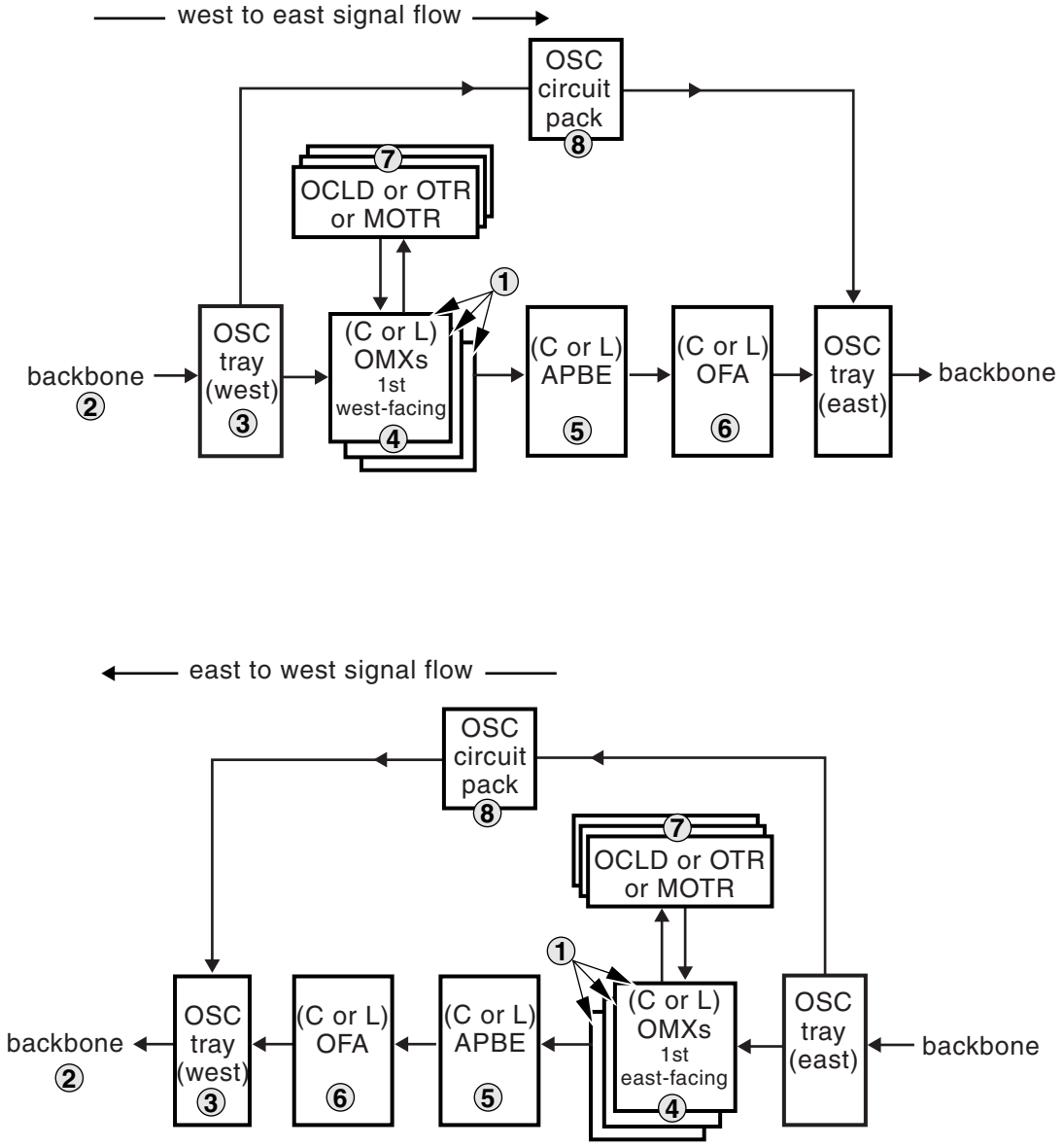


Table 2-12
Optical connections for a DWDM post-amp site with either C-band or L-band shelves using APBEs

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the OMX to other optical components	4	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the APBE to other optical components	5	Procedure 3-9 Connecting APBEs on page 3-64
Connect the amplifiers to other optical components	6	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	7	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	8	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-12
DWDM post-amp site with either C-band or L-band WDM shelves using discrete VOAs

OM2301p

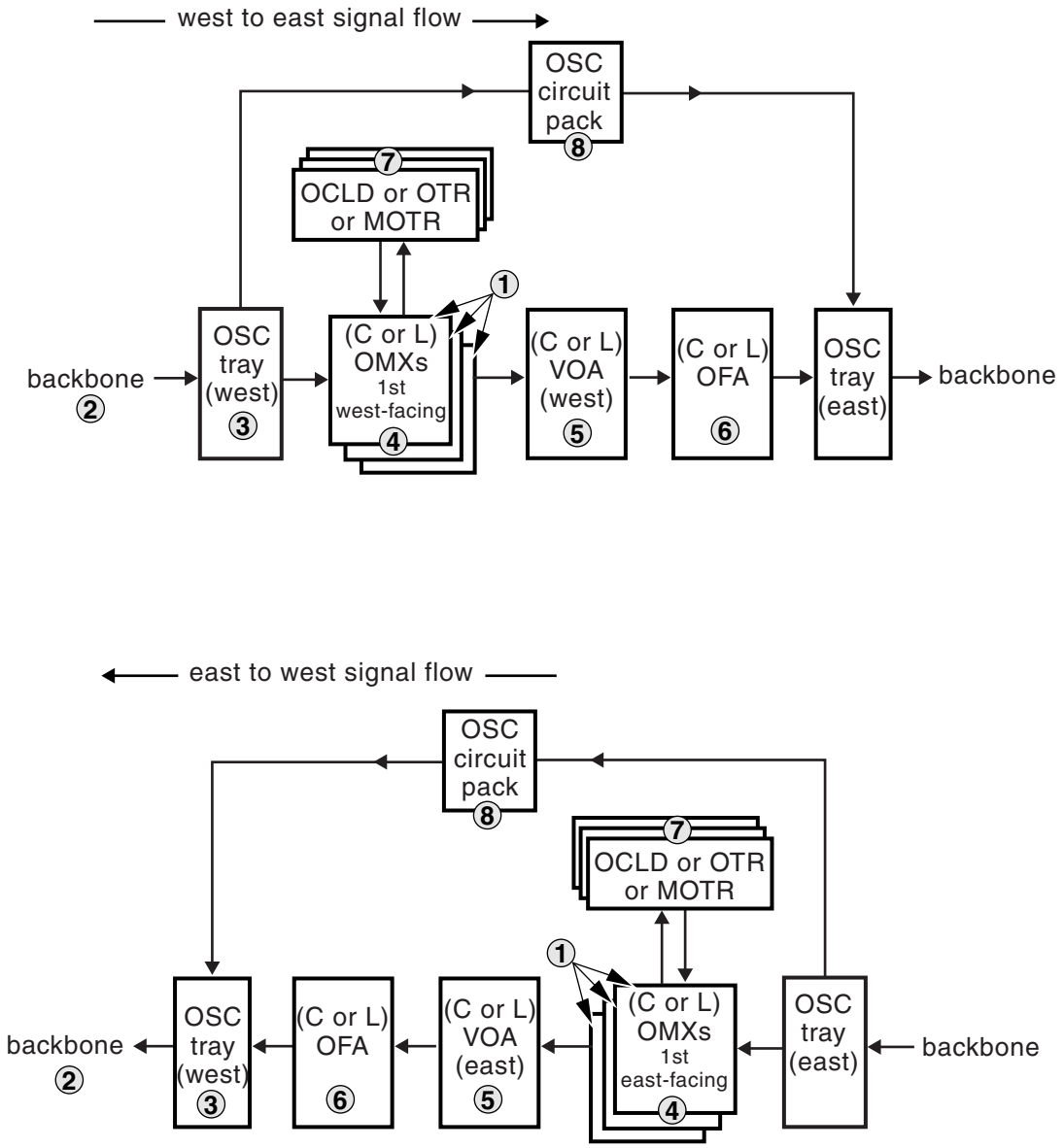


Table 2-13
Optical connections for a DWDM post-amp site with either C-band or L-band WDM shelves using discrete VOAs

Task	Label on figure	Procedure
Connect OMX modules (see Note1)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the OMX to other optical components	4	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the discrete VOA to other optical components (see Note 2)	5	Procedure 3-10 Connecting Discrete VOAs
Connect the amplifiers to other optical components	6	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	7	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	8	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Note 1: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.

Note 2: The OFA VGA has an integrated eVOA (electrically controlled variable optical attenuator). For this reason, a VOA is not required when an OFA VGA is used. An equalizer (PBE, APBE) may still be required.

Figure 2-13
DWDM post-amp site with parallel WDM shelves using PBEs with bookended C&L splitter/couplers

OM1343p

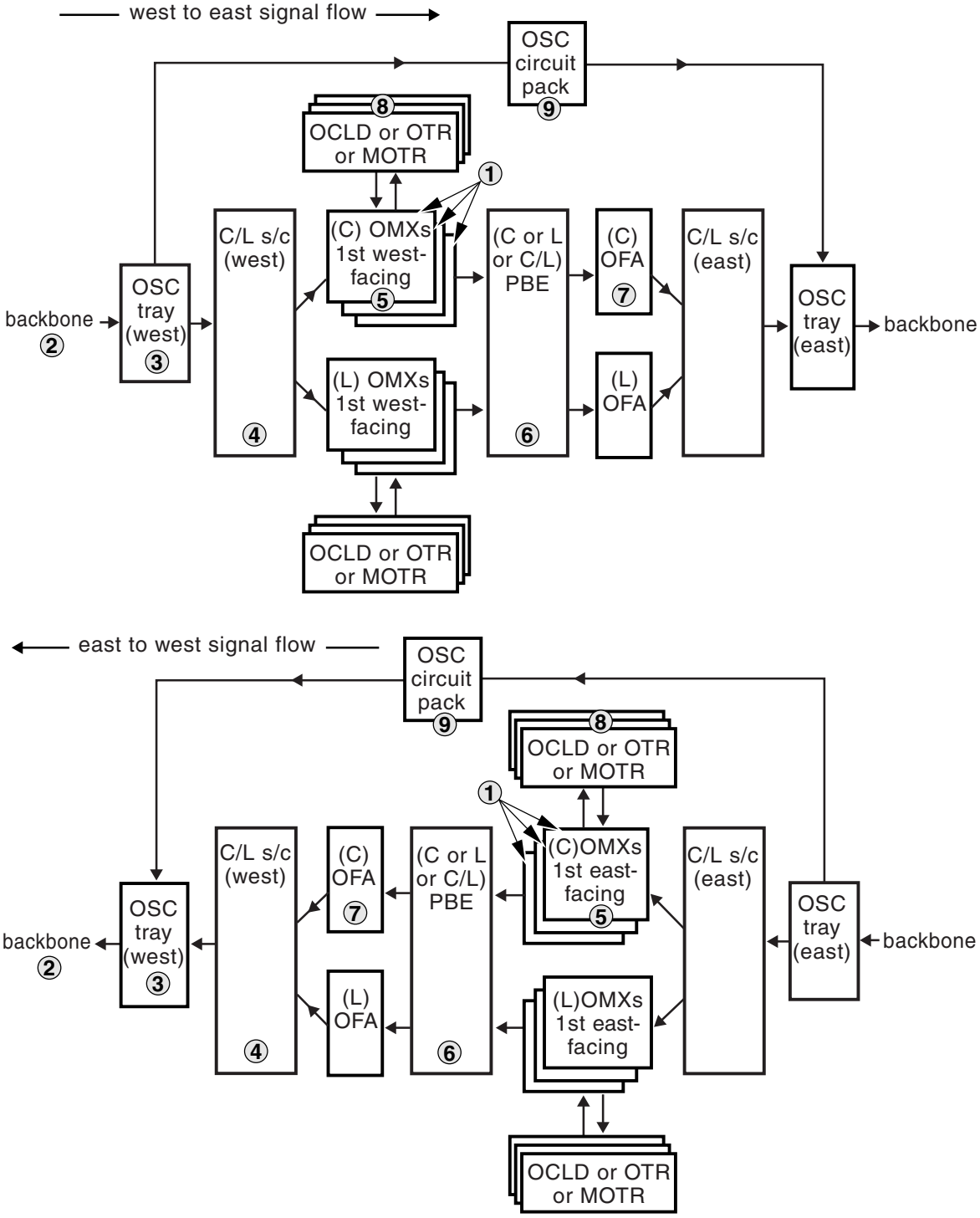


Table 2-14
Optical connections for a DWDM post-amp site with parallel WDM shelves using PBEs with bookended C&L splitter/couplers

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	4	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the PBE to other optical components	6	Procedure 3-8 Connecting PBEs on page 3-60
Connect the amplifiers to other optical components	7	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	8	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	9	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-14
DWDM post-amp site with parallel WDM shelves using APBEs with bookended C&L splitter/couplers

OM1345p

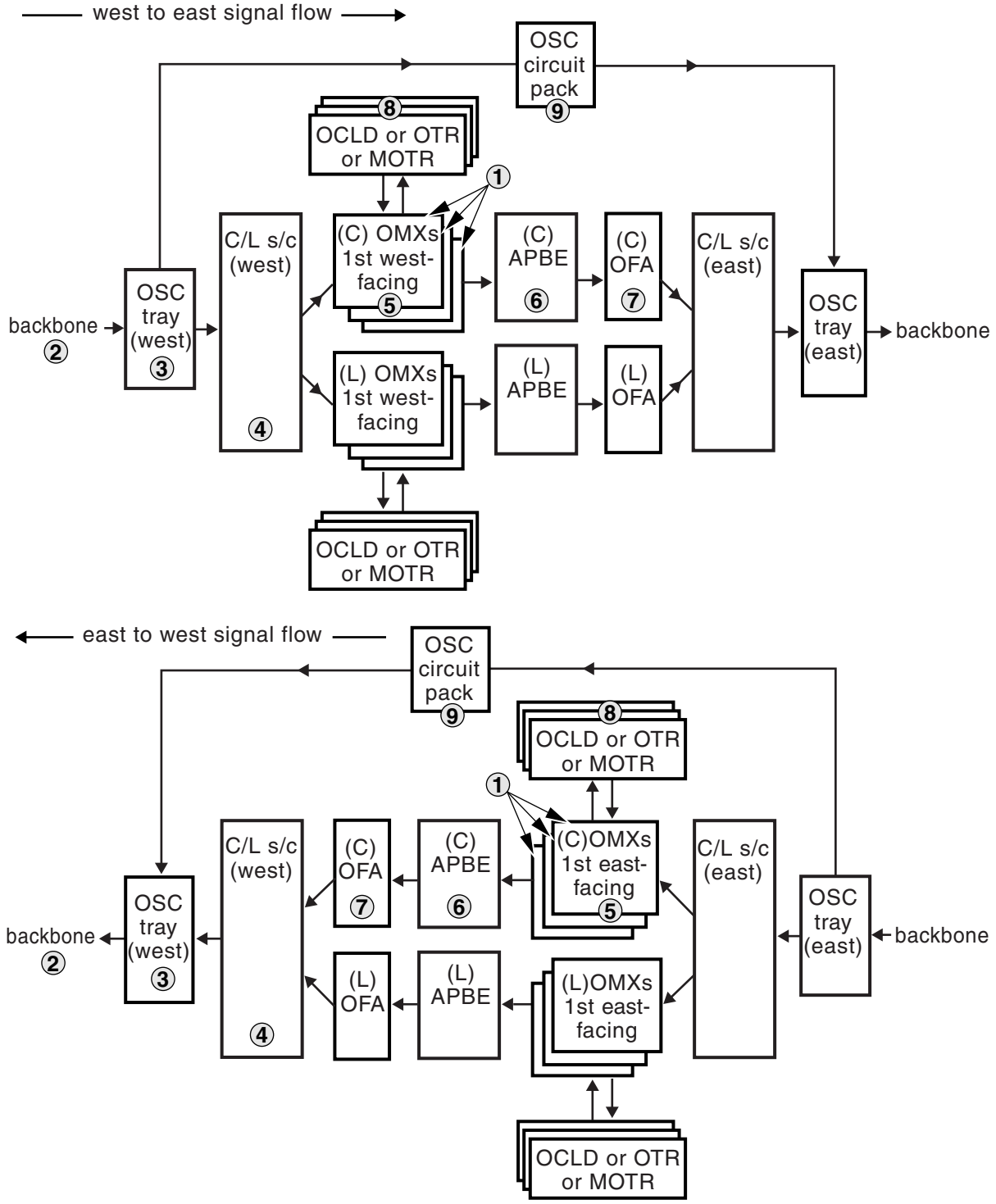


Table 2-15
Optical connections for a DWDM post-amp site with parallel WDM shelves using APBEs with bookended C&L splitter/couplers

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	4	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the APBE to other optical components	6	Procedure 3-9 Connecting APBEs on page 3-64
Connect the amplifiers to other optical components	7	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	8	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	9	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-15
DWDM post-amp site with parallel WDM shelves using discrete VOAs with bookended C&L splitter/couplers

OM2305p

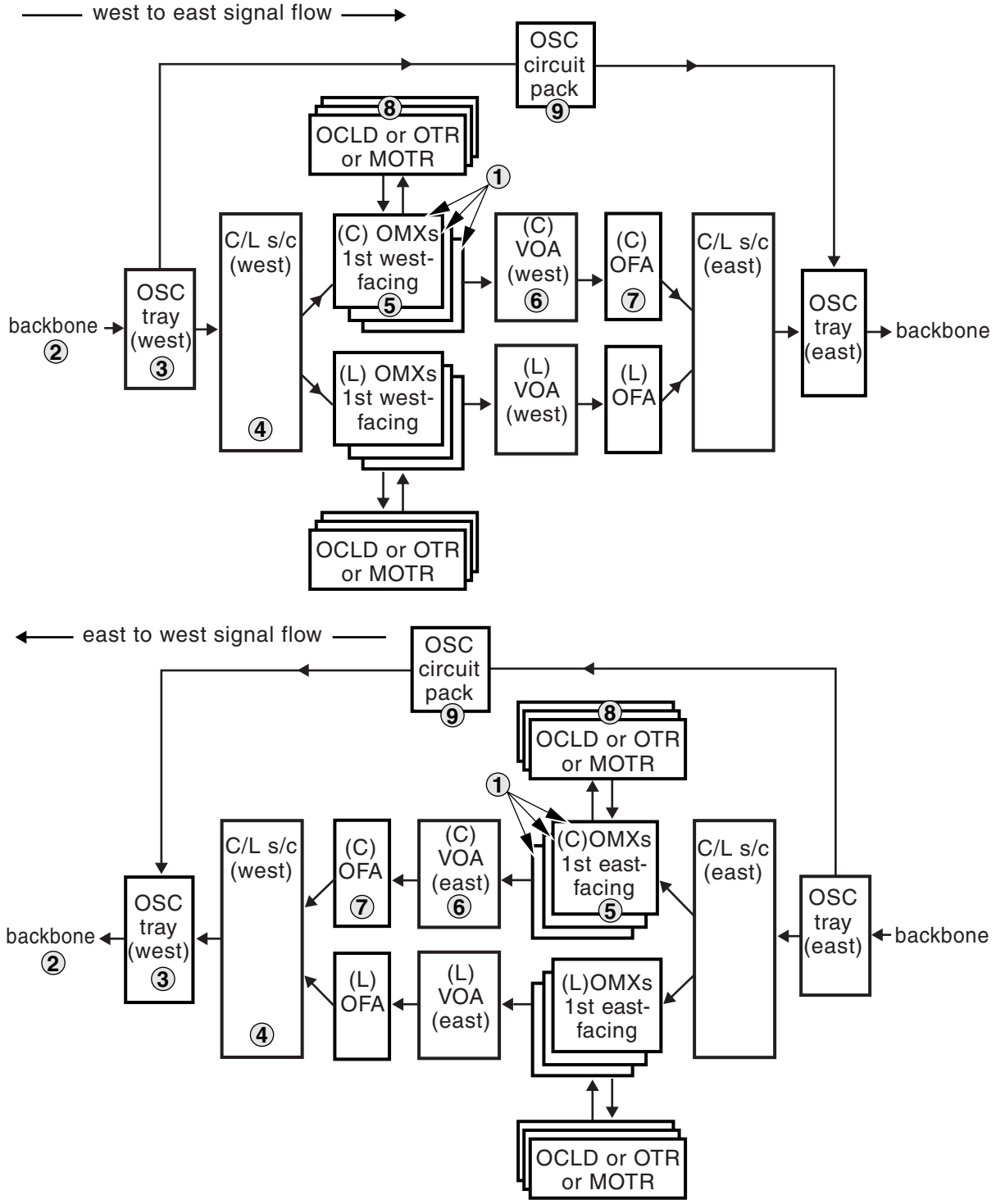


Table 2-16
Optical connections for a DWDM post-amp site with parallel WDM shelves using discrete VOAs with bookended C&L splitter/couplers

Task	Label on figure	Procedure
Connect OMX modules (see Note1)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	4	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the discrete VOA to other optical components (see Note 2)	6	Procedure 3-10 Connecting Discrete VOAs
Connect the amplifiers to other optical components	7	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	8	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	9	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Note 1: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.

Note 2: The OFA VGA has an integrated eVOA (electrically controlled variable optical attenuator). For this reason, a VOA is not required when an OFA VGA is used. An equalizer (PBE, APBE) may still be required.

Figure 2-16
DWDM post-amp site with parallel WDM shelves using distributed equalization

OM1815p

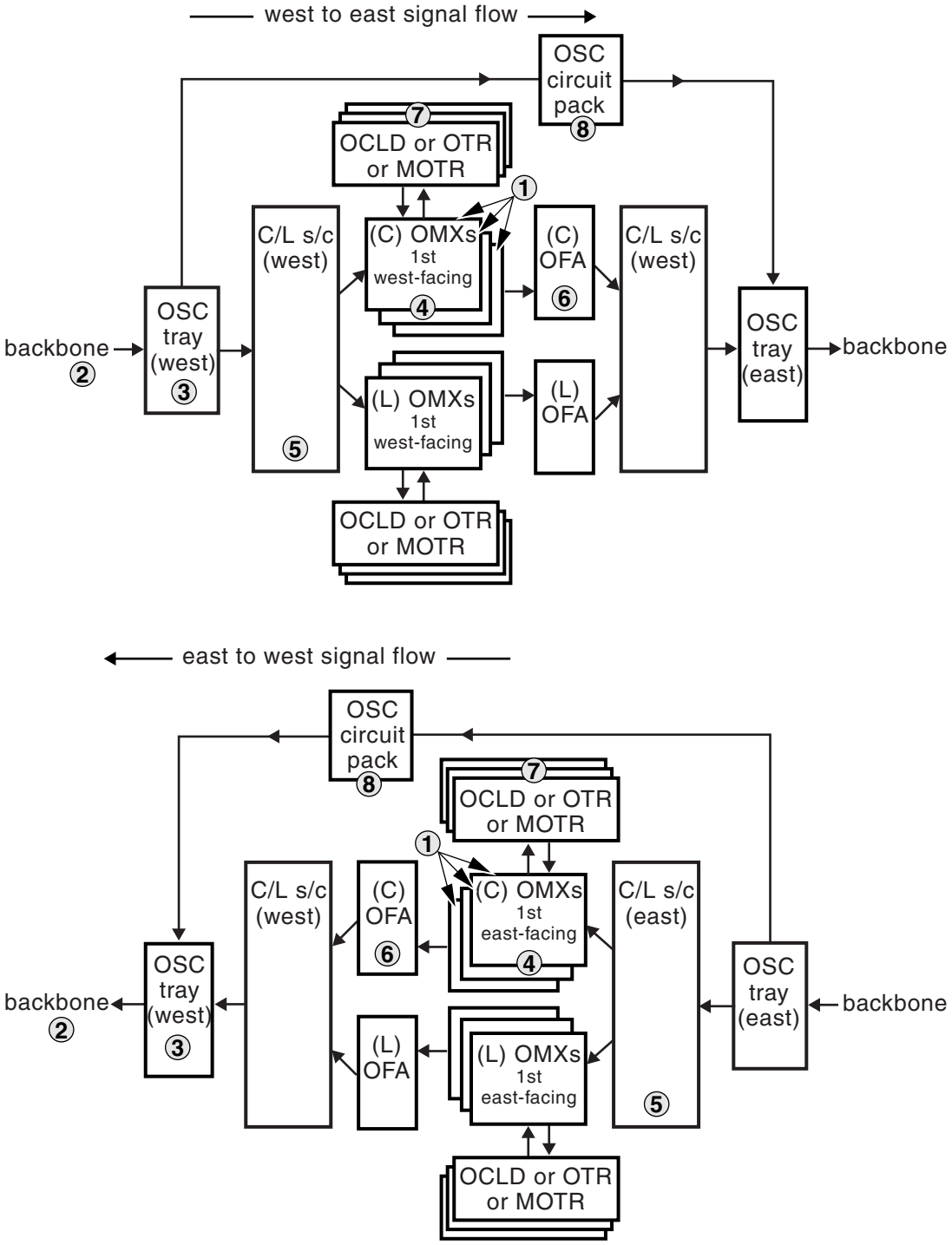


Table 2-17
Optical connections for a DWDM post-amp site with parallel WDM shelves using distributed equalization

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the OMX to other optical components	4	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect C&L splitter/couplers to other optical components	5	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the amplifiers to other optical components	6	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	7	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	8	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-17
DWDM pre-amp and post-amp site with either C-band or L-band WDM shelves using PBEs

OM1834p

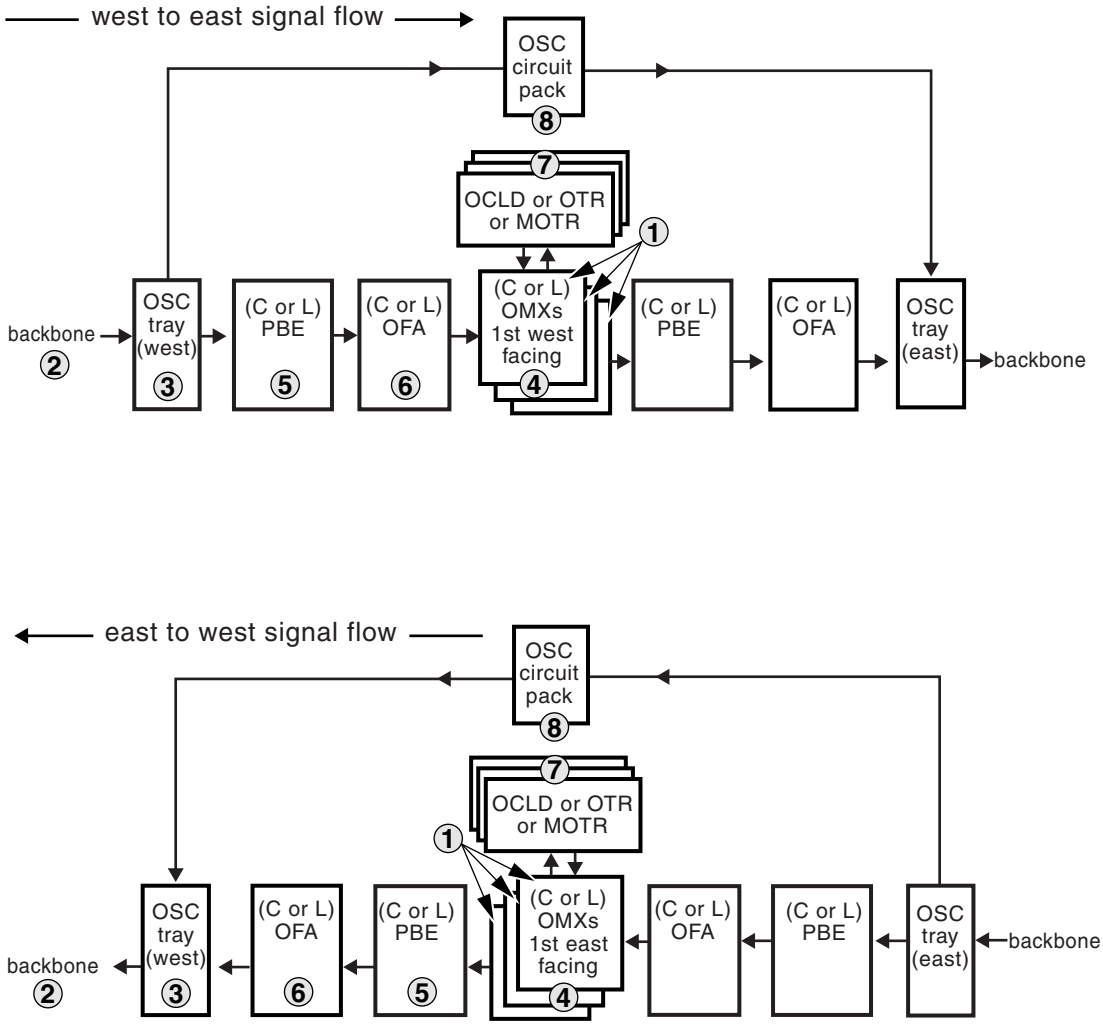


Table 2-18
Optical connections for a DWDM pre-amp and post-amp site with either C-band or L-band WDM shelves using PBEs

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the OMX to other optical components	4	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the PBE to other optical components	5	Procedure 3-8 Connecting PBEs on page 3-60
Connect the amplifiers to other optical components	6	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	7	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	8	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-18
DWDM pre-amp and post-amp site with either C-band or L-band WDM shelves using APBEs

OM1835p

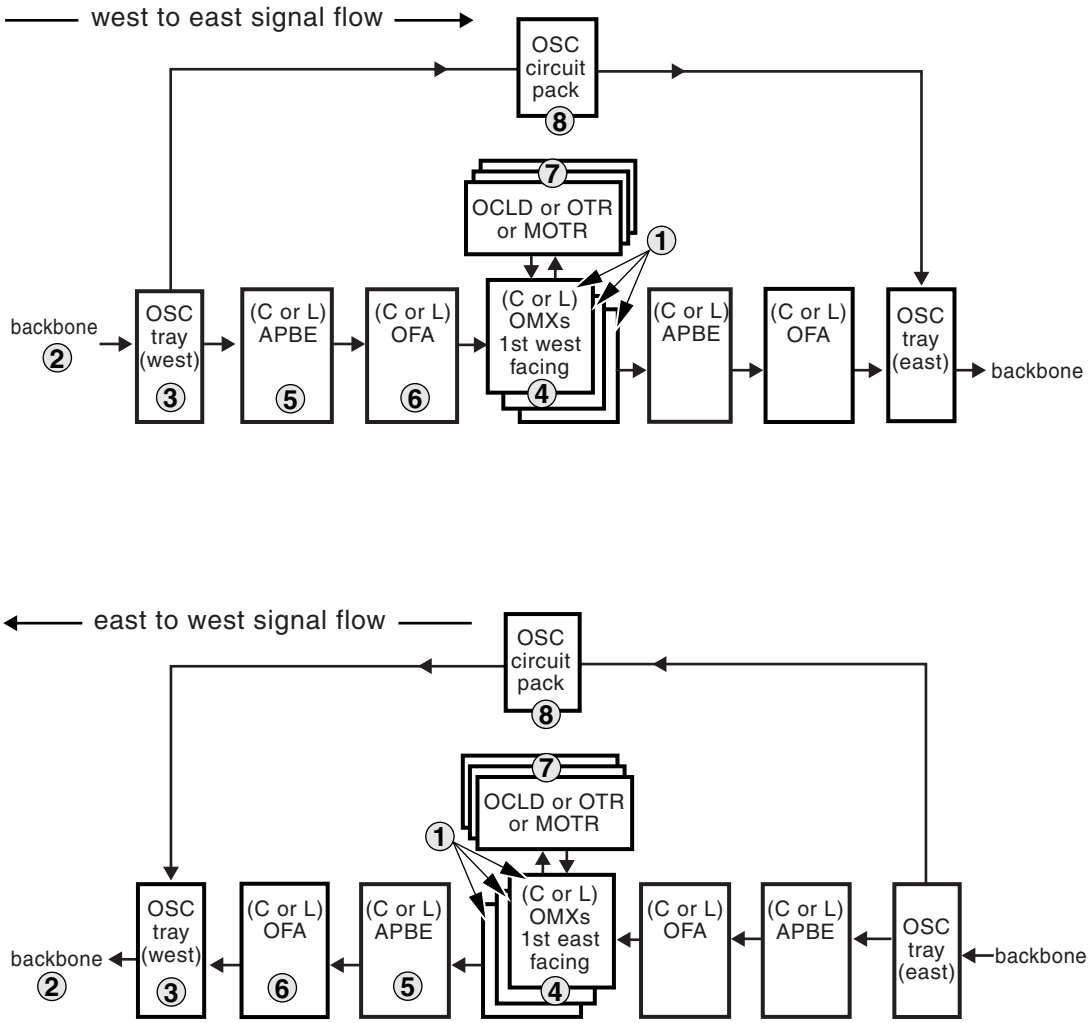
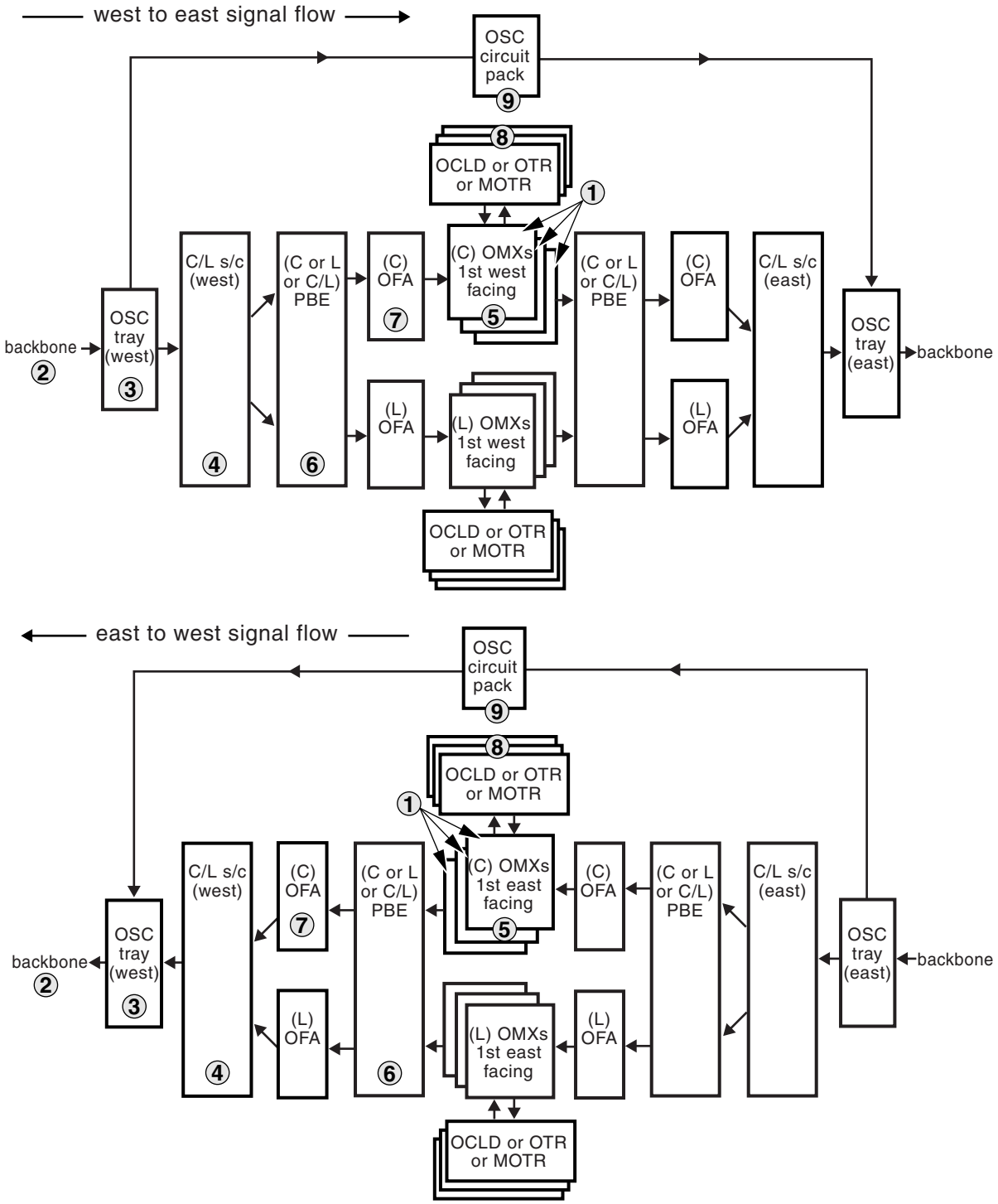


Table 2-19
Optical connections for a DWDM pre-amp and post-amp site with either C-band or L-band WDM shelves using APBEs

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the OMX to other optical components	4	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the APBE to other optical components	5	Procedure 3-9 Connecting APBEs on page 3-64
Connect the amplifiers to other optical components	6	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	7	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	8	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-19
DWDM pre-amp and post-amp site with parallel WDM shelves using PBEs

OM1318p



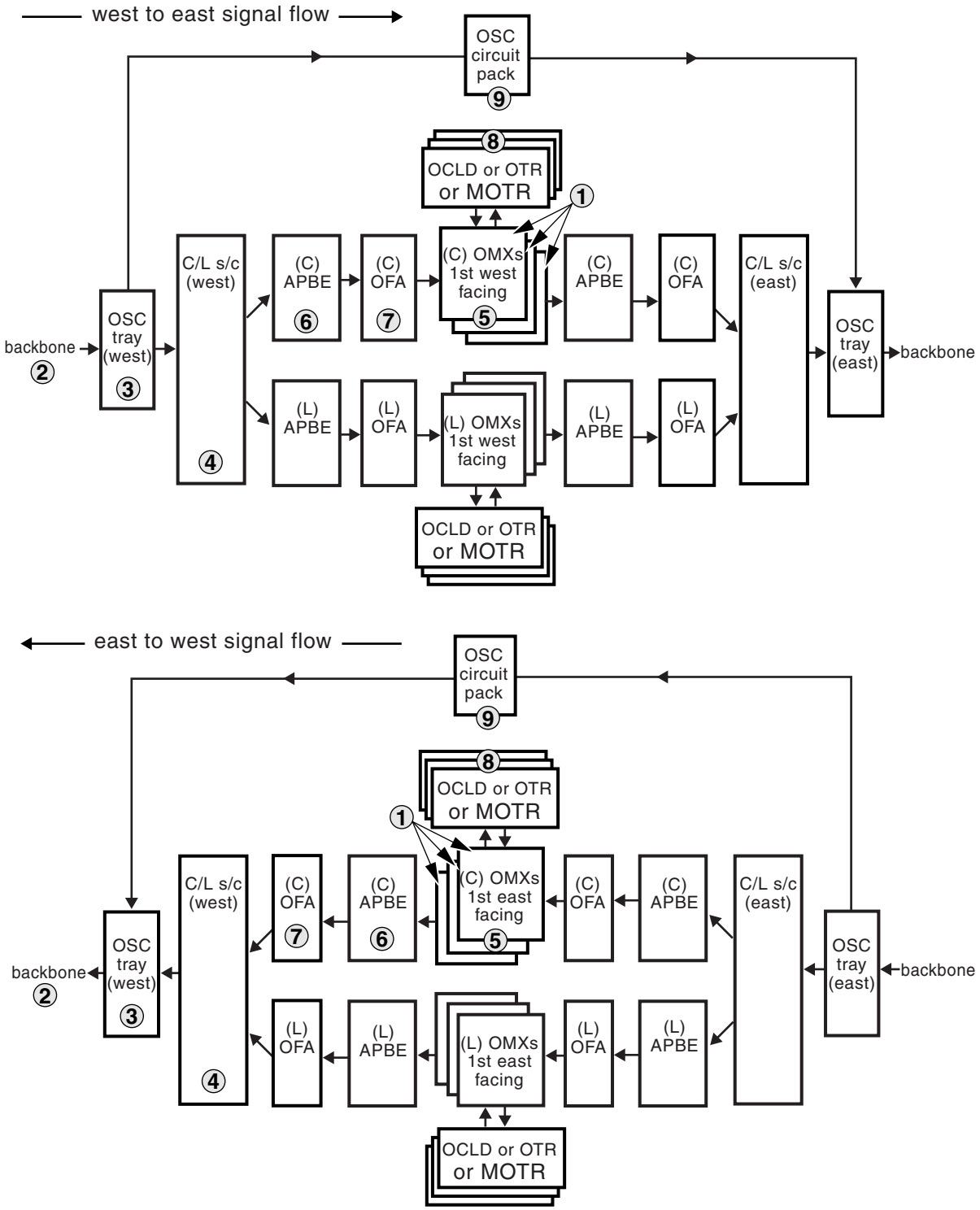
Note: If the inbound signal in one direction comes directly from an upstream amplifier (i.e. the pre-amp in that direction is the second or subsequent amplifier in the chain with no OMXs in the chain), then there is no need for equalization of the signal into the pre-amplifier. Therefore, the C&L splitter/coupler and PBE associated with the pre-amplifier in that direction can be replaced with the NT0H31AD ECT.

Table 2-20
Optical connections for a DWDM pre-amp and post-amp site with parallel WDM shelves using PBEs

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	4	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the PBE to other optical components	6	Procedure 3-8 Connecting PBEs on page 3-60
Connect the amplifiers to other optical components	7	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	8	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	9	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-20
DWDM pre-amp and post-amp site with parallel WDM shelves using APBEs

OM1319p



Note: If the inbound signal in one direction comes directly from an upstream amplifier (that is, if the pre-amp in that direction is the second or subsequent amplifier in the chain with no OMXs in the chain), then there is no need for equalization of the signal into the pre-amplifier. Therefore, the C&L splitter/coupler and APBE associated with the pre-amplifier in that direction can be replaced with the NT0H31AD ECT.

Table 2-21
Optical connections for a DWDM pre-amp and post-amp site with parallel WDM shelves using APBEs

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	4	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the APBE to other optical components	6	Procedure 3-9 Connecting APBEs on page 3-64
Connect the amplifiers to other optical components	7	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	8	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	9	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-21
DWDM pre-amp and post-amp site with parallel WDM shelves using discrete VOAs

OM2307p

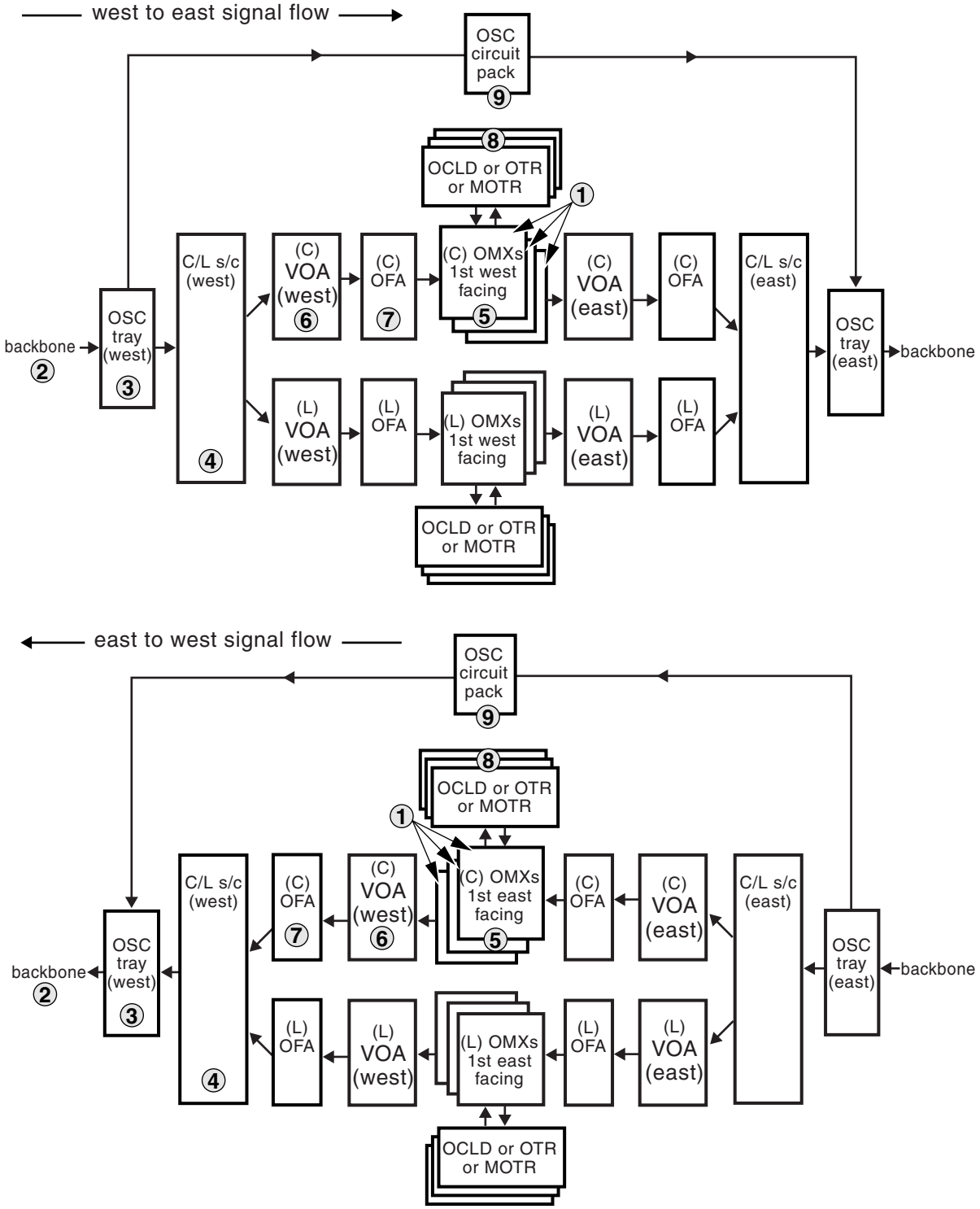


Table 2-22
Optical connections for a DWDM pre-amp and post-amp site with parallel WDM shelves using discrete VOAs

Task	Label on figure	Procedure
Connect OMX modules (see Note1)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	4	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the discrete VOA to other optical components (see Note 2)	6	Procedure 3-10 Connecting Discrete VOAs
Connect the amplifiers to other optical components	7	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	8	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	9	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Note 1: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.

Note 2: The OFA VGA has an integrated eVOA (electrically controlled variable optical attenuator). For this reason, a VOA is not required when an OFA VGA is used. An equalizer (PBE, APBE) may still be required.

Figure 2-22
DWDM pre-amp and post-amp site with either C-band or L-band WDM shelves using discrete VOAs

OM2306p

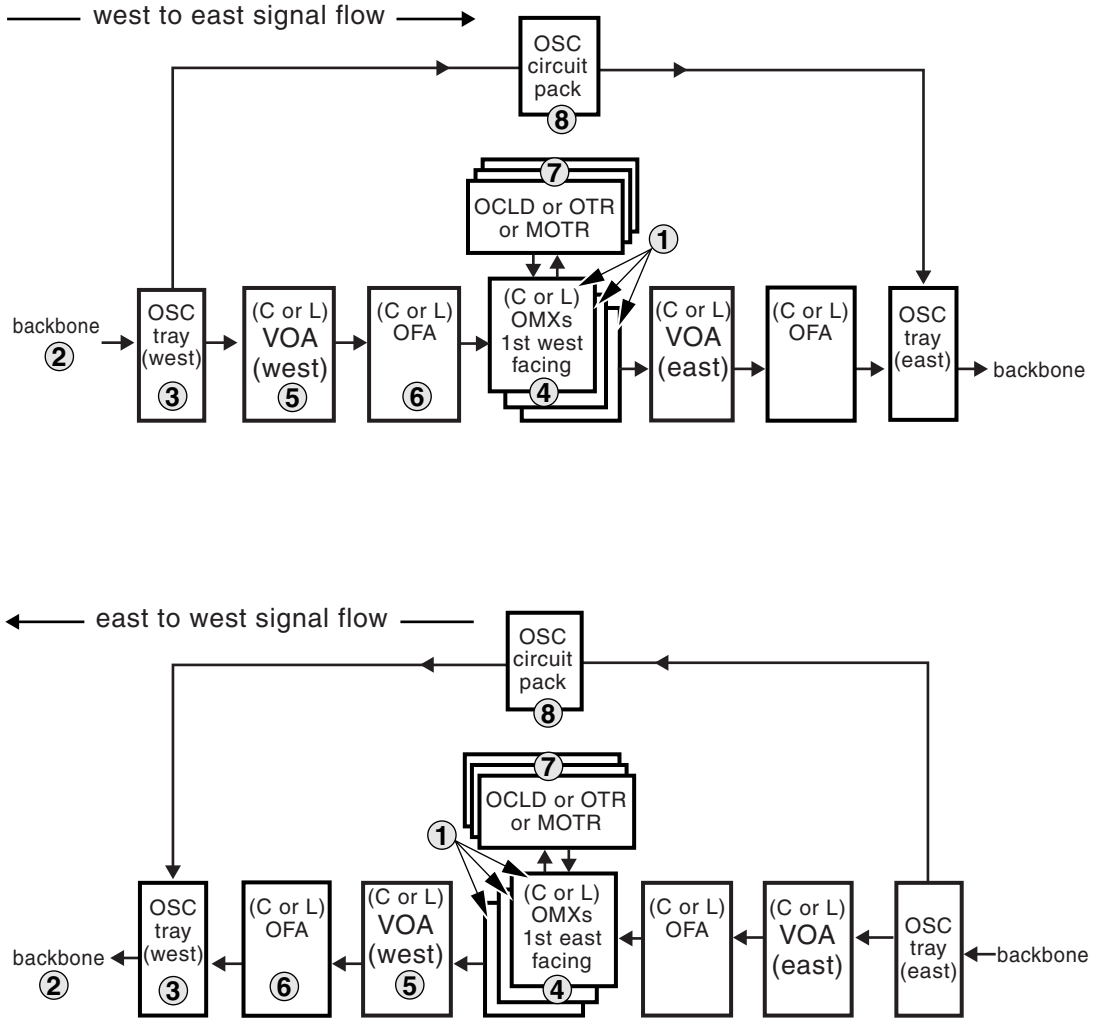


Table 2-23
Optical connections for a DWDM pre-amp and post-amp site with either C-band or L-band WDM shelves using discrete VOAs

Task	Label on figure	Procedure
Connect OMX modules (see Note 1)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the OMX to other optical components	4	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the discrete VOA to other optical components (see Note 2)	5	Procedure 3-10 Connecting Discrete VOAs
Connect the amplifiers to other optical components	6	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	7	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	8	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Note 1: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.

Note 2: The OFA VGA has an integrated eVOA (electrically controlled variable optical attenuator). For this reason, a VOA is not required when an OFA VGA is used. An equalizer (PBE, APBE) may still be required.

Figure 2-23
DWDM pre-amp and post-amp site with either C-band or L-band WDM shelves using discrete VOAs for pre-amp and APBEs for post-amp

OM2310p

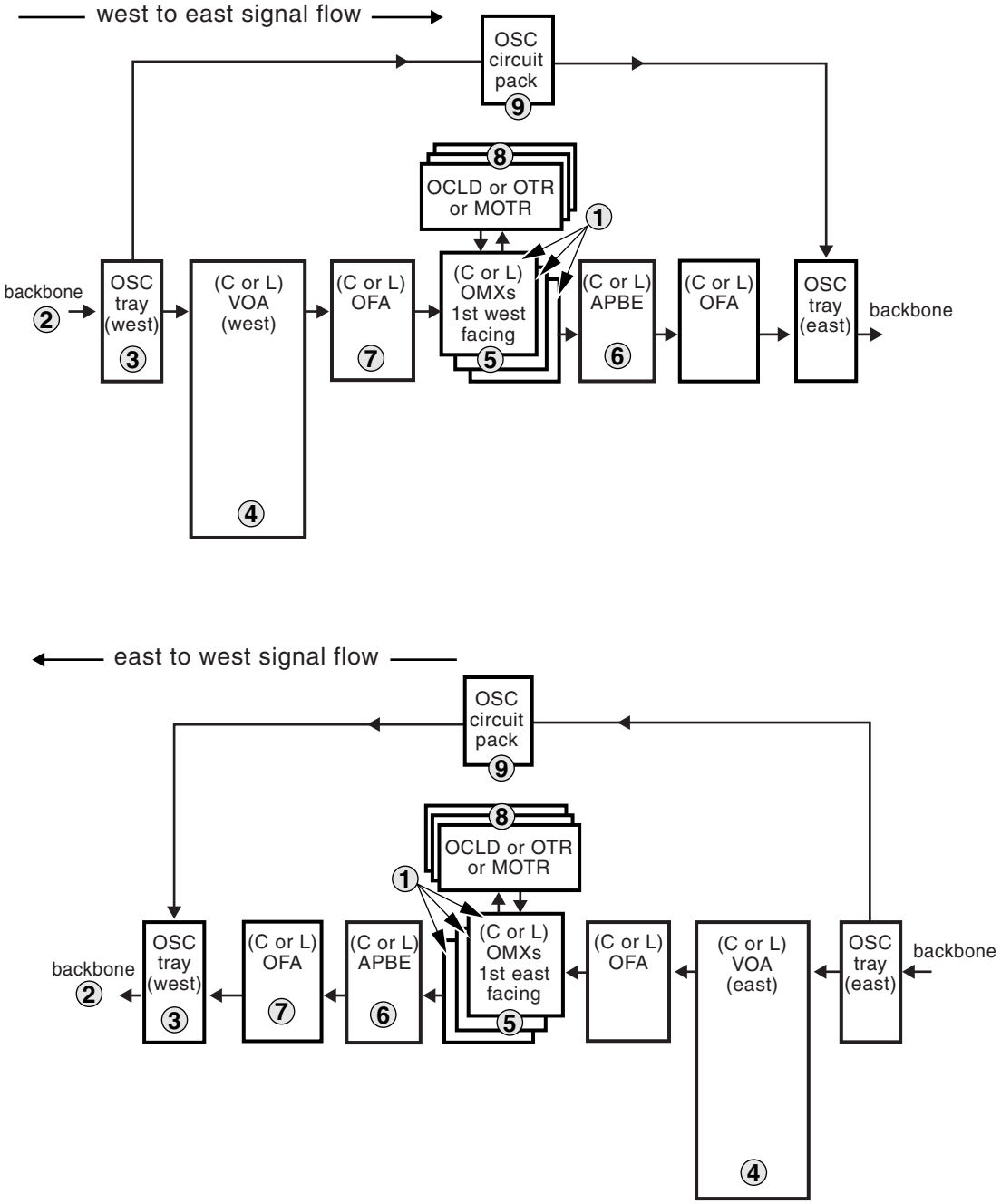


Table 2-24
Optical connections for a DWDM pre-amp and post-amp site with either C-band or L-band WDM shelves using discrete VOAs for pre-amp and APBEs for post-amp

Task	Label on figure	Procedure
Connect OMX modules (see Note1)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the discrete VOAs to other optical components (see Note 2)	4	Procedure 3-10 Connecting Discrete VOAs
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the APBE to other optical components	6	Procedure 3-9 Connecting APBEs on page 3-64
Connect the amplifiers to other optical components	7	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	8	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	9	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Note 1: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.

Note 2: The OFA VGA has an integrated eVOA (electrically controlled variable optical attenuator). For this reason, a VOA is not required when an OFA VGA is used. An equalizer (PBE, APBE) may still be required.

Figure 2-24
DWDM pre-amp and post-amp site with parallel WDM shelves using discrete VOAs for pre-amp and APBEs for post-amp

OM2308p

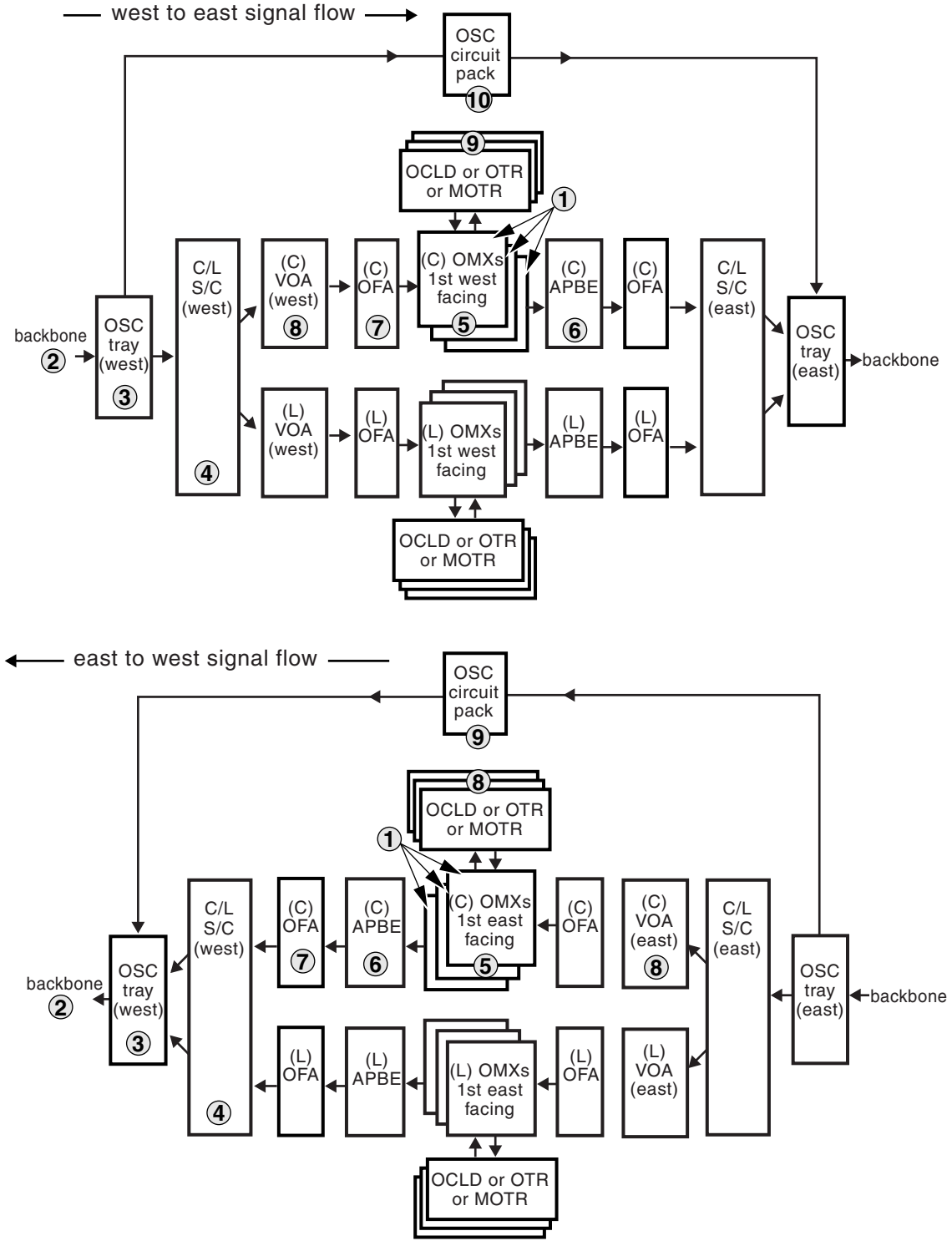


Table 2-25
Optical connections for a DWDM pre-amp and post-amp site with parallel WDM shelves using discrete VOAs for pre-amp and APBEs for post-amp

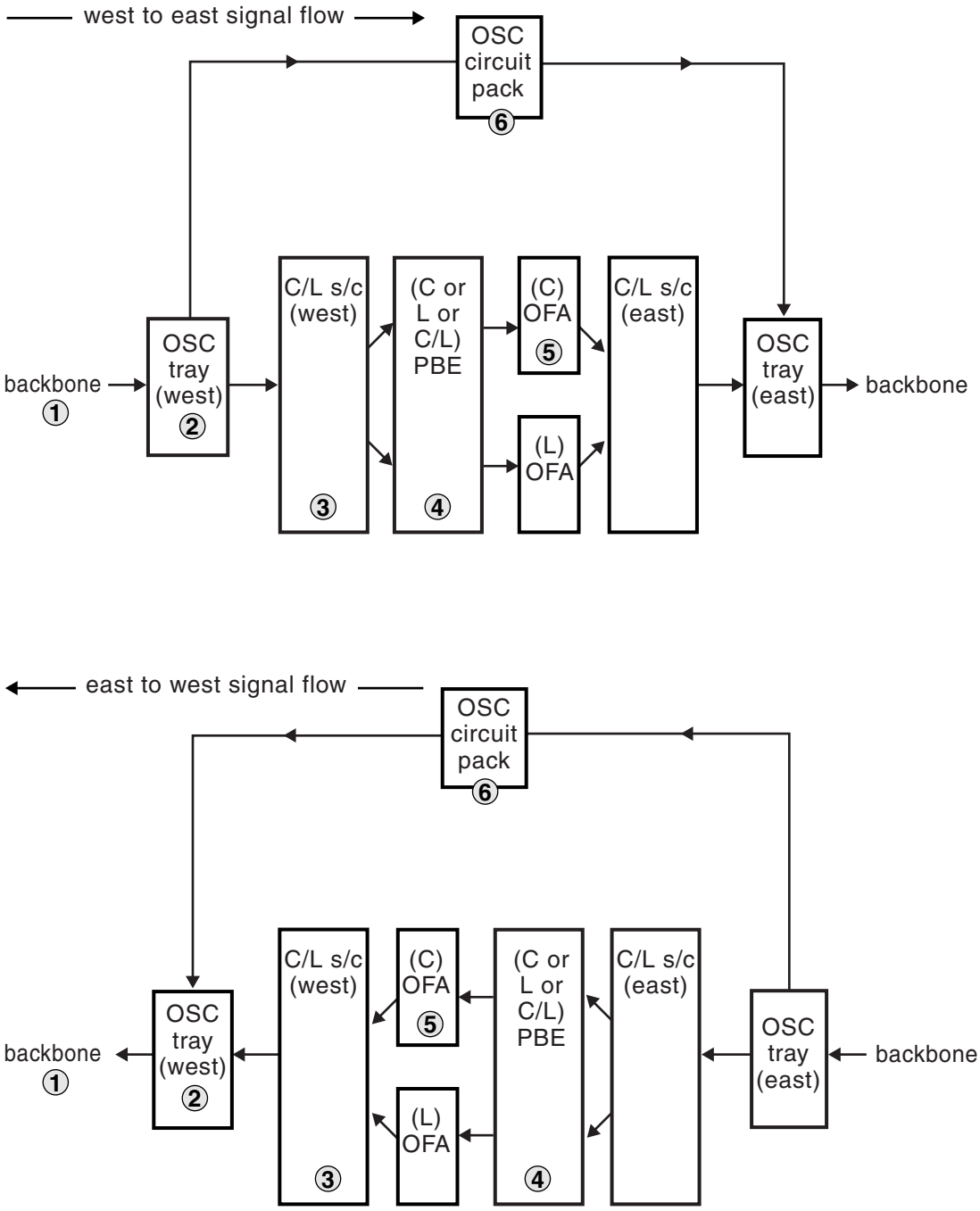
Task	Label on figure	Procedure
Connect OMX modules (see Note 1)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	4	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the APBE to other optical components	6	Procedure 3-9 Connecting APBEs on page 3-64
Connect the amplifiers to other optical components	7	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the discrete VOAs to other optical components (see Note 2)	8	Procedure 3-10 Connecting Discrete VOAs
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	9	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	10	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Note 1: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.

Note 2: The OFA VGA has an integrated eVOA (electrically controlled variable optical attenuator). For this reason, a VOA is not required when an OFA VGA is used. An equalizer (PBE, APBE) may still be required.

Figure 2-25
DWDM line-amp site using PBEs with bookended C&L splitter/couplers

OM1359p



Note: If the inbound signal in one direction comes directly from an upstream amplifier (i.e. the pre-amp in that direction is the second or subsequent amplifier in the chain with no OMXs in the chain), then there is no need for equalization of the signal into the pre-amplifier. Therefore, the C&L splitter/coupler and PBE associated with the pre-amplifier in that direction can be replaced with the NT0H31AD ECT.

Table 2-26
Optical connections for a DWDM line-amp site using PBEs with bookended C&L splitter/couplers

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	3	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the PBE to other optical components	4	Procedure 3-8 Connecting PBEs on page 3-60
Connect the amplifiers to other optical components	5	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OSC circuit pack	6	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Figure 2-26
DWDM line-amp site using APBEs with bookended C&L splitter/couplers

OM1361p

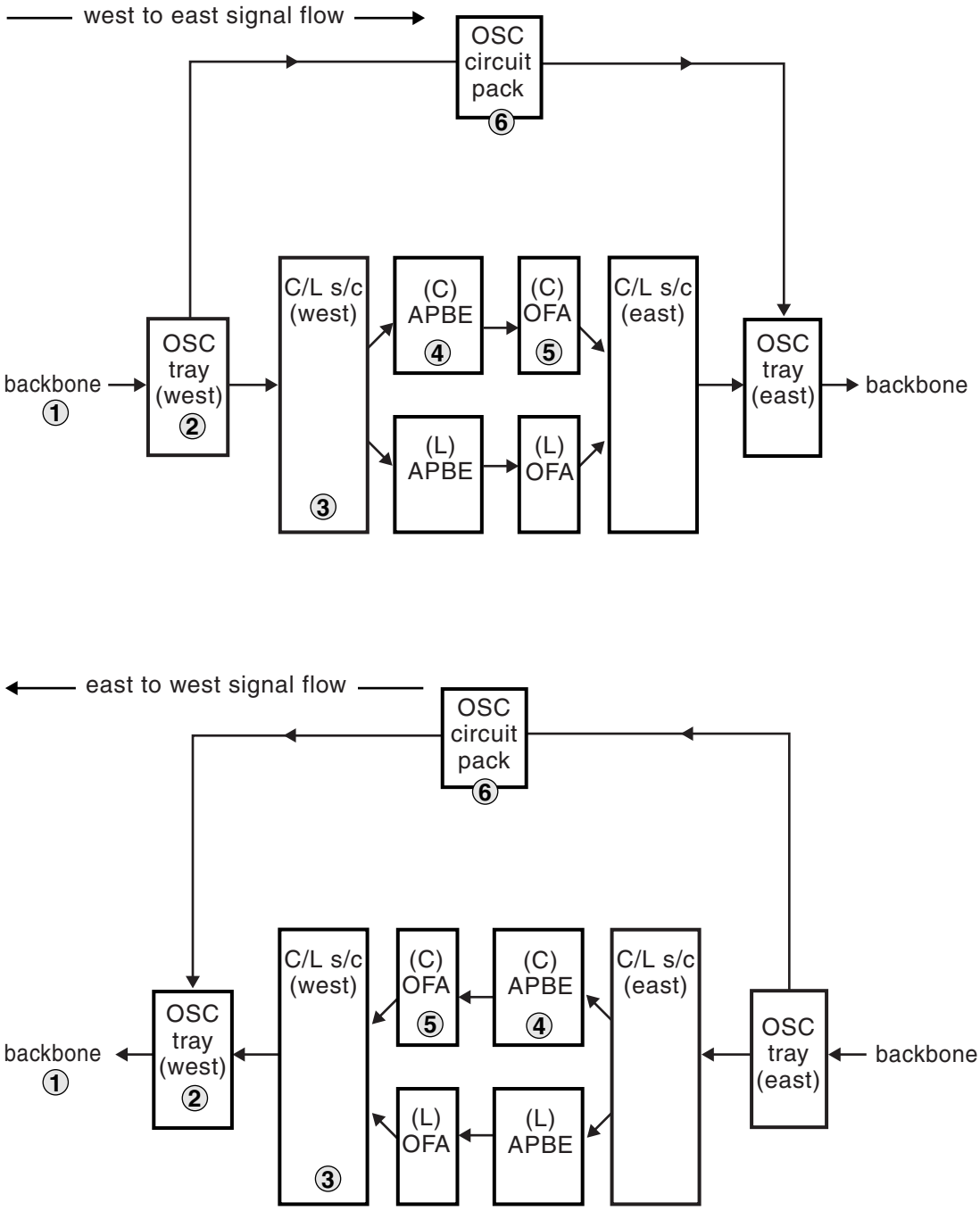


Table 2-27
Optical connections for a DWDM line-amp site using APBEs with bookended C&L splitter/couplers

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	3	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the APBE to other optical components	4	Procedure 3-9 Connecting APBEs on page 3-64
Connect the amplifiers to other optical components	5	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OSC circuit pack	6	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Figure 2-27
DWDM line-amp site with either C-band or L-band signals using discrete VOAs

OM2303p

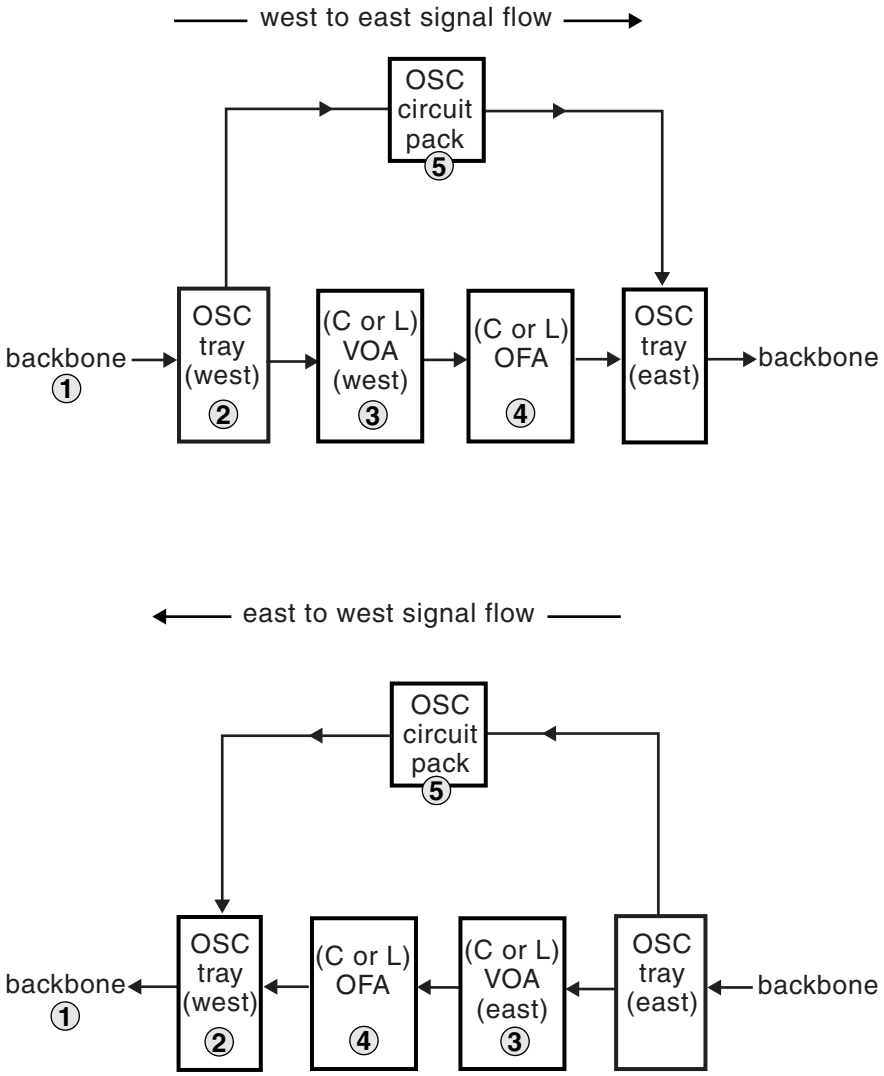


Table 2-28
Optical connections for a DWDM line-amp site with either C-band or L-band signals using discrete VOAs

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the discrete VOA to other optical components (see Note)	3	Procedure 3-10 Connecting Discrete VOAs
Connect the amplifiers to other optical components	4	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OSC circuit pack	5	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OFA VGA has an integrated eVOA (electrically controlled variable optical attenuator). For this reason, a VOA is not required when an OFA VGA is used. An equalizer (PBE, APBE) may still be required.		

Figure 2-28
DWDM line-amp site with either C-band or L-band signals using PBEs

EX1832p

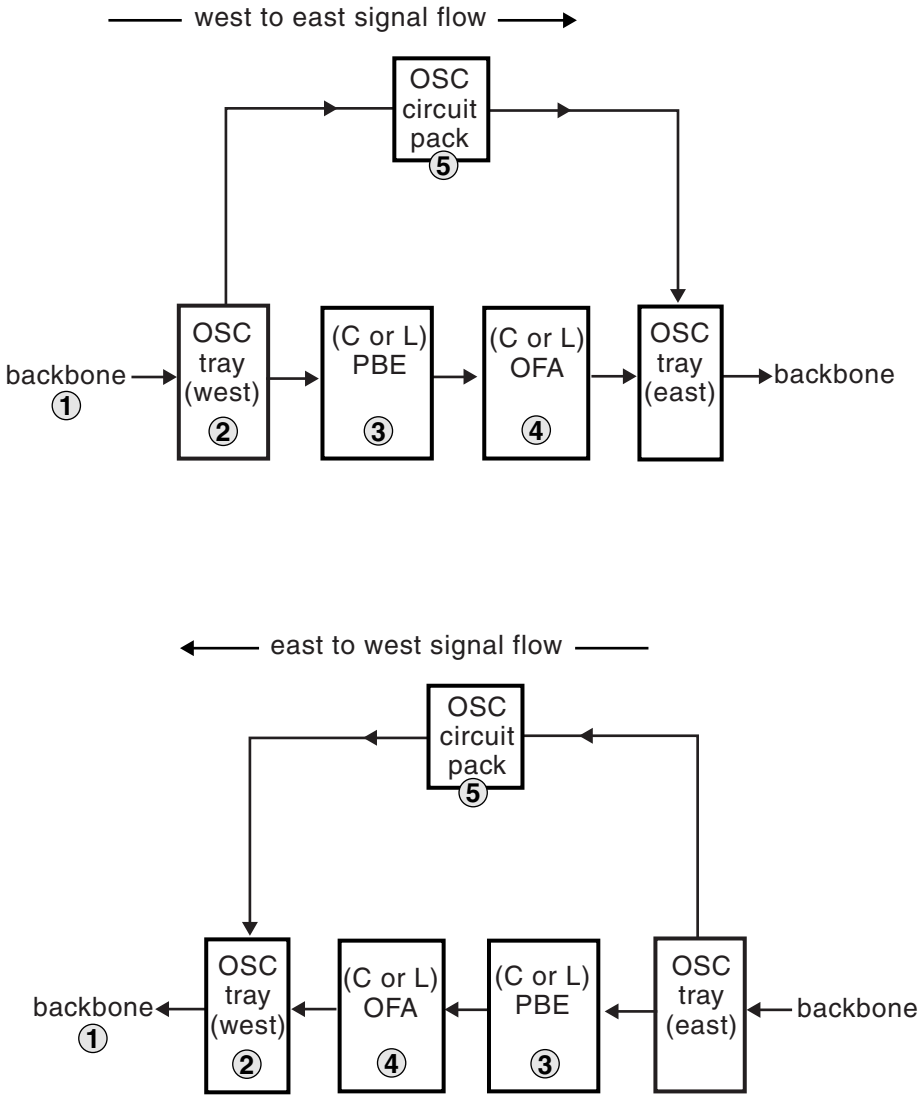


Table 2-29
Optical connections for a DWDM line-amp site with either C-band or L-band signals using PBEs

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the PBE to other optical components	3	Procedure 3-8 Connecting PBEs on page 3-60
Connect the amplifiers to other optical components	4	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OSC circuit pack	5	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Figure 2-29
DWDM line-amp site using discrete VOAs with bookended C/L splitter/couplers

OM2309p

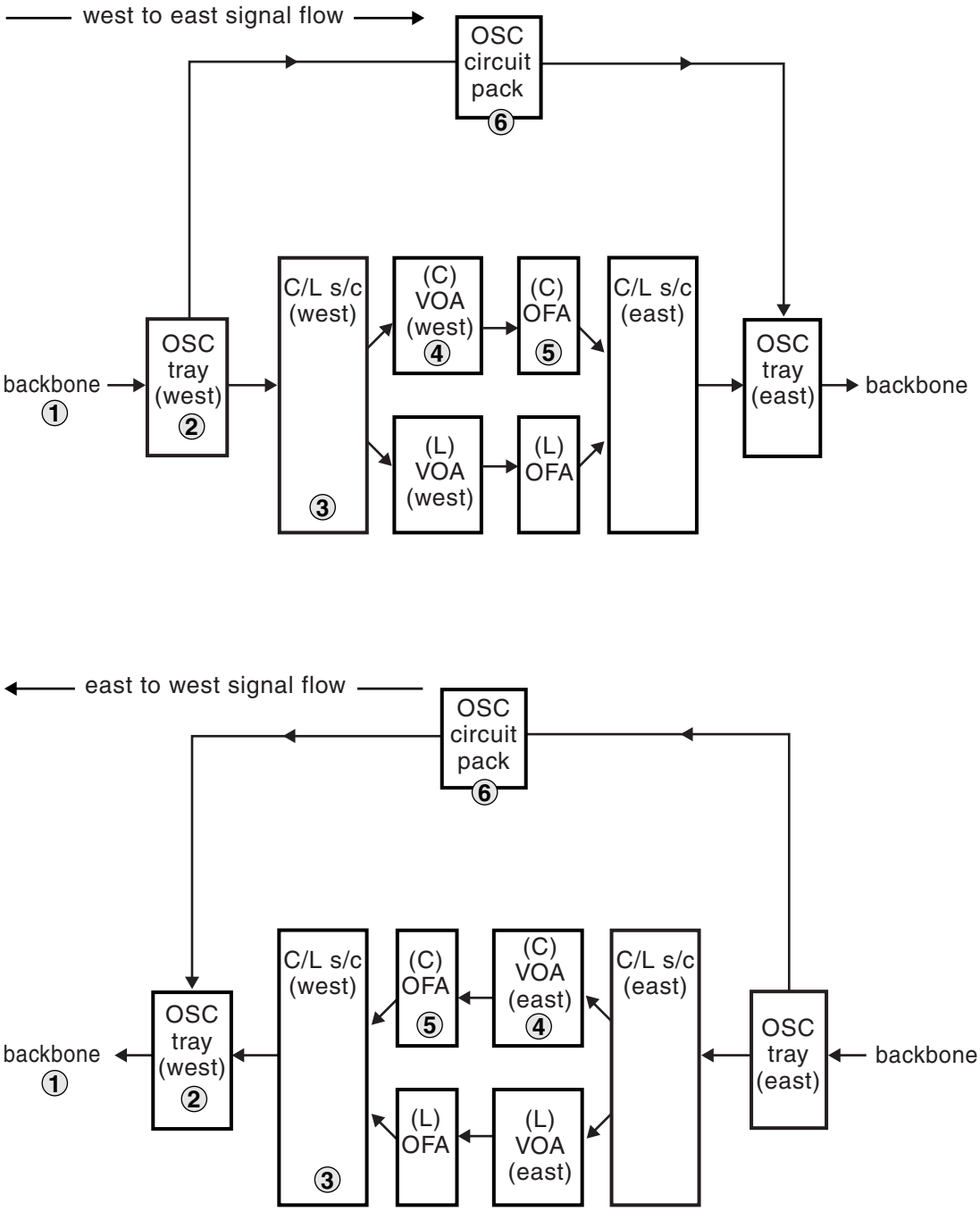


Table 2-30
Optical connections for a DWDM line-amp site using discrete VOAs with bookended C/L splitter/couplers

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	3	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the discrete VOA to other optical components (see Note)	4	Procedure 3-10 Connecting Discrete VOAs
Connect the amplifiers to other optical components	5	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OSC circuit pack	6	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OFA VGA has an integrated eVOA (electrically controlled variable optical attenuator). For this reason, a VOA is not required when an OFA VGA is used. An equalizer (PBE, APBE) may still be required.		

Figure 2-30
DWDM line-amp site with either C-band or L-band signals using APBEs

OM1817p

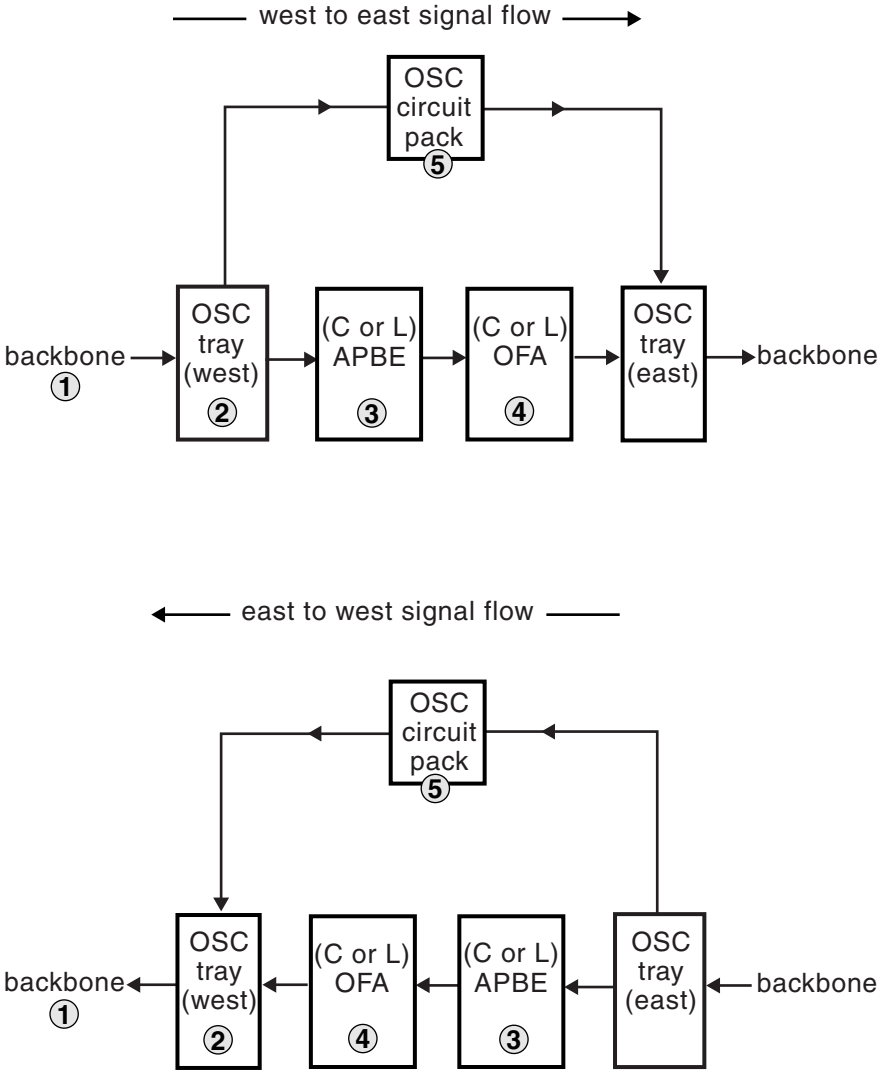


Table 2-31
Optical connections for a DWDM line-amp site with either C-band or L-band signals using APBEs

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the APBE to other optical components	3	Procedure 3-9 Connecting APBEs on page 3-64
Connect the amplifiers to other optical components	4	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OSC circuit pack	5	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Figure 2-31
DWDM line-amp site with either C-band or L-band signals using APBEs and discrete VOAs

OM2304p

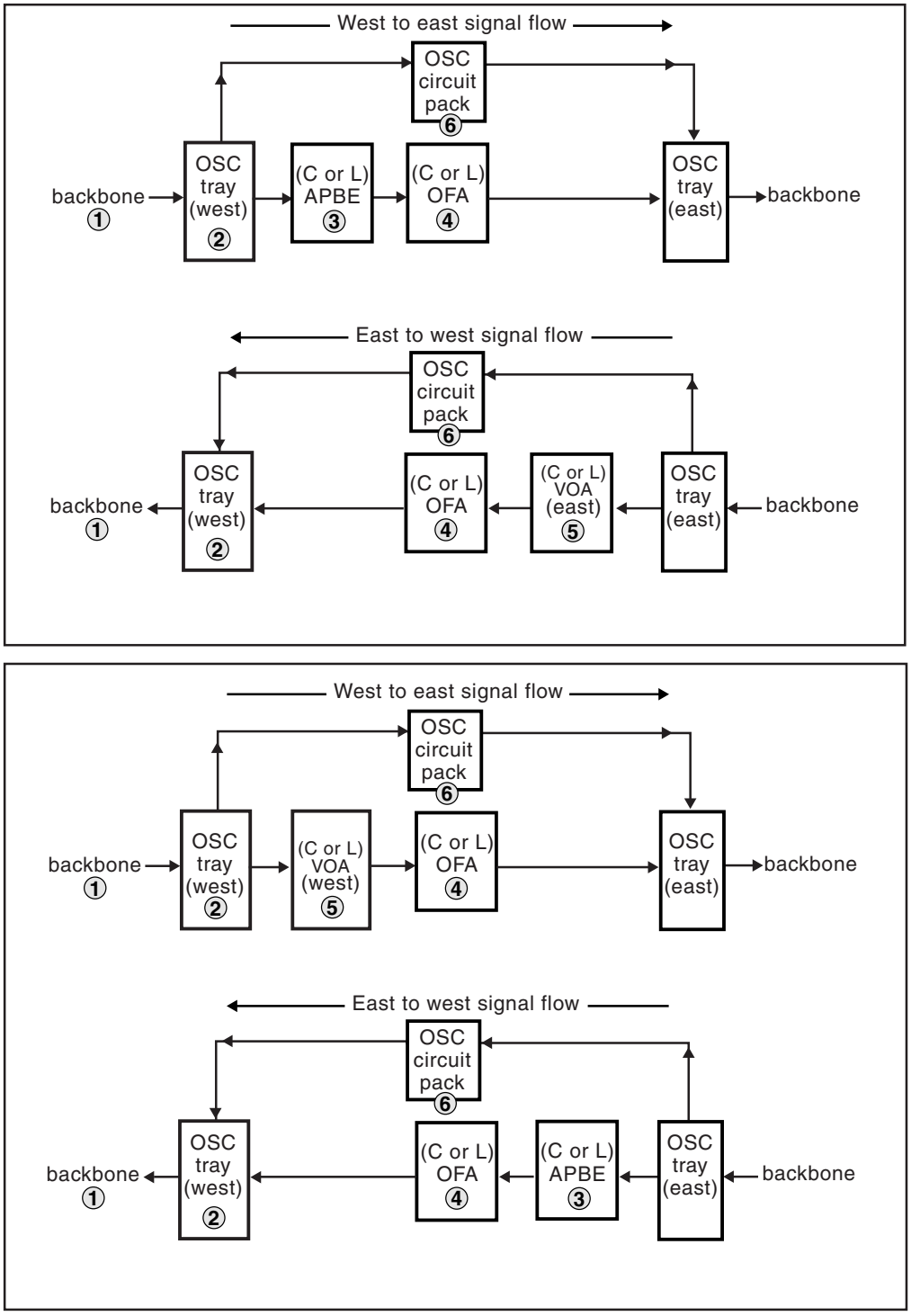


Table 2-32
Optical connections for a DWDM line-amp site with either C-band or L-band signals using APBEs and discrete VOAs

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the APBE to other optical components	3	Procedure 3-9 Connecting APBEs on page 3-64
Connect the amplifiers to other optical components	4	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the discrete VOA to other optical components (see Note)	5	Procedure 3-10 Connecting Discrete VOAs
Connect the OSC circuit pack	6	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OFA VGA has an integrated eVOA (electrically controlled variable optical attenuator). For this reason, a VOA is not required when an OFA VGA is used. An equalizer (PBE, APBE) may still be required.		

Figure 2-32
DWDM line-amp site using distributed equalization with bookended C&L splitter/couplers

OM1806p

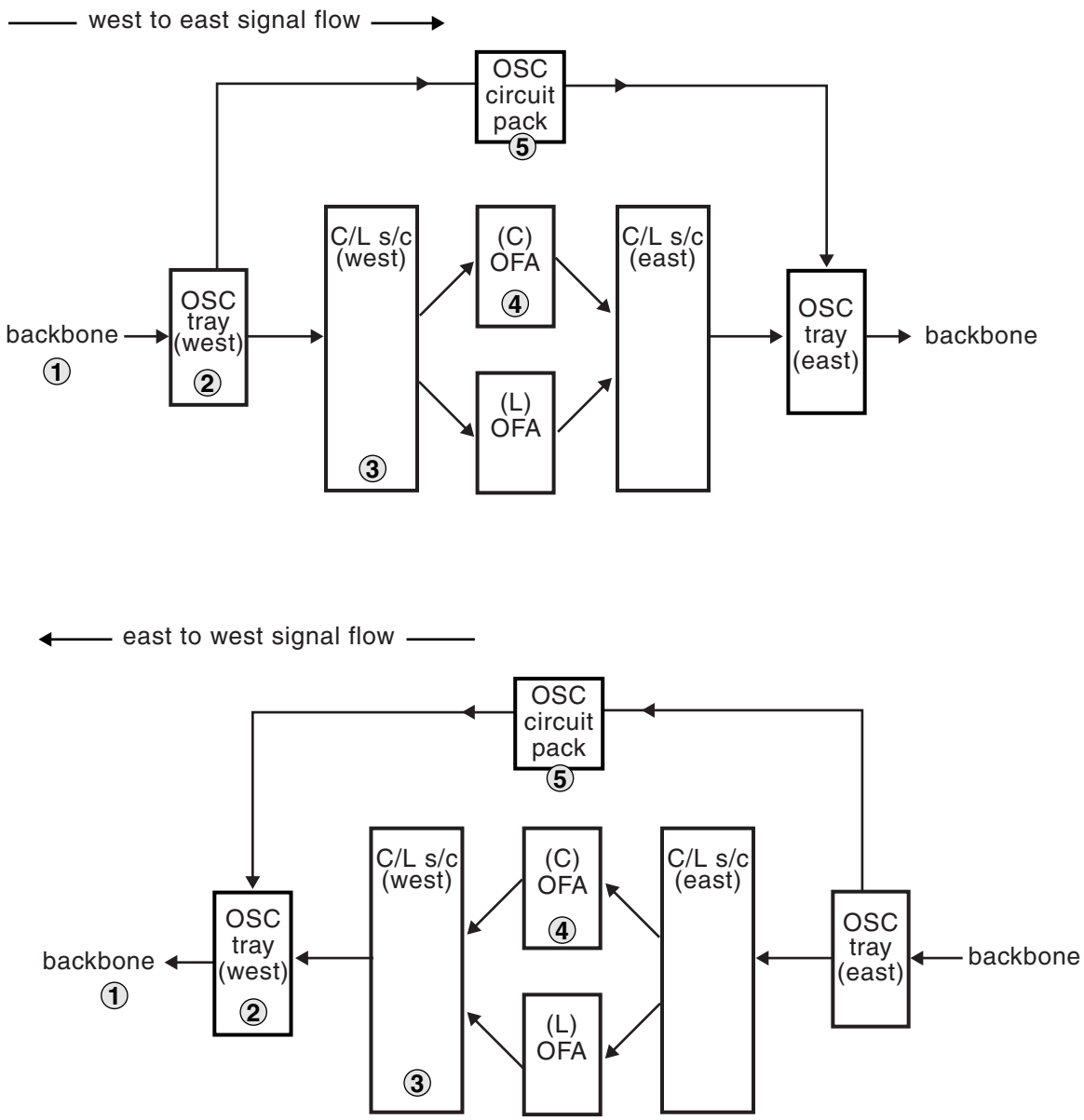


Table 2-33
Optical connections for a DWDM line-amp site using distributed equalization with bookended C&L splitter/couplers

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	3	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the amplifiers to other optical components	4	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OSC circuit pack	5	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Figure 2-33
DWDM line-amp site with either C-band or L-band WDM shelves using distributed equalization

OM1934p

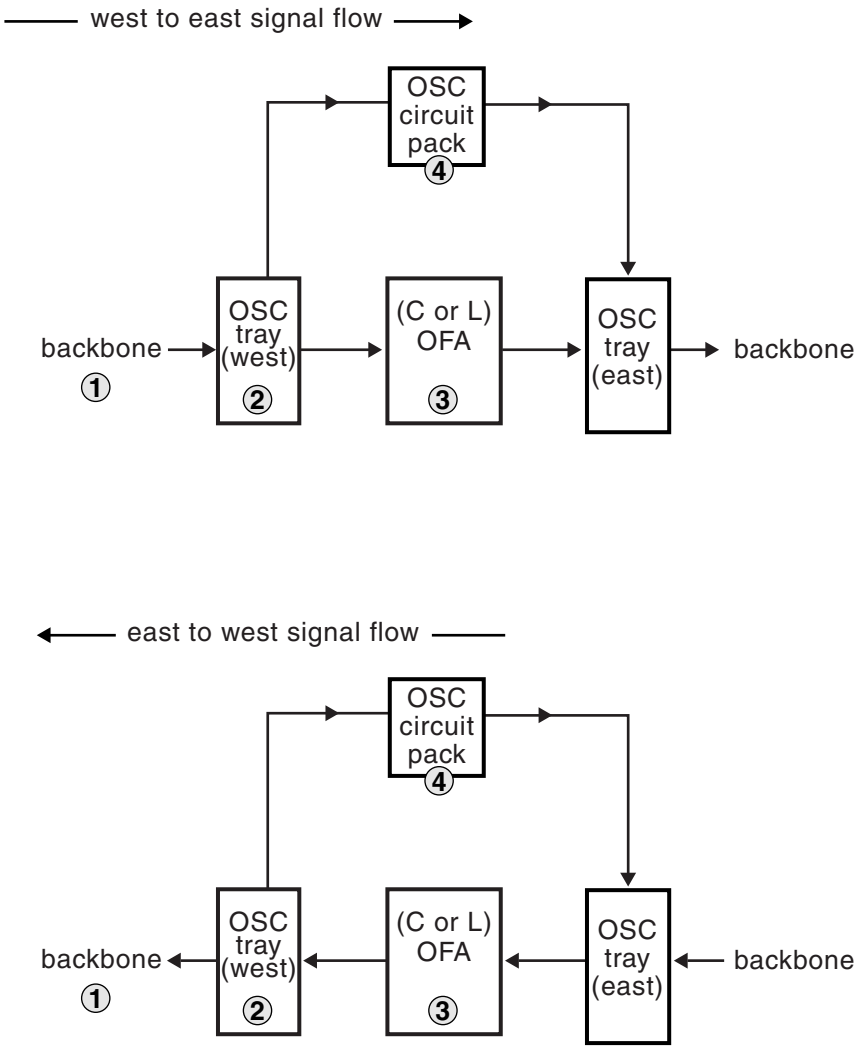


Table 2-34
Optical connections for a DWDM line-amp site with either C-band or L-band WDM shelves using distributed equalization

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the amplifiers to other optical components	3	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OSC circuit pack	4	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

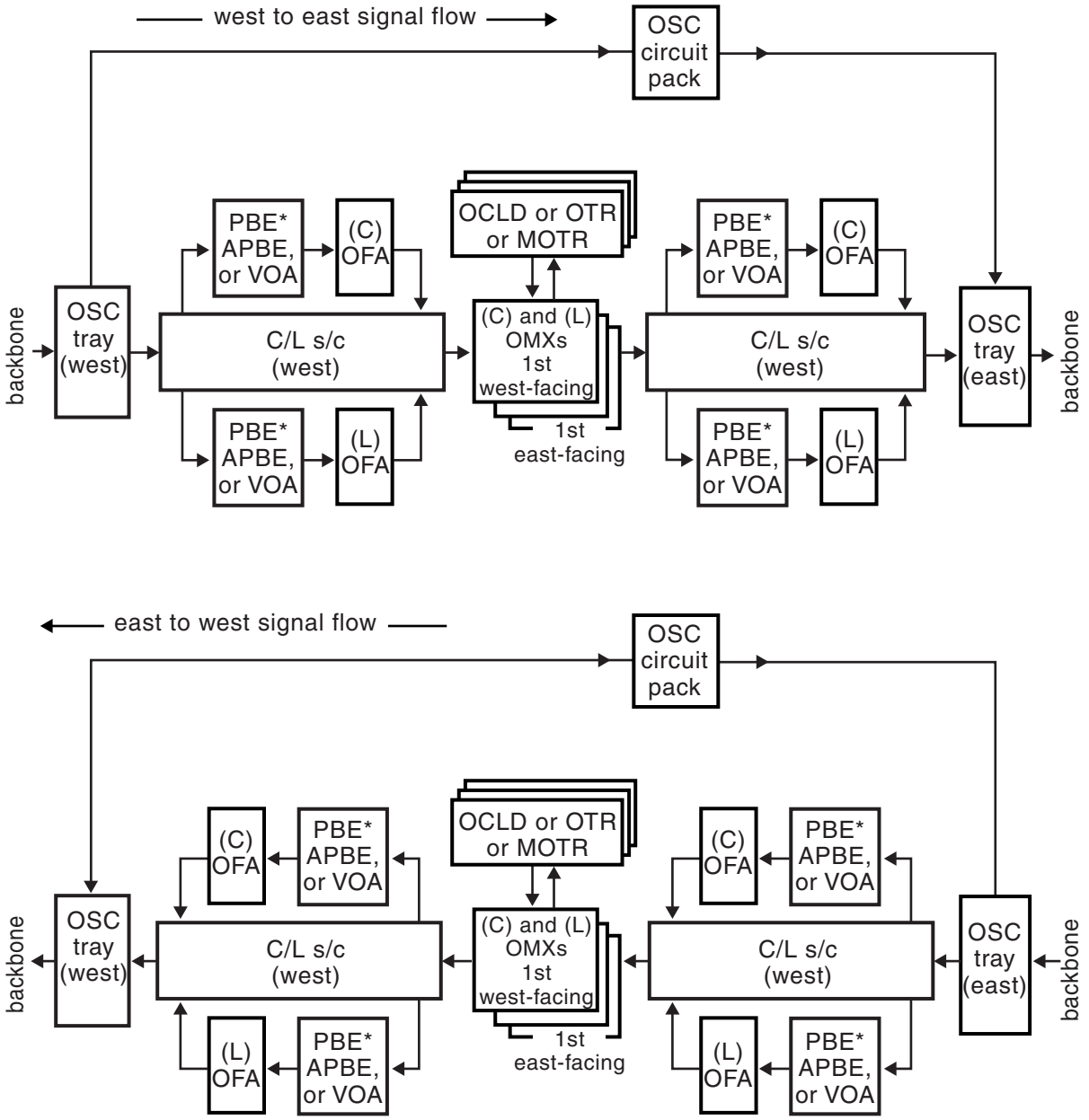
Serial configurations

Generic serial configuration

Figure 2-34 on page 2-73 shows a generic serial site configuration. All supported serial site configurations can be derived from this diagram. All of the possible components are included in this configuration; select only those components that are relevant to your site.

Figure 2-34
Generic serial site

OM2319p



* C-band and L-band PBE may be combined in one unit.

Table 2-35 lists all of the optical connections necessary to implement a serial site. Choose the procedures that apply to your site and see Part 2 of this book.

Table 2-35
Optical connections for a serial site

Task	Procedure
Connect OMX modules (see Note 1)	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect PBEs to other optical components	Procedure 3-8 Connecting PBEs
Connect APBEs to other optical components	Procedure 3-9 Connecting APBEs
Connect discrete VOAs to other optical components (see Note 2)	Procedure 3-10 Connecting Discrete VOAs
Connect amplifiers to other optical components	Procedure 3-11 Connecting OFA circuit packs
Connect the OMX to other optical components	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
	Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
	Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
	Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Note 1: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.

Note 2: The OFA VGA has an integrated eVOA (electrically controlled variable optical attenuator). For this reason, a VOA is not required when an OFA VGA is used. An equalizer (PBE, APBE) may still be required.

Site examples

Table 2-36 lists the examples of some specific serial site configurations. Use one example for each direction (east-to-west and west-to-east).

Table 2-36
Serial site examples

Example	Page
Unamplified DWDM or CWDM site with serial WDM shelves	2-76
DWDM pre-amp site with serial WDM shelves using PBEs with straddled C&L splitter/couplers	2-78
DWDM pre-amp site with serial WDM shelves using APBEs with straddled C&L splitter/couplers	2-80
DWDM pre-amp site with serial WDM shelves using discrete VOAs with straddled C&L splitter/couplers	2-82
DWDM pre-amp site with serial WDM shelves using distributed equalization	2-84
DWDM post-amp site with serial WDM shelves using PBEs with straddled C&L splitter/couplers	2-86
DWDM post-amp site with serial WDM shelves using APBEs with straddled C&L splitter/couplers	2-88
DWDM post-amp site with serial WDM shelves using discrete VOAs with straddled C&L splitter/couplers	2-90
DWDM post-amp site with serial WDM shelves using distributed equalization	2-92
DWDM line-amp site using PBEs with straddled C&L splitter/couplers	2-94
DWDM line-amp site using APBEs with straddled C&L splitter/couplers	2-96
DWDM line-amp site using discrete VOAs with straddled C&L splitter/couplers	2-98
DWDM line-amp site using distributed equalization with straddled C&L splitter/couplers	2-100

Figure 2-35
Unamplified DWDM or CWDM site with serial WDM shelves

OM1334p

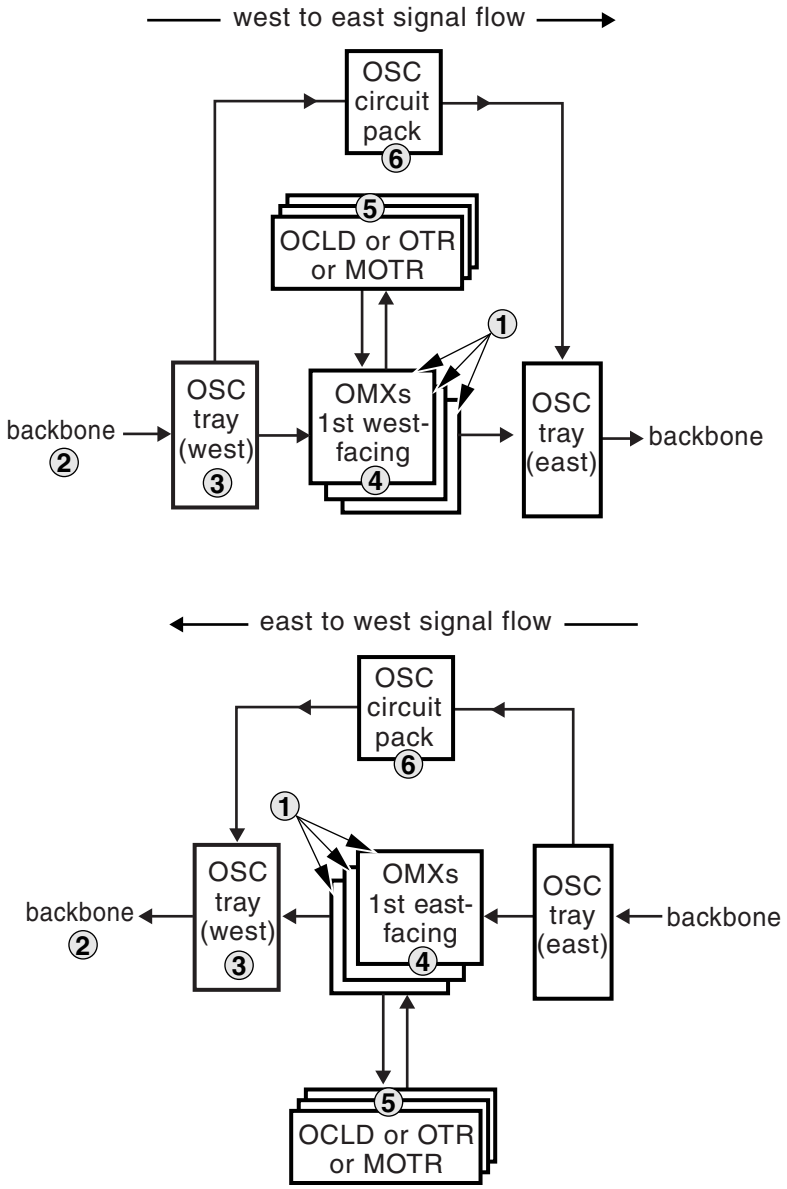


Table 2-37
Optical connections for an unamplified DWDM or CWDM site with serial WDM shelves

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the OMX to other optical components in the site	4	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	5	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	6	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-36
DWDM pre-amp site with serial WDM shelves using PBEs with straddled C&L splitter/couplers

OM1350p

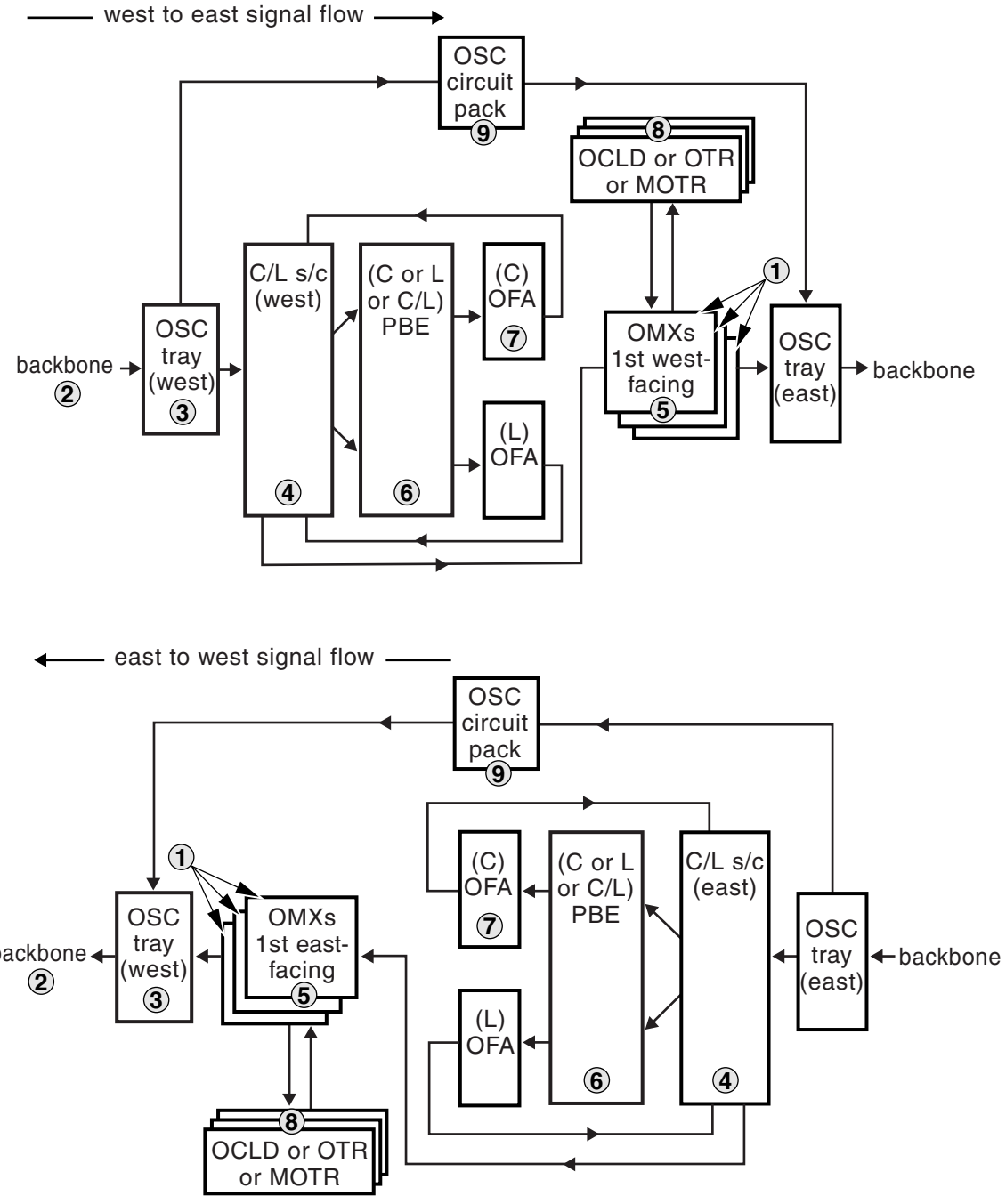


Table 2-38
Optical connections for a DWDM pre-amp site with serial WDM shelves using PBEs with straddled C&L splitter/couplers

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	4	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the PBE	6	Procedure 3-8 Connecting PBEs on page 3-60
Connect the amplifiers to other optical components	7	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	8	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	9	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-37
DWDM pre-amp site with serial WDM shelves using APBEs with straddled C&L splitter/couplers

OM1352p

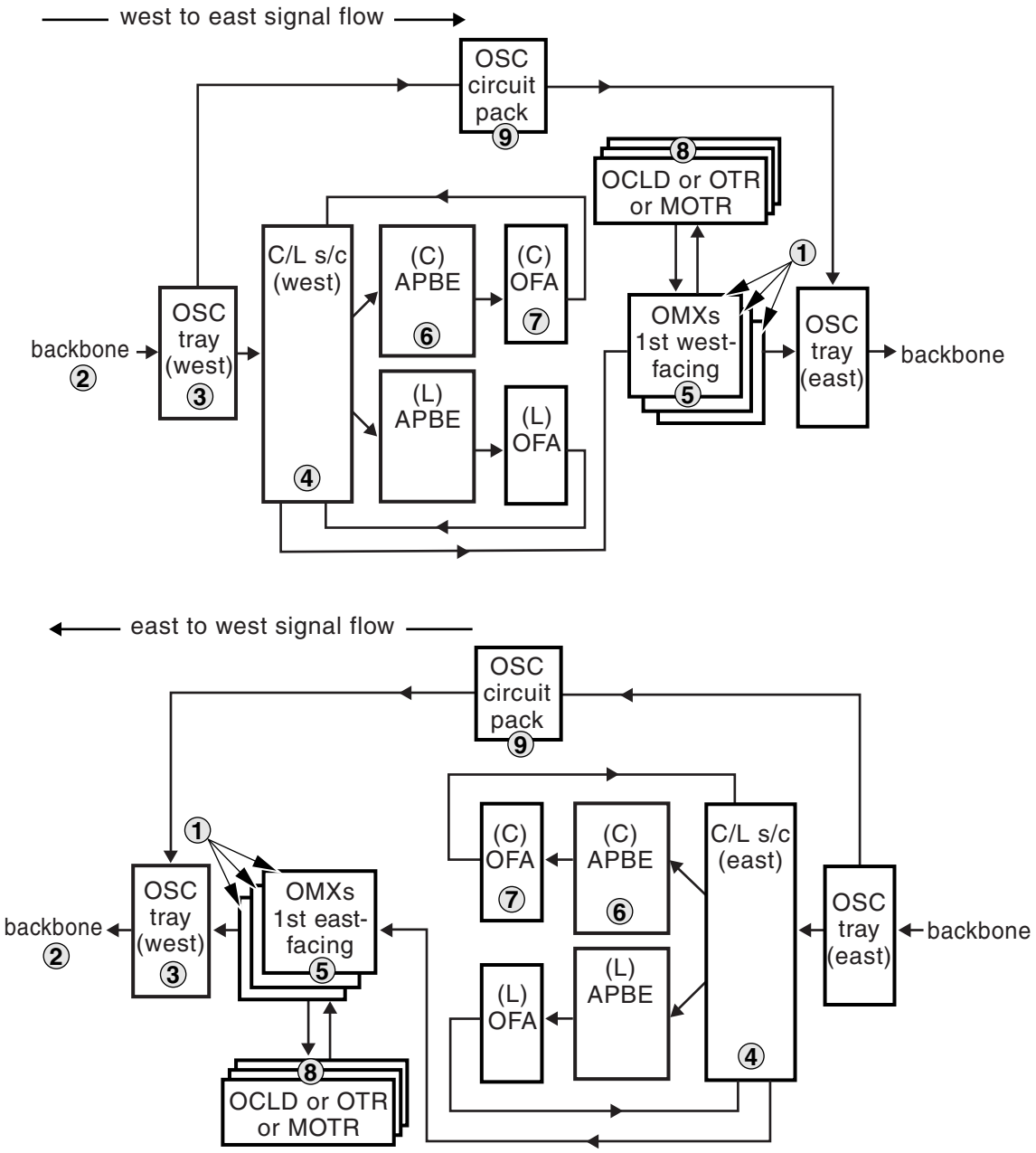


Table 2-39
Optical connections for a DWDM pre-amp site with serial WDM shelves using APBEs with straddled C&L splitter/couplers

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	4	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the APBE	6	Procedure 3-9 Connecting APBEs on page 3-64
Connect the amplifiers to other optical components	7	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	8	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	9	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-38
DWDM pre-amp site with serial WDM shelves using discrete VOAs with straddled C&L splitter/couplers

OM2297p

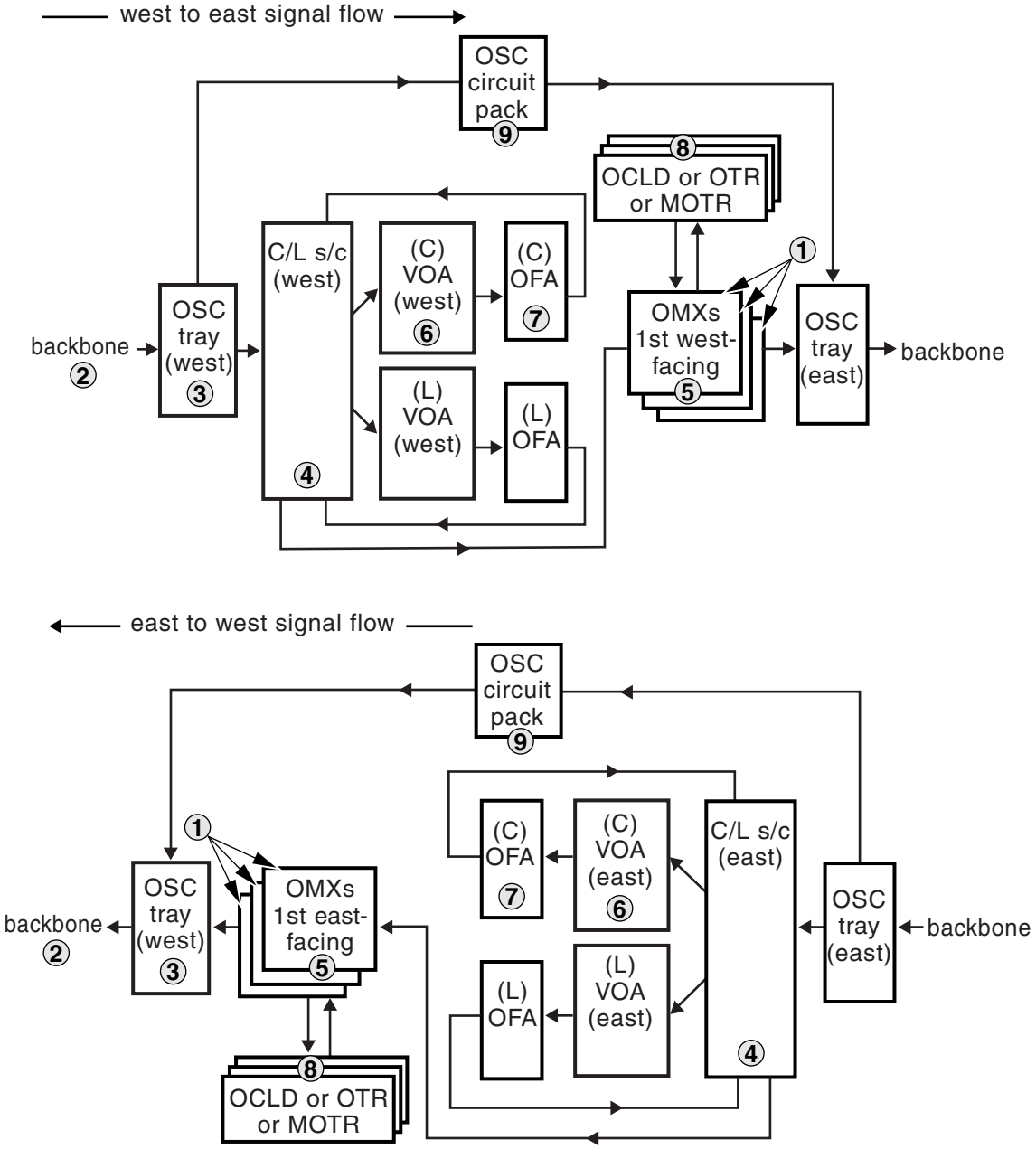


Table 2-40
Optical connections for a DWDM pre-amp site with serial WDM shelves using discrete VOAs with straddled C&L splitter/couplers

Task	Label on figure	Procedure
Connect OMX modules (see Note 1)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	4	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the discrete VOAs to other optical components (see Note 2)	6	Procedure 3-10 Connecting Discrete VOAs
Connect the amplifiers to other optical components	7	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	8	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	9	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Note 1: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.

Note 2: The OFA VGA has an integrated eVOA (electrically controlled variable optical attenuator). For this reason, a VOA is not required when an OFA VGA is used. An equalizer (PBE, APBE) may still be required.

Figure 2-39
DWDM pre-amp site with serial WDM shelves using distributed equalization

OM1809

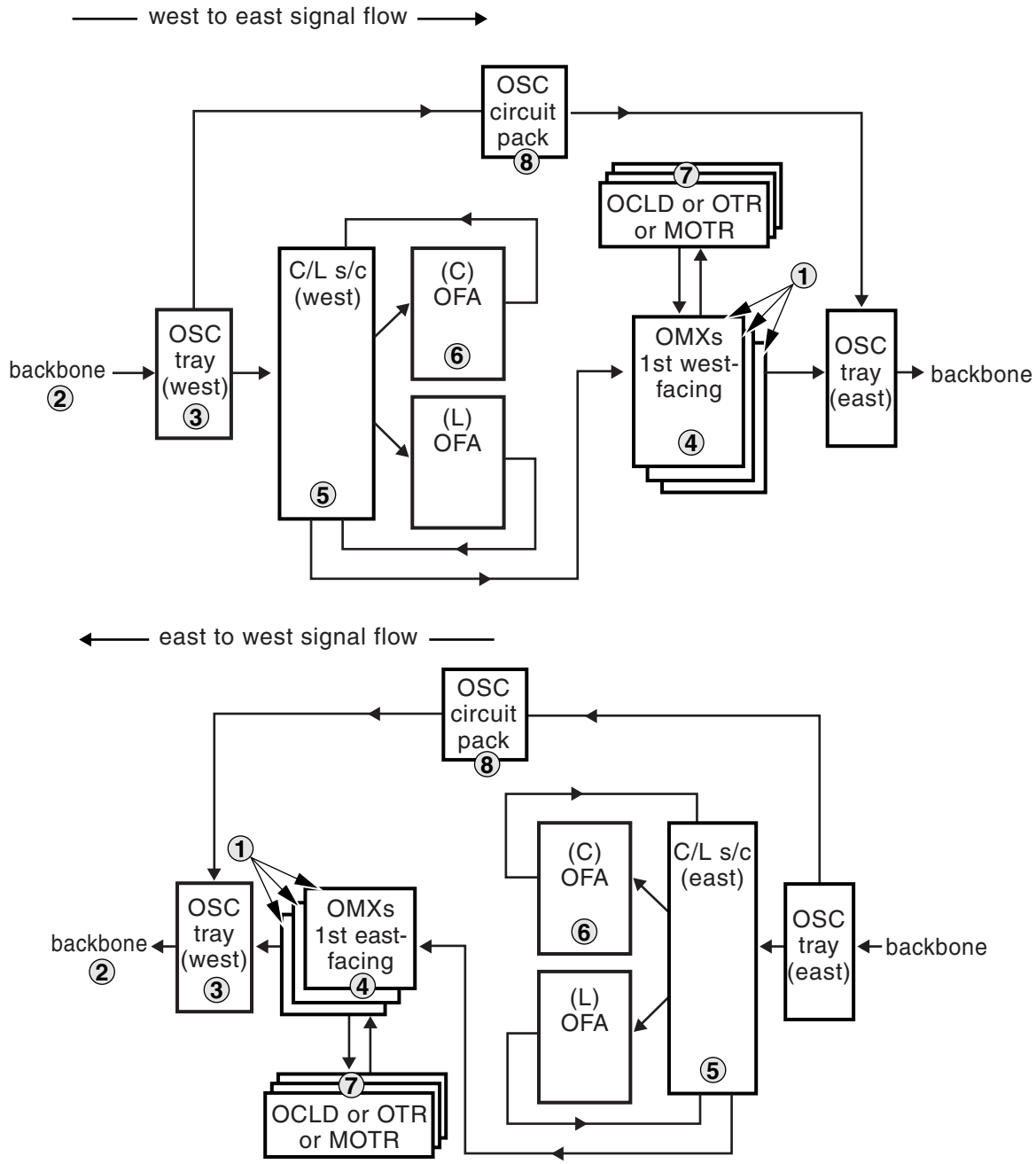


Table 2-41
Optical connections for a DWDM pre-amp site with serial WDM shelves using distributed equalization

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the OMX to other optical components	4	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect C&L splitter/couplers to other optical components	5	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the amplifiers to other optical components	6	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	7	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	8	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-40
DWDM post-amp site with serial WDM shelves using PBEs with straddled C&L splitter/couplers

OM1341p

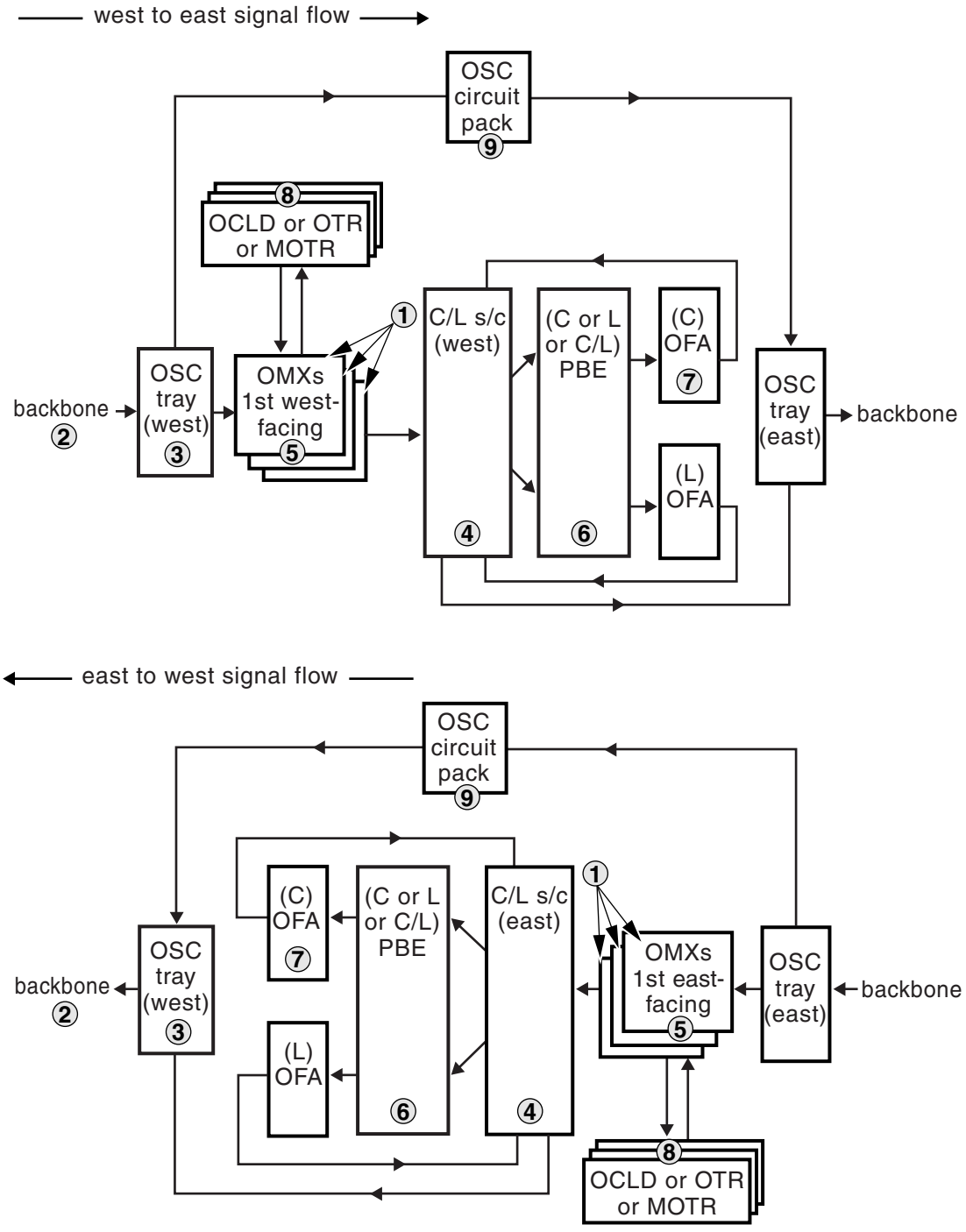


Table 2-42
Optical connections for a DWDM post-amp site with serial WDM shelves using PBEs with straddled C&L splitter/couplers

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	4	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the PBE to other optical components	6	Procedure 3-8 Connecting PBEs on page 3-60
Connect the amplifiers to other optical components	7	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	8	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	9	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-41
DWDM post-amp site with serial WDM shelves using APBEs with straddled C&L splitter/couplers
OM1342p

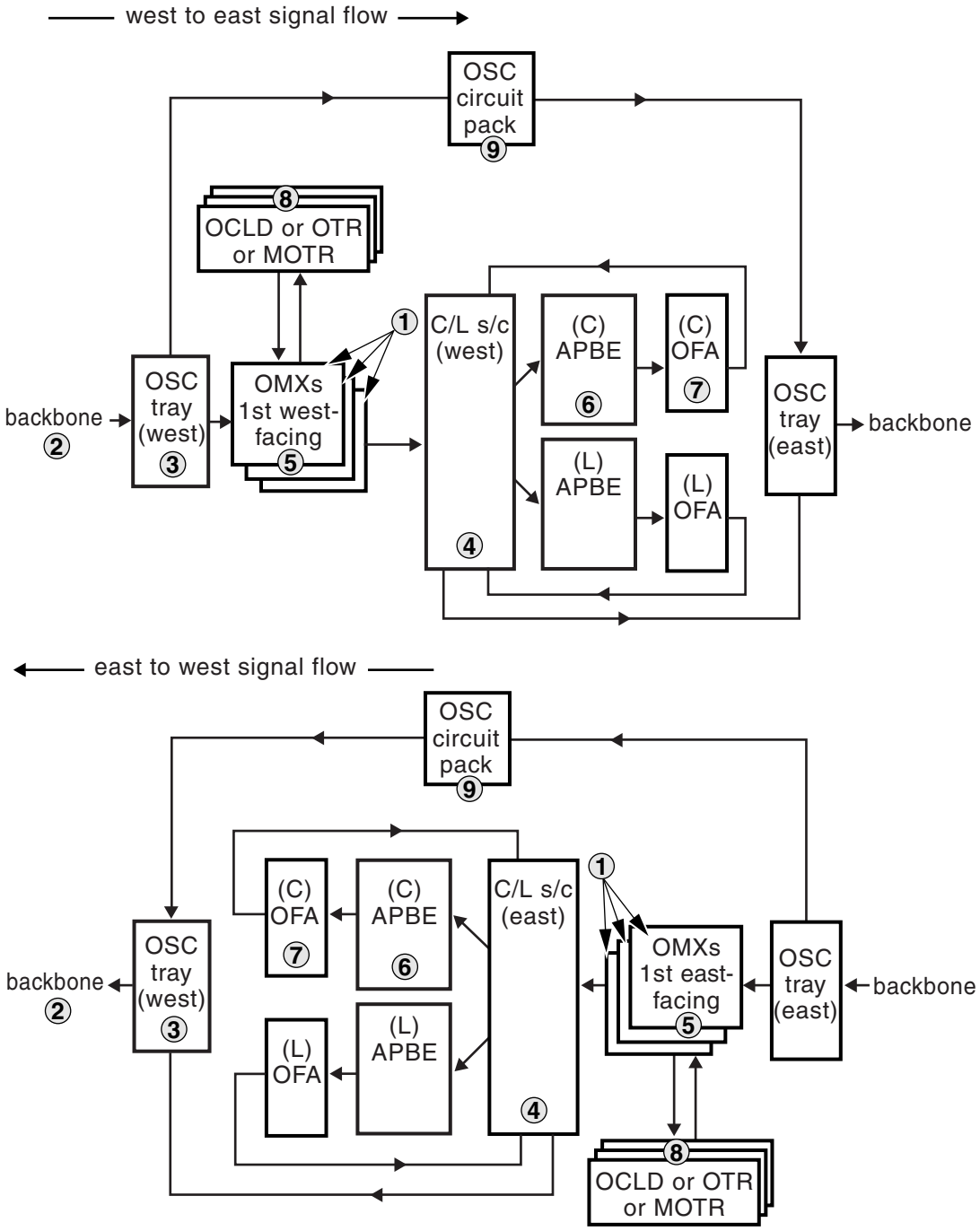


Table 2-43
Optical connections for a DWDM post-amp site with serial WDM shelves using APBEs with straddled C&L splitter/couplers

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	4	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the APBE to other optical components	6	Procedure 3-9 Connecting APBEs on page 3-64
Connect the amplifiers to other optical components	7	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	8	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	9	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-42
DWDM post-amp site with serial WDM shelves using discrete VOAs with straddled C&L splitter/couplers

OM2300p

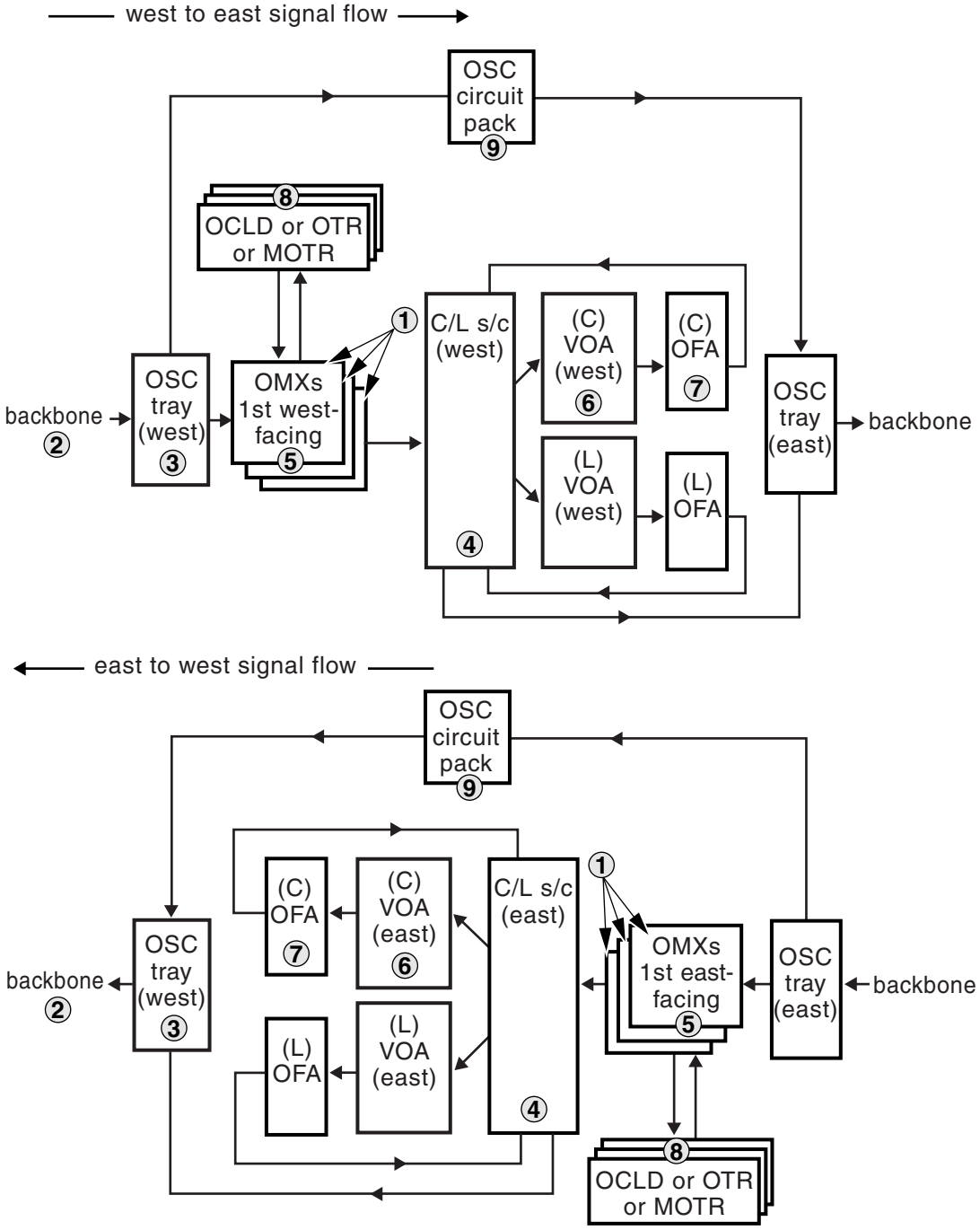


Table 2-44
Optical connections for a DWDM post-amp site with serial WDM shelves using discrete VOAs with straddled C&L splitter/couplers

Task	Label on figure	Procedure
Connect OMX modules (see Note 1)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	4	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the discrete VOAs to other optical components (see Note 2)	6	Procedure 3-10 Connecting Discrete VOAs
Connect the amplifiers to other optical components	7	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	8	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	9	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Note 1: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.

Note 2: The OFA VGA has an integrated eVOA (electrically controlled variable optical attenuator). For this reason, a VOA is not required when an OFA VGA is used. An equalizer (PBE, APBE) may still be required.

Figure 2-43
DWDM post-amp site with serial WDM shelves using distributed equalization

OM1814p

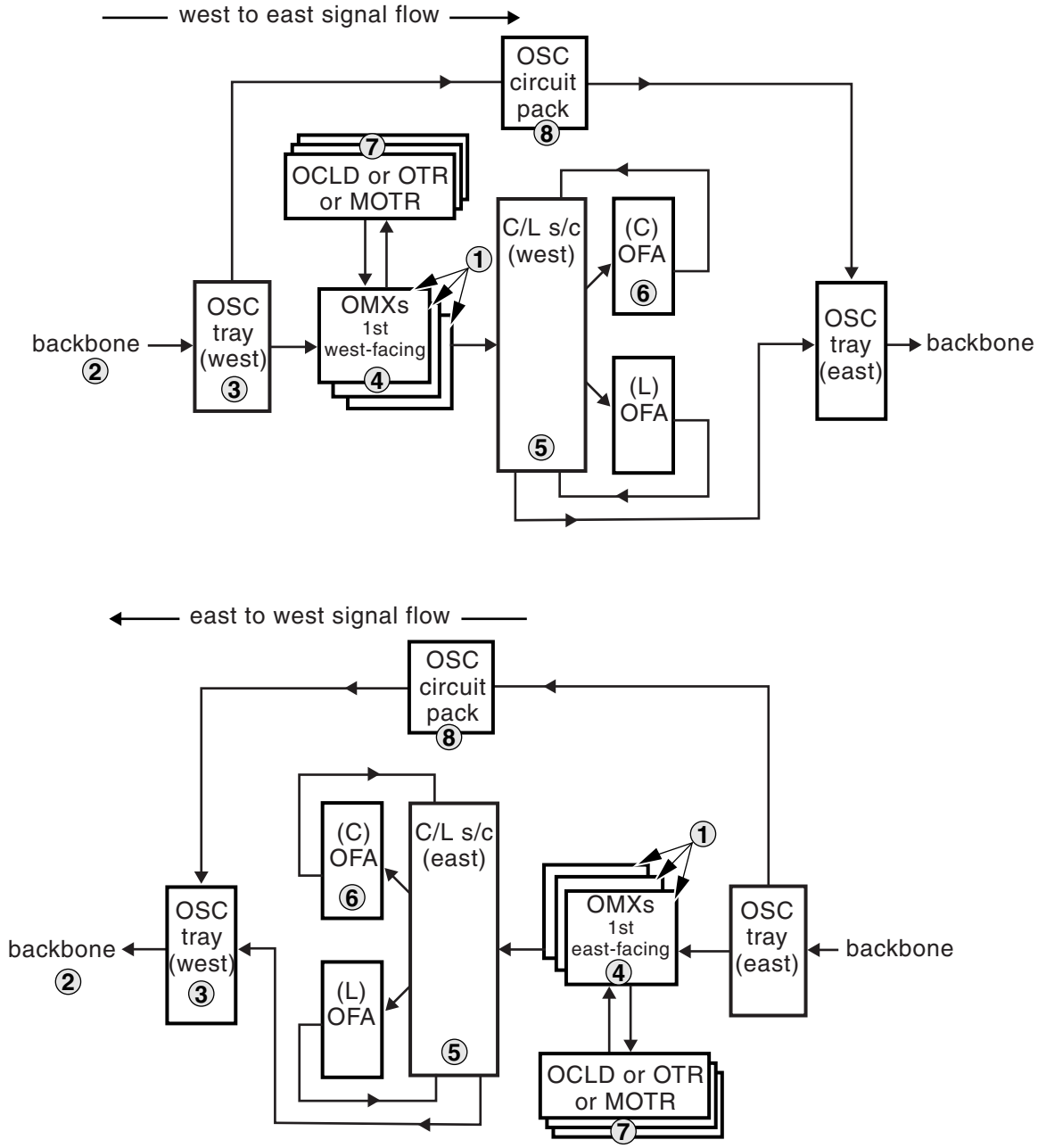


Table 2-45
Optical connections for a DWDM post-amp site with serial WDM shelves using distributed equalization

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the OMX to other optical components	4	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect C&L splitter/couplers to other optical components	5	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the amplifiers to other optical components	6	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	7	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	8	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-44
DWDM line-amp site using PBEs with straddled C&L splitter/couplers

OM1360p

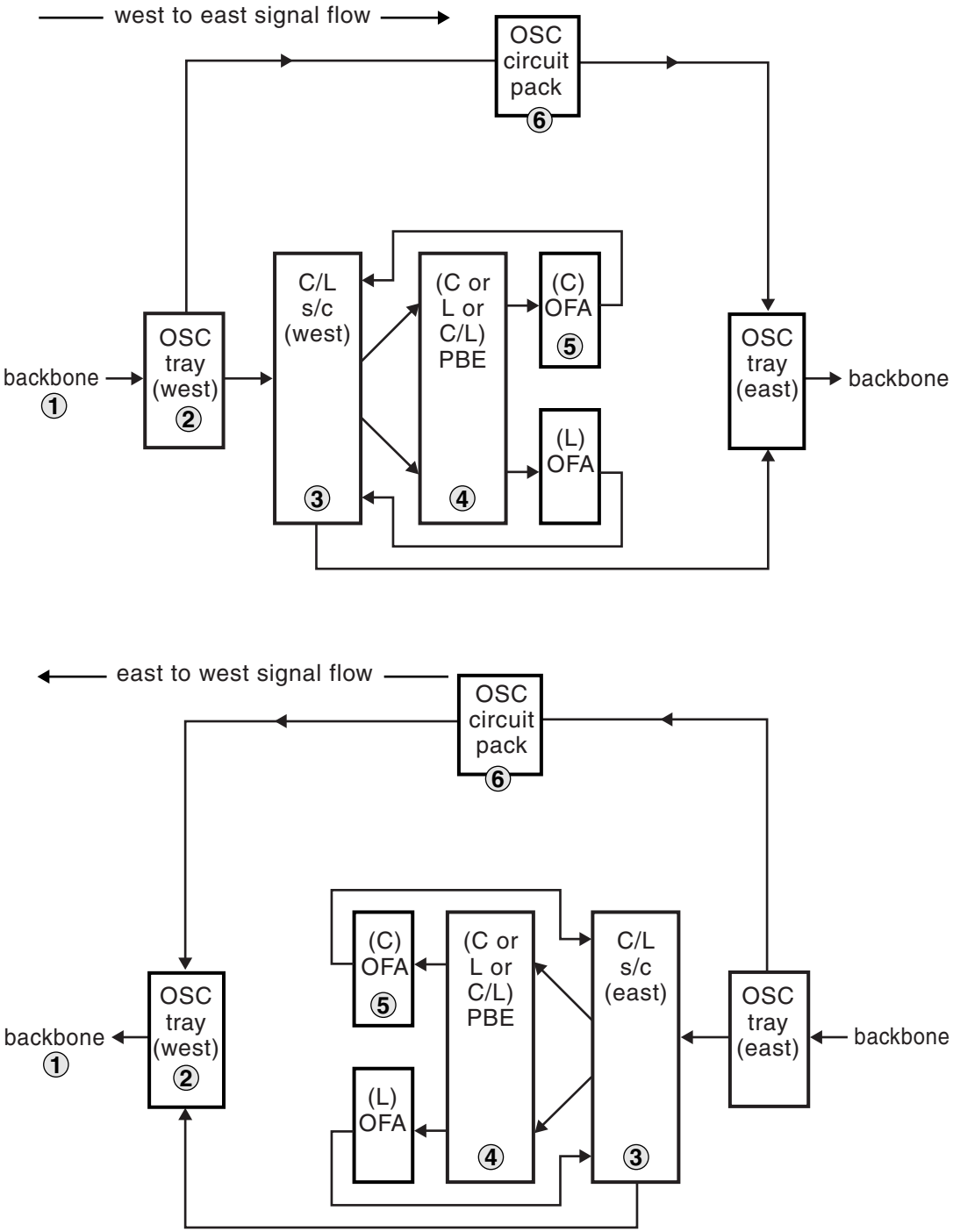


Table 2-46
Optical connections for a DWDM line-amp site using PBEs with straddled C&L splitter/couplers

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	3	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the PBE to other optical components	4	Procedure 3-8 Connecting PBEs on page 3-60
Connect the amplifiers to other optical components	5	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OSC circuit pack	6	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Figure 2-45
DWDM line-amp site using APBEs with straddled C&L splitter/couplers

OM1320p

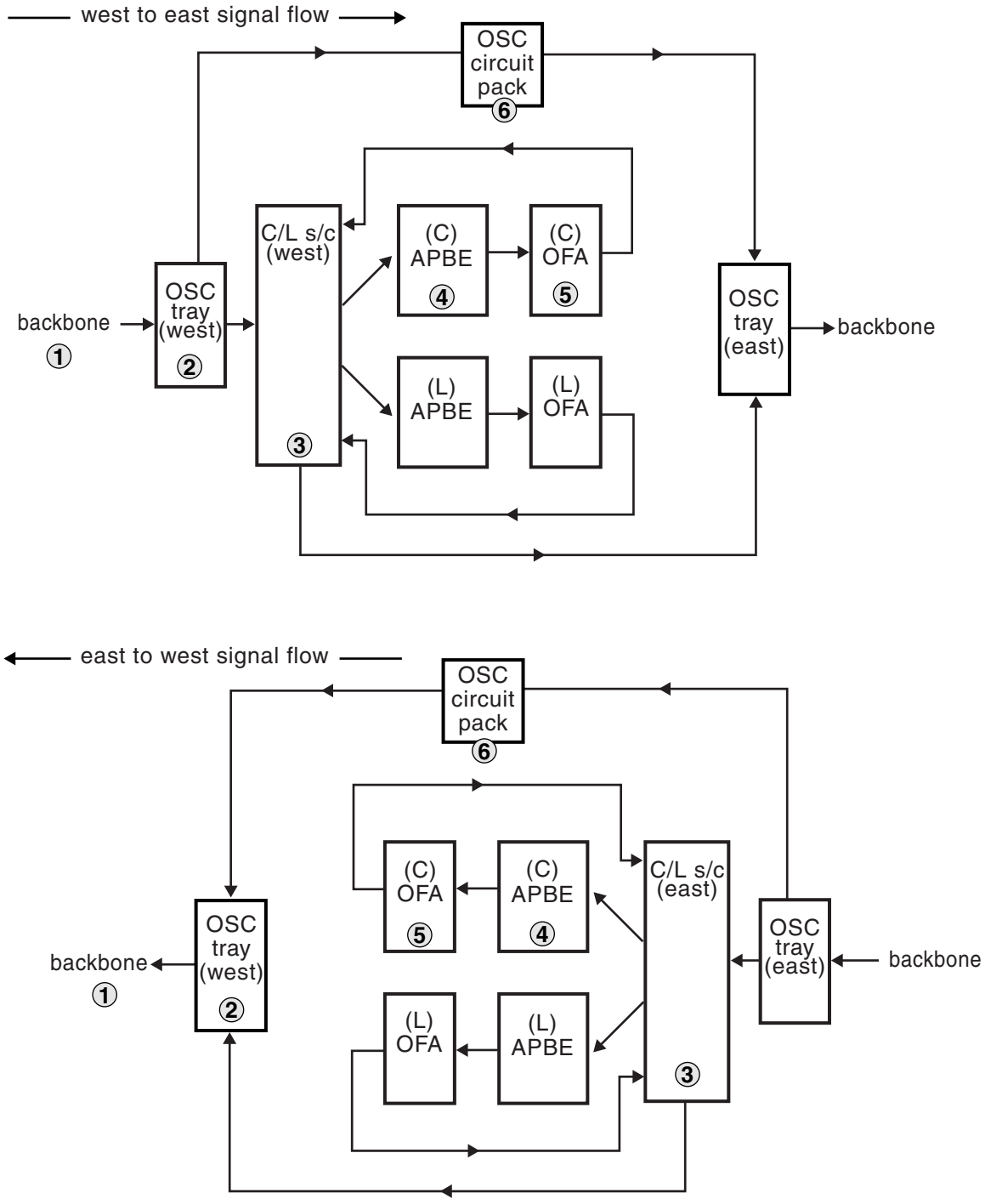


Table 2-47
Optical connections for a DWDM line-amp site using APBEs with straddled C&L splitter/couplers

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	3	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the APBE to other optical components	4	Procedure 3-9 Connecting APBEs on page 3-64
Connect the amplifiers to other optical components	5	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OSC circuit pack	6	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Figure 2-46
DWDM line-amp site using discrete VOAs with straddled C&L splitter/couplers

OM2302p

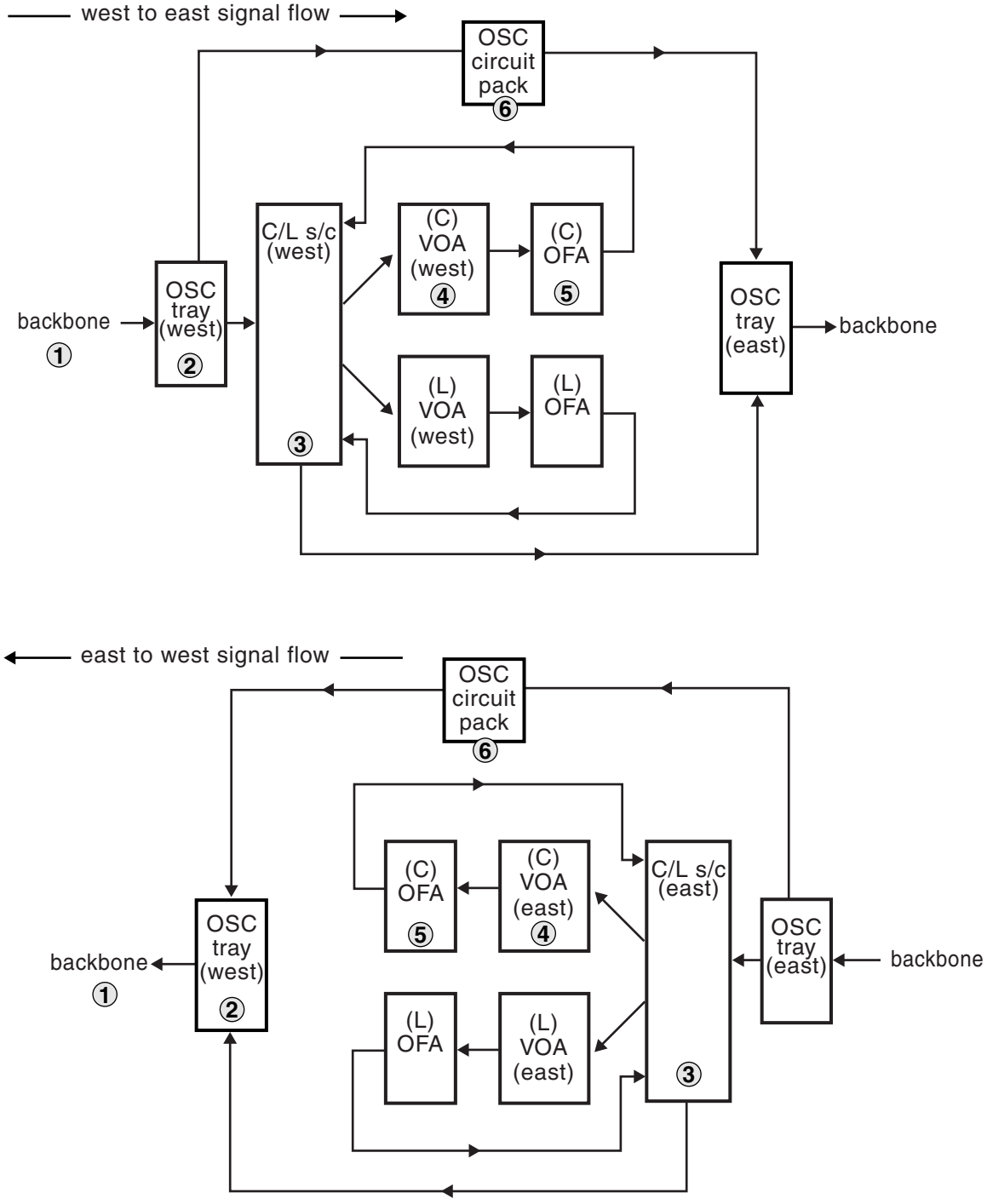


Table 2-48
Optical connections for a DWDM line-amp site using discrete VOAs with straddled C&L splitter/couplers

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site (see Note 1)	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	3	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the discrete VOAs to other optical components (see Note 2)	4	Procedure 3-10 Connecting Discrete VOAs
Connect the amplifiers to other optical components	5	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OSC circuit pack	6	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Note 1: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.

Note 2: The OFA VGA has an integrated eVOA (electrically controlled variable optical attenuator). For this reason, a VOA is not required when an OFA VGA is used. An equalizer (PBE, APBE) may still be required.

Figure 2-47
DWDM line-amp site using distributed equalization with straddled C&L splitter/couplers

OM1812

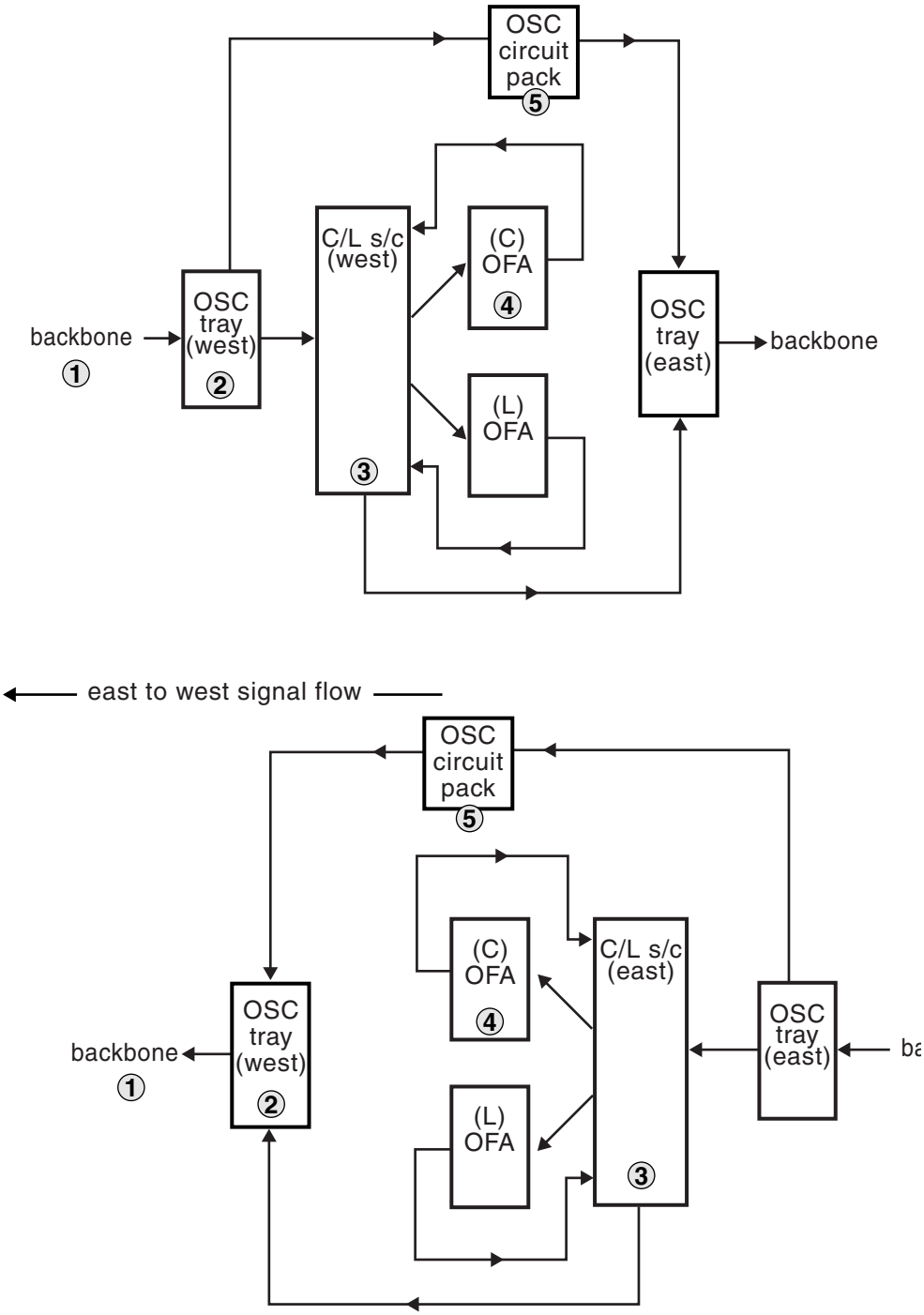


Table 2-49
Optical connections for a DWDM line-amp site using distributed equalization with straddled C&L splitter/couplers

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	3	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the amplifiers to other optical components	4	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OSC circuit pack	5	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Special cases

There are several configurations that do not fit into the categories of standard or serial. Table 2-50 lists the diagrams for special case scenarios.

Table 2-50
Special case scenarios

Example	Page	Notes
Unamplified ITU CWDM site with 1310 nm splitter/couplers	2-103	Not supported in Network Modeling Tool.
Unamplified DWDM, CWDM, or ITU CWDM terminal sites in a point-to-point network with trunk switches	2-105	Use in conjunction with other site type diagrams to depict a complete site with trunk switches.
Site without multiplexing	2-106	Use the site layout “OCLD/OTR Array” in Network Modeling Tool.
DWDM pre-amp site with parallel WDM shelves using straddled ECTs	2-107	Use the site layout “parallel” in Network Modeling Tool.
Generic OADM and Terminal with PBE site diagram for Extended Metro DWDM Solution	2-109	Not supported in Network Modeling Tool.
Generic OADM and Terminal with APBE site diagram for Extended Metro DWDM Solution	2-112	Not supported in Network Modeling Tool.
Generic Line Amplifier with PBE site diagram for Extended Metro DWDM Solution	2-115	Not supported in Network Modeling Tool.
Generic Line Amplifier with APBE site diagram for Extended Metro DWDM Solution	2-117	Not supported in Network Modeling Tool.
Generic dual OFA pre-amplified site for Extended Metro DWDM Solution	2-119	Not supported in Network Modeling Tool.

Figure 2-48
Unamplified ITU CWDM site with 1310 nm splitter/couplers

OM2077p

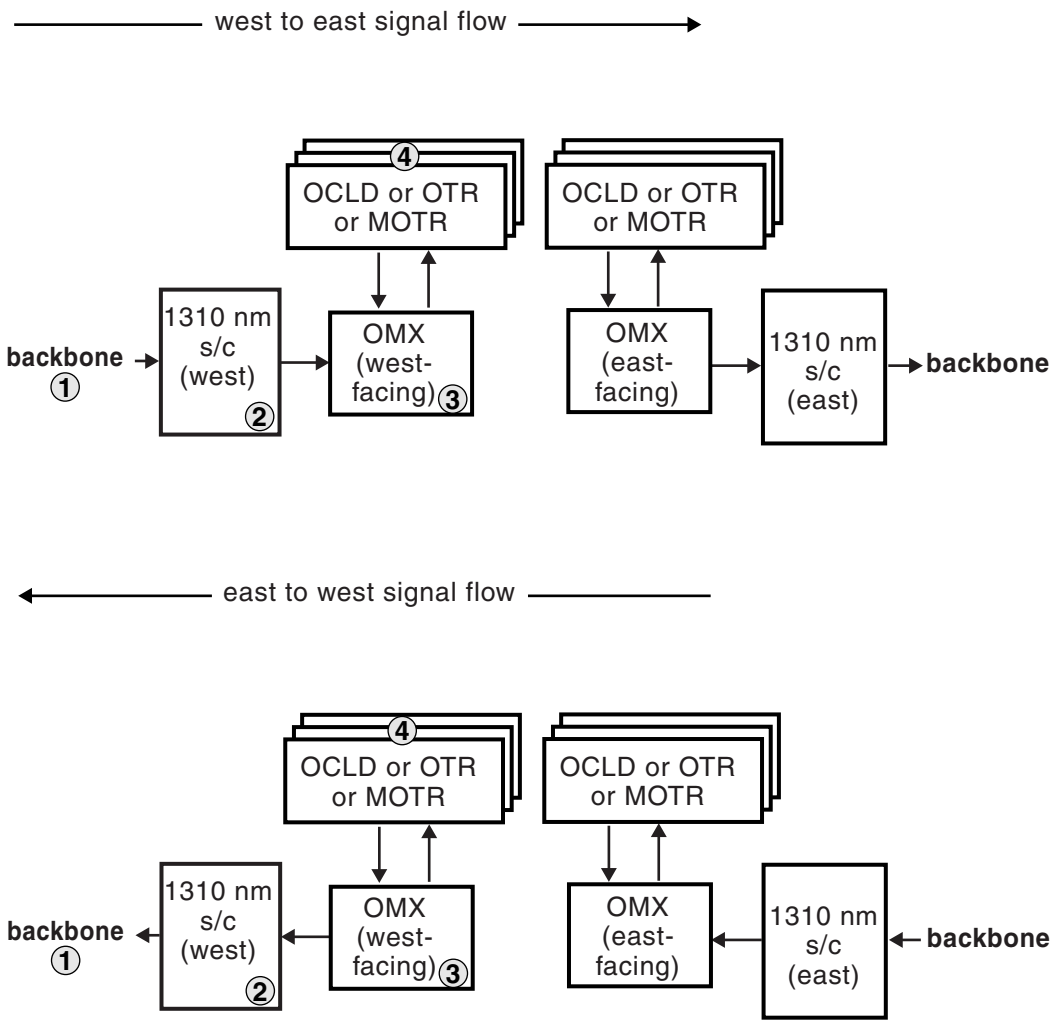
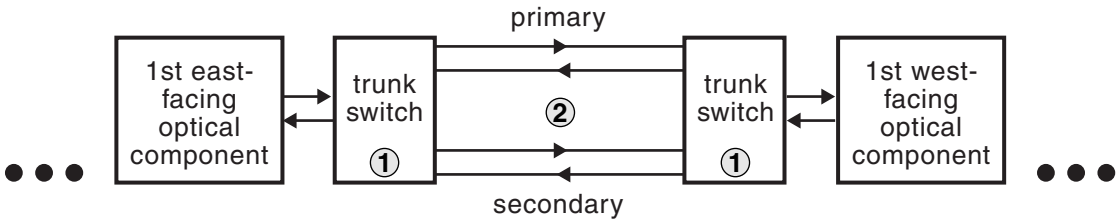


Table 2-51
Optical connections for an unamplified ITU CWDM site with 1310 nm splitter/couplers

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect 1310 nm splitter/couplers to other optical components	2	Procedure 3-6 Connecting 1310 nm splitter/couplers on page 3-48
Connect the OMX to other optical components	3	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	4	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158

Figure 2-49
Unamplified DWDM, CWDM, or ITU CWDM terminal sites in a point-to-point network with trunk switches

OM2424p



Note 1: Figure 2-49 shows an example of a point-to-point network using trunk switches for signal protection. A trunk switch can be either an Optical Trunk Switch (OTS) (NT0H43CA) or an Enhanced Trunk Switch (ETS) (NT0H90GA). At each terminal site in the network, the trunk switch must be connected directly to the backbone. Use this diagram in conjunction with the other applicable site diagram that describes the terminal sites in your point-to-point network.

Note 2: For simplicity, Figure 2-49 does not include a patch panel (NT0H43CA or NT0H43CB). If the trunk switch network includes the 10 Gbit/s OTR Enhanced circuit packs or the Muxponder circuit packs, patch panels can be required to support the addition of optical attenuator pads if the link loss between the primary and standby paths is greater than 2 dB.

Note 3: OTS links do not support amplification. On the other hand, ETS links support pre-amplification.

Table 2-52
Connections for DWDM, CWDM, and ITU CWDM terminal sites in a point-to-point network with trunk switches

Task	Label on figure	Procedure
Connect the trunk switch to other optical components	1	Procedure 3-18 Connecting trunk switches to optical components on page 3-109
Interconnect the trunk switch through the backbone	2	Procedure 3-37 Interconnecting Optical Trunk Switches through the backbone on page 3-273 or Procedure 3-38 Interconnecting Enhanced Trunk Switches through the backbone on page 3-279

Figure 2-50
Site without multiplexing

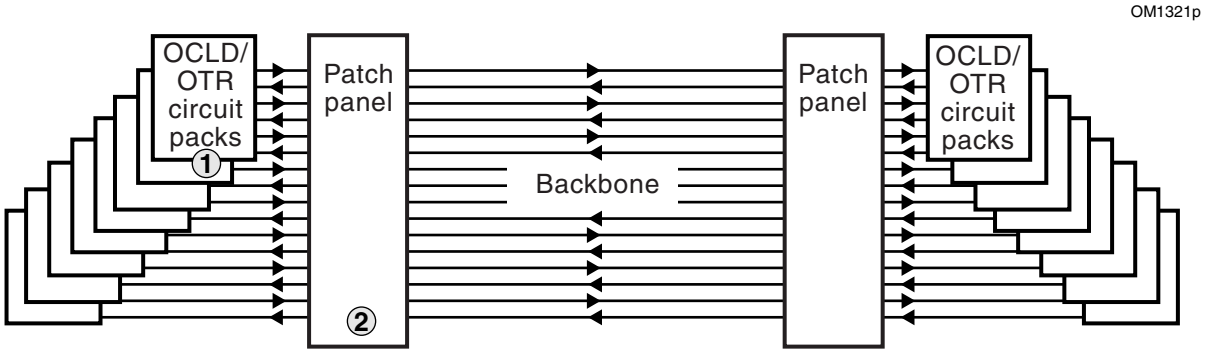
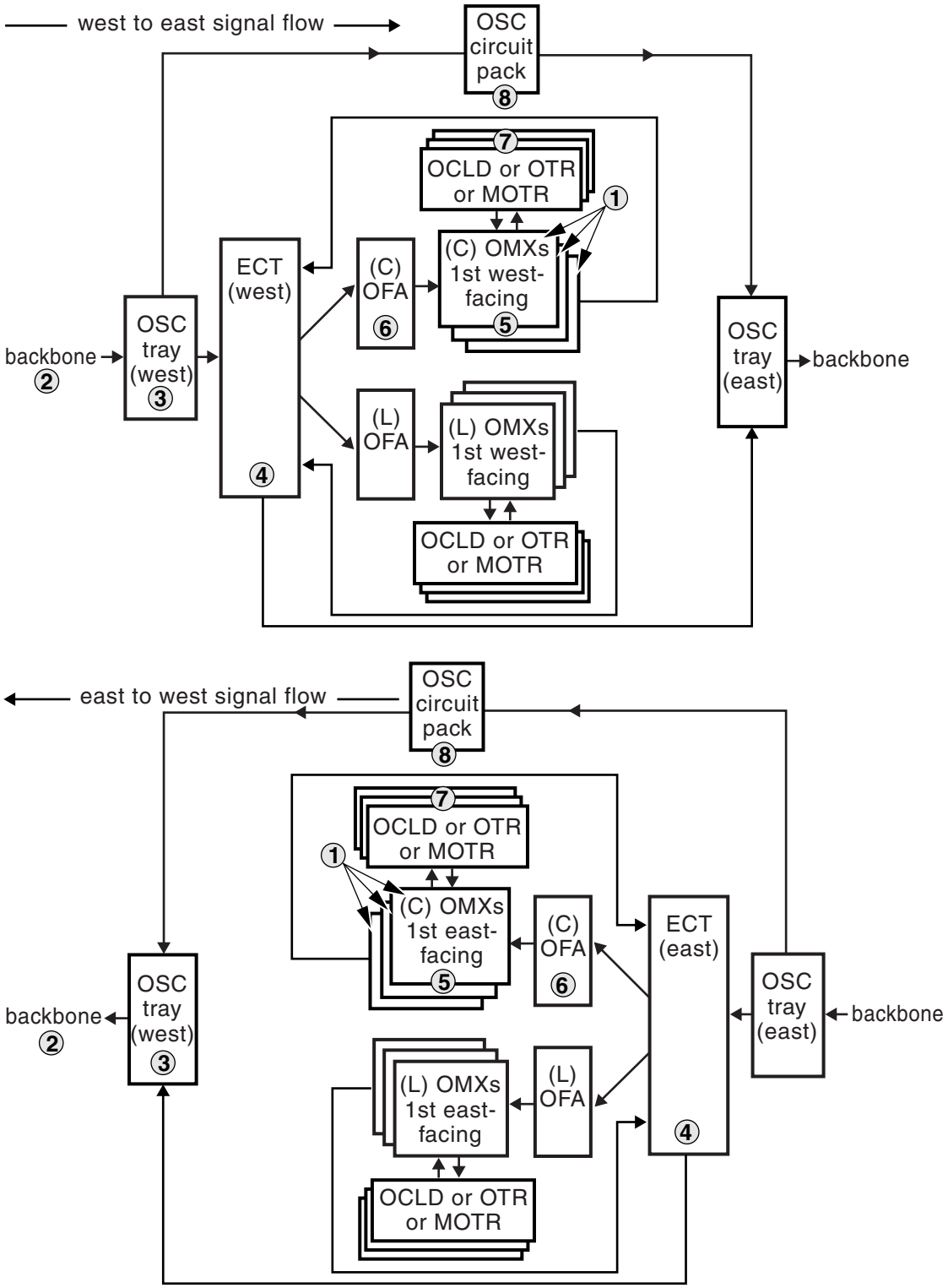


Table 2-53
Optical connections for an unamplified site without multiplexing

Task	Label on figure	Procedure
When attenuation is not required, connect the OCLDs or OTRs directly to the backbone	1	Procedure 3-40 Connecting OCLDs or OTRs to the backbone at sites without OMXs on page 3-290
When attenuation is required, connect the OCLDs or OTRs to the patch panel through an attenuator		Procedure 3-41 Connecting OCLDs or OTRs to the patch panel at sites without OMXs on page 3-294
Connect the patch panel to the backbone	2	Procedure 3-42 Connecting the patch panel to the backbone at a site without OMXs on page 3-300

Figure 2-51
DWDM pre-amp site with parallel WDM shelves using straddled ECTs

OM1370p



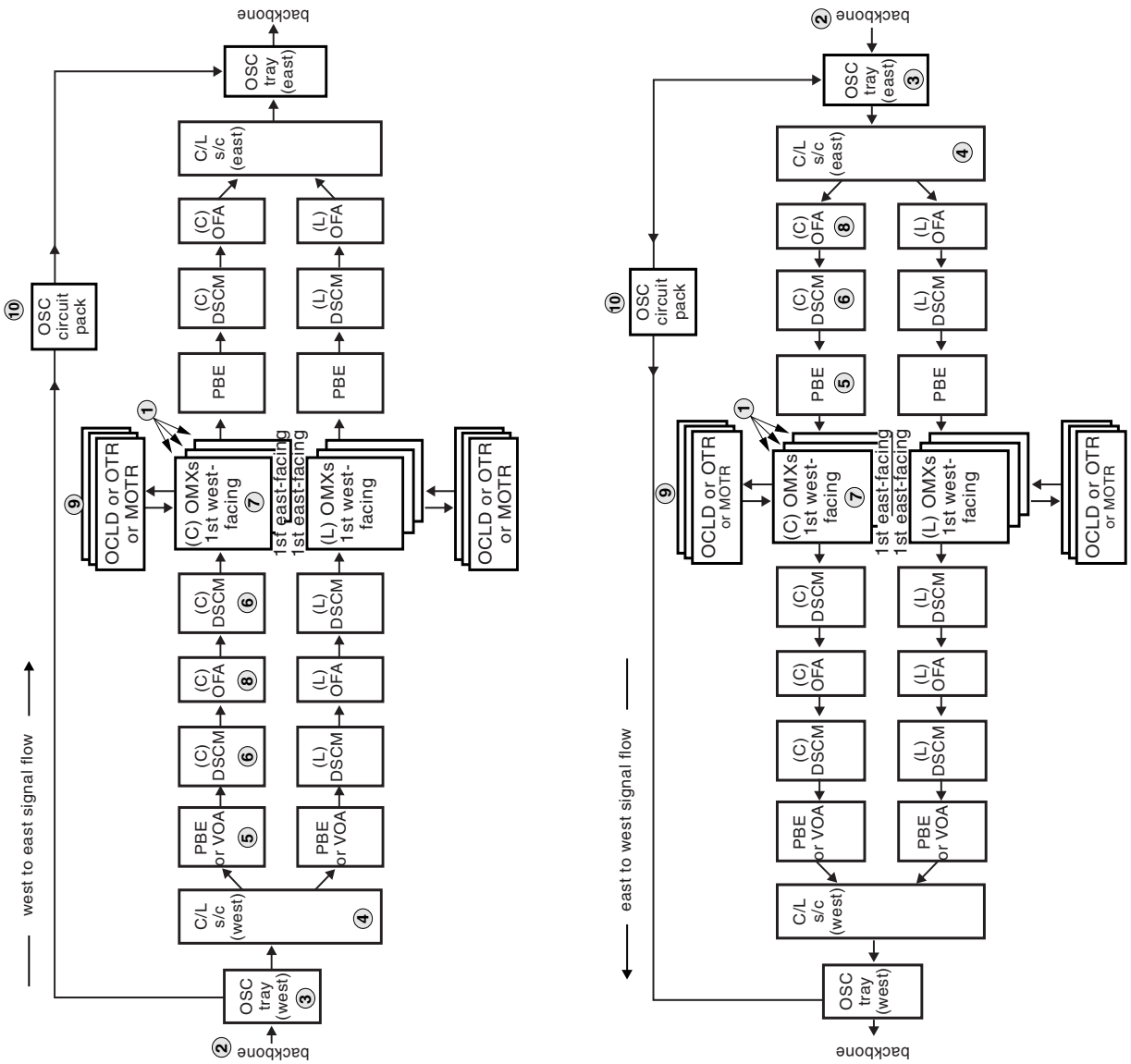
Although previous releases of the Optical Metro 5100/5200 supported this site type, this violates the recommendation that ECTs should not straddle WDM shelves. In the event of a failure of the ECT, both directions of traffic may be affected, resulting in a loss of traffic—even for protected connections. It is recommended that you use the standard (bookended) configuration for this site type instead.

Table 2-54
Optical connections for a DWDM pre-amp site with parallel WDM shelves using straddled ECTs

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect ECT to other optical components	4	Procedure 3-7 Connecting ECTs on page 3-52
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the amplifiers to other optical components	6	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	7	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	8	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-52
Generic OADM and Terminal with PBE site diagram for Extended Metro DWDM Solution

OM2440, OM2441



Generic OADM and Terminal with PBE site diagram for Extended Metro DWDM Solution is for illustration purpose only. Only certain combinations of components are supported. The placement of components in this site topology are provided by the custom link engineering report.

> ***Note:*** C-band or L-band only systems use the same site topologies without the C/L coupler. The OSC tray and circuit pack is optional but recommended.

Table 2-55
Optical connections for a Generic OADM and Terminal with PBE site diagram for Extended Metro DWDM Solution

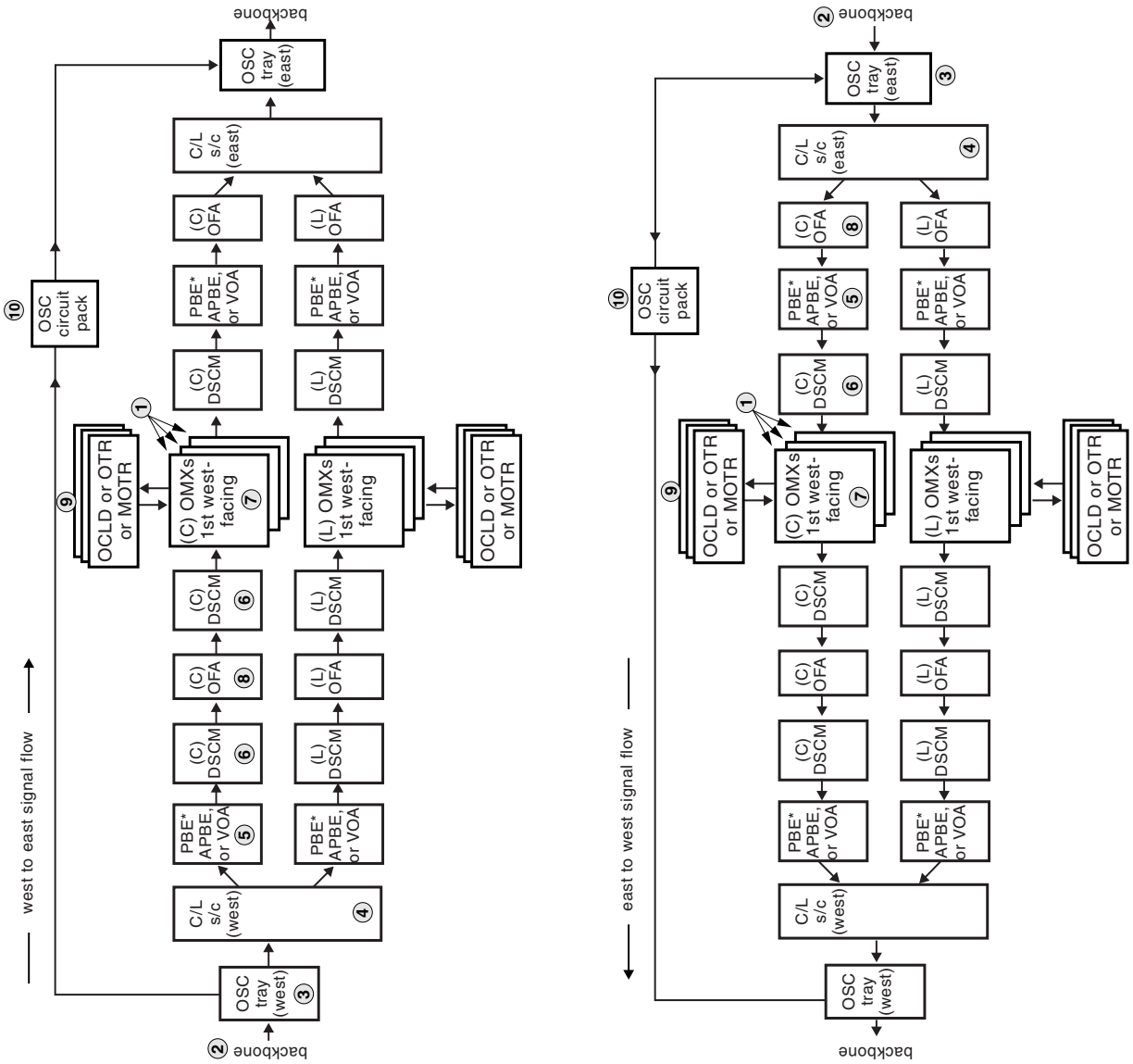
Task	Label on figure	Procedure
Connect OMX modules (see Note 1)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	4	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the PBE to other optical components or	5	Procedure 3-8 Connecting PBEs on page 3-60
Connect the discrete VOA to other optical components (see Note 2)	5	Procedure 3-10 Connecting Discrete VOAs
Connect a DSCM Tray to other optical components	6	Procedure 3-43 Connecting DSCM Trays to optical components
Connect the OMX to other optical components	7	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the amplifiers to other optical components	8	Procedure 3-11 Connecting OFA circuit packs on page 3-72

Table 2-55 (continued)
Optical connections for a Generic OADM and Terminal with PBE site diagram for Extended Metro DWDM Solution

Task	Label on figure	Procedure
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	9	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	10	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note 1: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow. ***Note 2:*** The OFA VGA has an integrated eVOA (electrically controlled variable optical attenuator). For this reason, a VOA is not required when an OFA VGA is used. An equalizer (PBE, APBE) may still be required.		

Figure 2-53
Generic OADM and Terminal with APBE site diagram for Extended Metro DWDM Solution

OM2426p, om2427p



Generic OADM and Terminal with APBE site diagram for Extended Metro DWDM Solution is for illustration purpose only. Only certain combinations of components are supported. The placement of components in this site topology are provided by the custom link engineering report.

> ***Note:*** C-band or L-band only systems use the same site topologies without the C/L coupler. The OSC tray and circuit pack is optional but recommended.

Table 2-56
Optical connections for a Generic OADM and Terminal with APBE site diagram for Extended Metro DWDM Solution

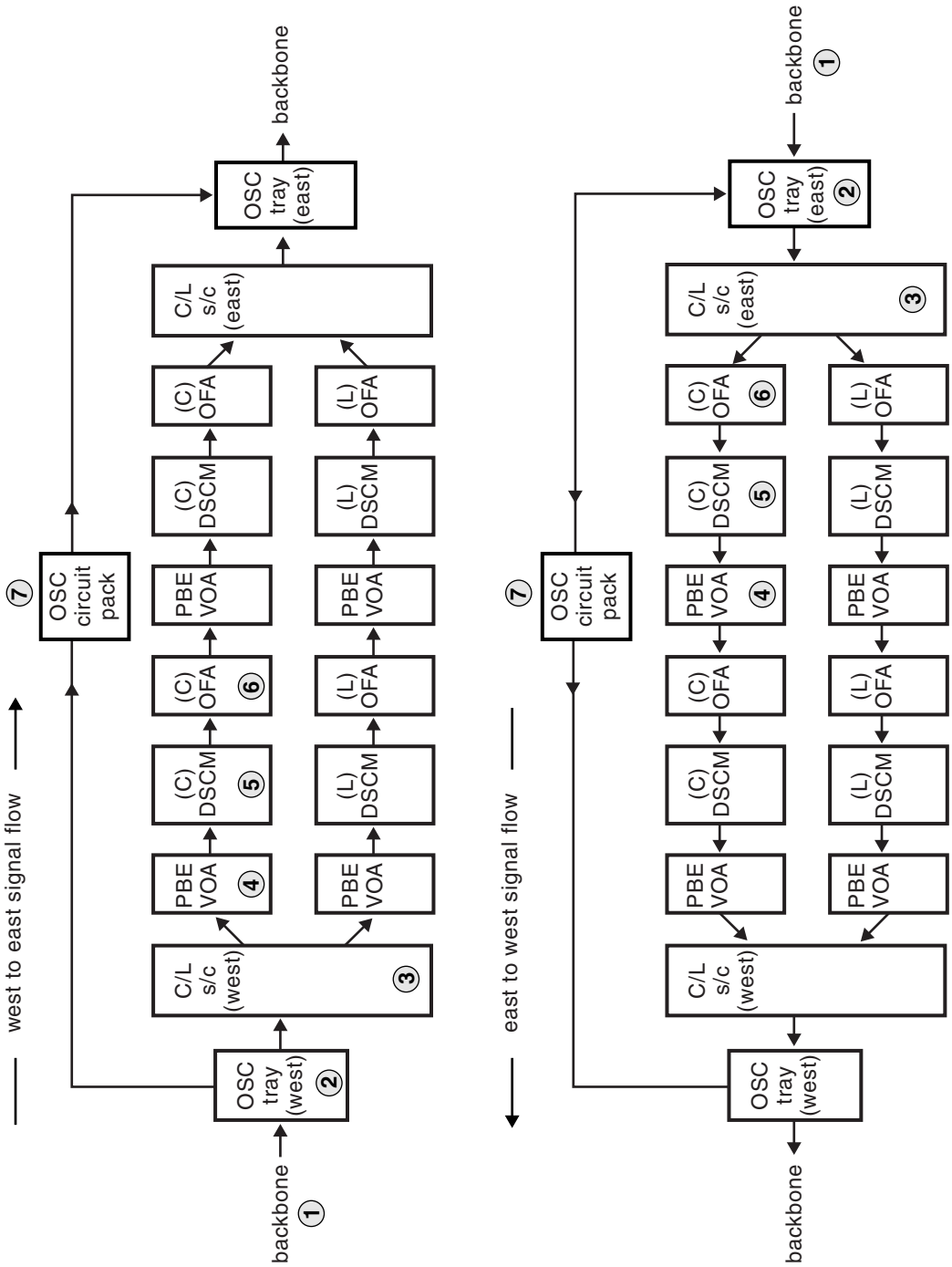
Task	Label on figure	Procedure
Connect OMX modules (see Note 1)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	4	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the PBE to other optical components or	5	Procedure 3-8 Connecting PBEs on page 3-60
Connect the discrete VOA to other optical components (see Note 2) or	5	Procedure 3-10 Connecting Discrete VOAs
Connect the APBE to other optical components	5	Procedure 3-9 Connecting APBEs on page 3-64
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect a DSCM Tray to other optical components	6	Procedure 3-43 Connecting DSCM Trays to optical components
Connect the OMX to other optical components	7	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the amplifiers to other optical components	8	Procedure 3-11 Connecting OFA circuit packs on page 3-72

Table 2-56 (continued)
Optical connections for a Generic OADM and Terminal with APBE site diagram for Extended Metro DWDM Solution

Task	Label on figure	Procedure
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	9	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	10	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note 1: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow. ***Note 2:*** The OFA VGA has an integrated eVOA (electrically controlled variable optical attenuator). For this reason, a VOA is not required when an OFA VGA is used. An equalizer (PBE, APBE) may still be required.		

Figure 2-54
Generic Line Amplifier with PBE site diagram for Extended Metro DWDM Solution

OM2439p



Generic Line Amplifier with PBE site diagram for Extended Metro DWDM Solution is for illustration purpose only. Only certain combinations of components are supported. The placement of components in this site topology are provided by the custom link engineering report.

Note 1: The dual line amplifier site configuration is not supported in release 6.1 or 7.0 extended metro solutions from a link engineering perspective. An extended metro dual line-amp site configurations has 2 or more OFAs at the same location which are provisioned in the same direction (eastbound, westbound or pass-through).

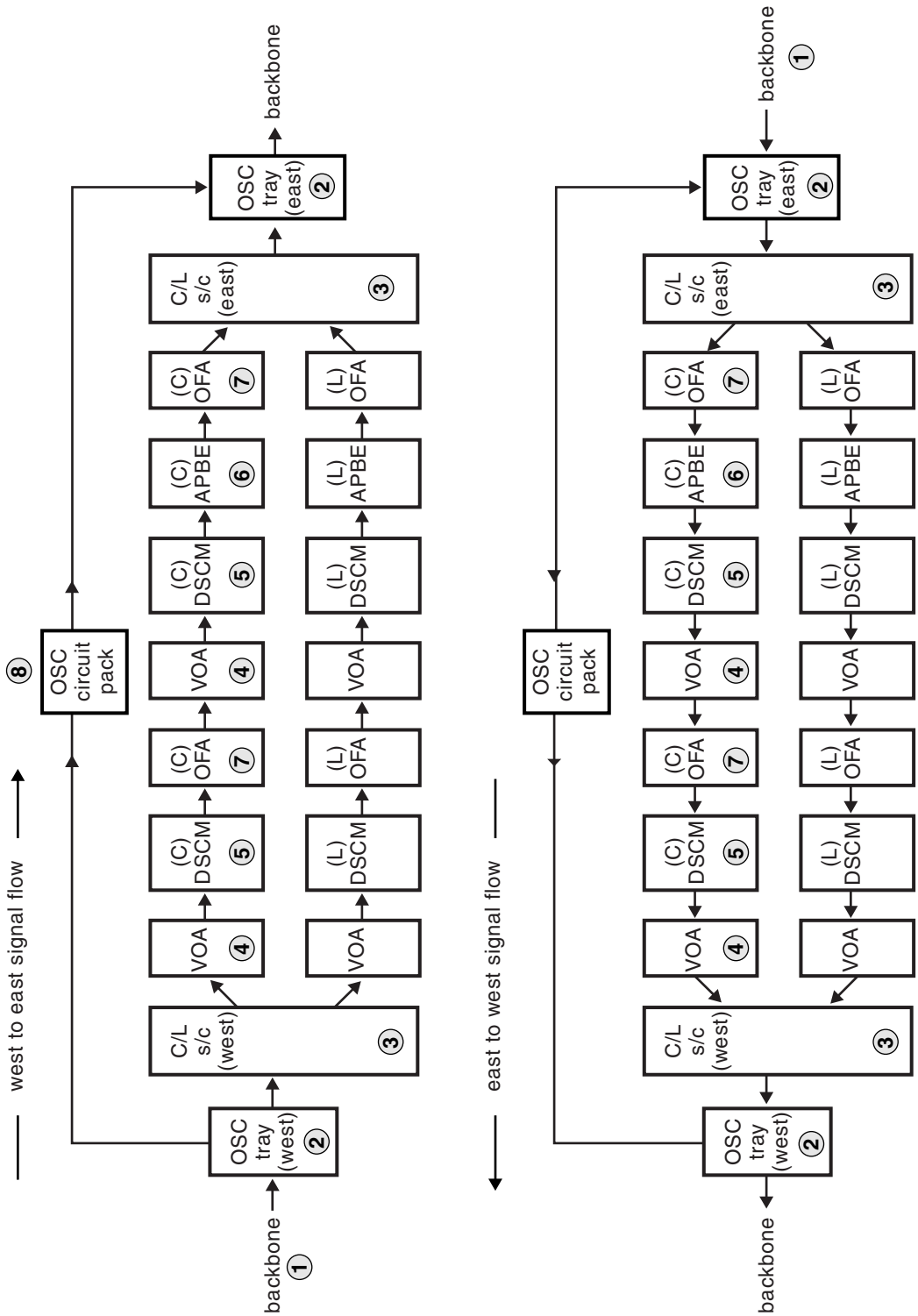
Note 2: C-band or L-band only systems use the same site topologies without the C/L coupler. The OSC tray and circuit pack is optional but recommended.

Table 2-57
Optical connections for a Generic Line Amplifier with PBE site diagram for Extended Metro DWDM Solution

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	3	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the PBE to other optical components or	4	Procedure 3-8 Connecting PBEs on page 3-60
Connect the discrete VOA to other optical components (see Note) or	4	Procedure 3-10 Connecting Discrete VOAs
Connect a DSCM Tray to other optical components	5	Procedure 3-43 Connecting DSCM Trays to optical components
Connect the amplifiers to other optical components	6	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OSC circuit pack	7	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OFA VGA has an integrated eVOA (electrically controlled variable optical attenuator). For this reason, a VOA is not required when an OFA VGA is used. An equalizer (PBE, APBE) may still be required.		

Figure 2-55
Generic Line Amplifier with APBE site diagram for Extended Metro DWDM Solution

OM2425p



Generic Line Amplifier with APBE site diagram for Extended Metro DWDM Solution is for illustration purpose only. Only certain combinations of components are supported. The placement of components in this site topology are provided by the custom link engineering report.

Note 1: The dual line amplifier site configuration is not supported in release 6.1 or 7.0 extended metro solutions from a link engineering perspective. An extended metro dual line-amp site configurations has 2 or more OFAs at the same location which are provisioned in the same direction (eastbound, westbound or pass-through).

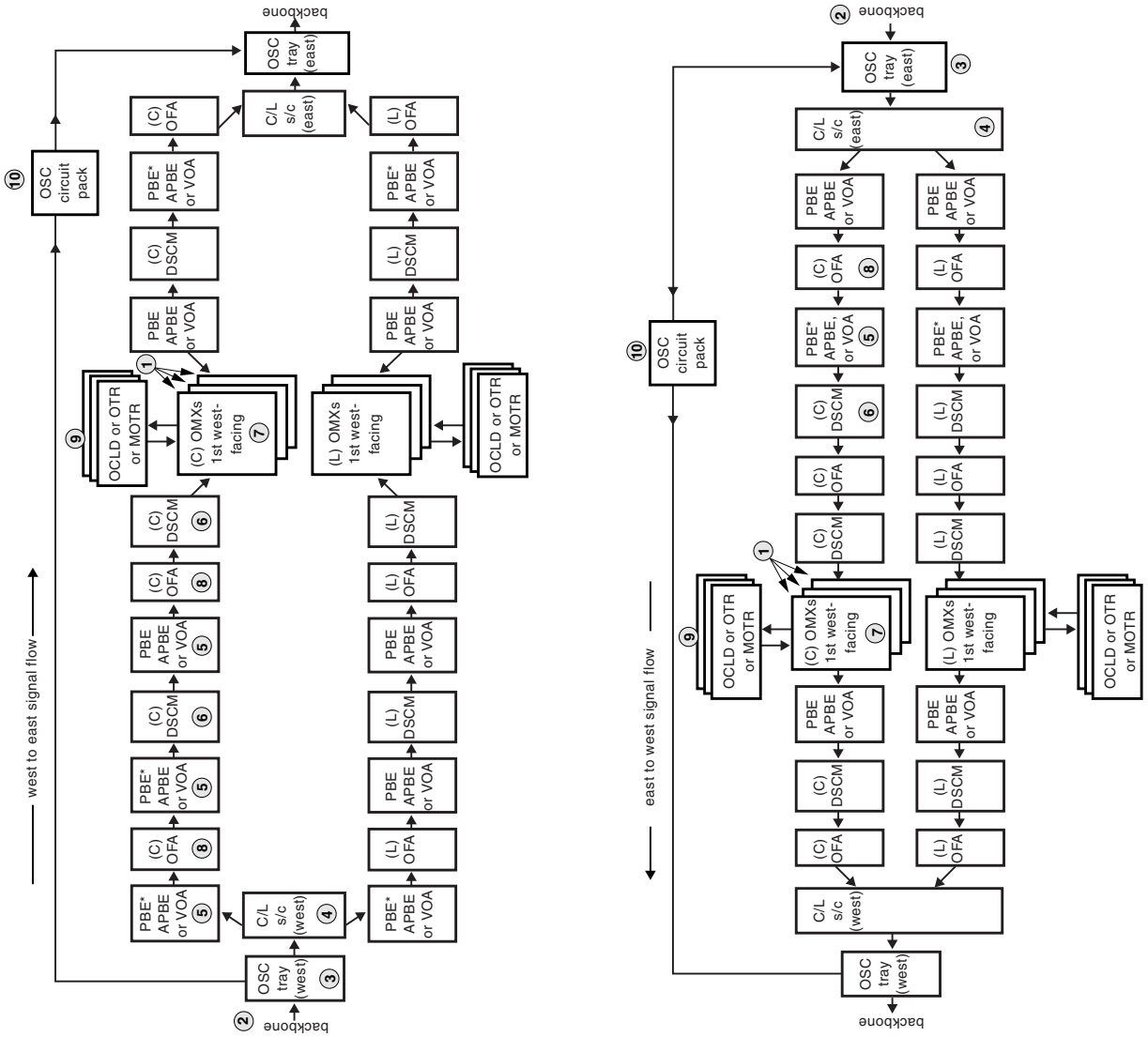
Note 2: C-band or L-band only systems use the same site topologies without the C/L coupler. The OSC tray and circuit pack is optional but recommended.

Table 2-58
Optical connections for a Generic Line Amplifier with APBE site diagram for Extended Metro DWDM Solution

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	3	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the discrete VOA to other optical components (see Note) or	4	Procedure 3-10 Connecting Discrete VOAs
Connect a DSCM Tray to other optical components	5	Procedure 3-43 Connecting DSCM Trays to optical components
Connect the APBE to other optical components	6	Procedure 3-9 Connecting APBEs on page 3-64
Connect the amplifiers to other optical components	7	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OSC circuit pack	8	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OFA VGA has an integrated eVOA (electrically controlled variable optical attenuator). For this reason, a VOA is not required when an OFA VGA is used. An equalizer (PBE, APBE) may still be required.		

Figure 2-56
Generic dual OFA pre-amplified site for Extended Metro DWDM Solution

om2814/2815



Note: C-band or L-band only systems use the same site topologies without the C/L coupler. The OSC tray and circuit pack is optional but recommended.

Table 2-59
Optical connections for a generic dual OFA pre-amplified site for Extended Metro DWDM Solution

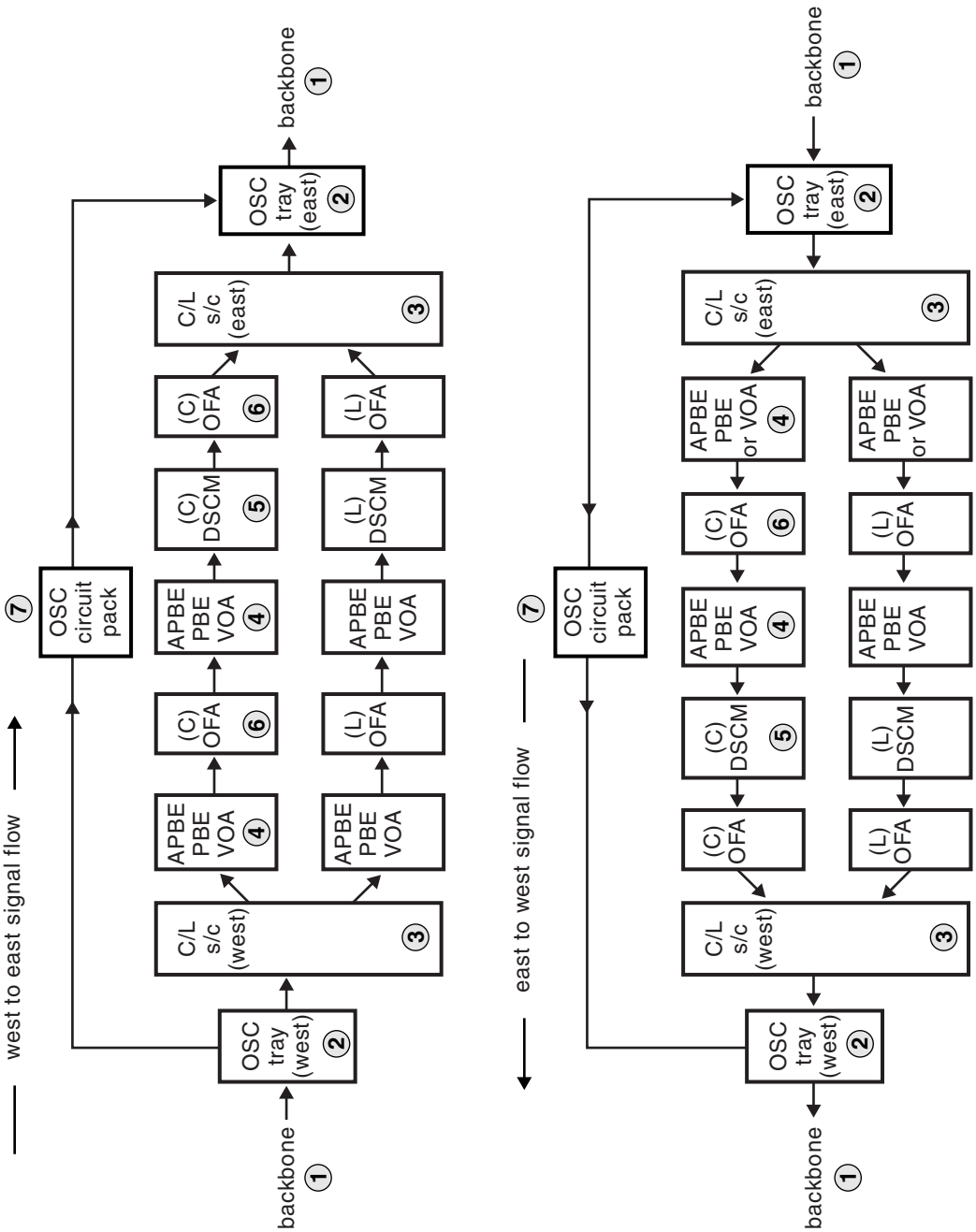
Task	Label on figure	Procedure
Connect OMX modules (see Note 1)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	4	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the PBE to other optical components or	5	Procedure 3-8 Connecting PBEs on page 3-60
Connect the discrete VOA to other optical components (see Note 2) or	5	Procedure 3-10 Connecting Discrete VOAs
Connect the APBE to other optical components	5	Procedure 3-9 Connecting APBEs on page 3-64
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect a DSCM Tray to other optical components	6	Procedure 3-43 Connecting DSCM Trays to optical components
Connect the OMX to other optical components	7	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the amplifiers to other optical components	8	Procedure 3-11 Connecting OFA circuit packs on page 3-72

Table 2-59 (continued)
Optical connections for a generic dual OFA pre-amplified site for Extended Metro DWDM Solution

Task	Label on figure	Procedure
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	9	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	10	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note 1: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow. ***Note 2:*** The OFA VGA has an integrated eVOA (electrically controlled variable optical attenuator). For this reason, a VOA is not required when an OFA VGA is used. An equalizer (PBE, APBE) may still be required.		

Figure 2-57
Generic dual OFA thru-amplified site for Extended Metro DWDM Solution

om2813



Note: C-band or L-band only systems use the same site topologies without the C/L coupler. The OSC tray and circuit pack is optional but recommended.

Table 2-60
Optical connections for a generic dual OFA thru-amplified site for Extended Metro DWDM Solution

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L splitter/couplers to other optical components	3	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the discrete VOA to other optical components (see Note) or	4	Procedure 3-10 Connecting Discrete VOAs
Connect the PBE to other optical components or	4	Procedure 3-8 Connecting PBEs on page 3-60
Connect the APBE to other optical components	4	Procedure 3-9 Connecting APBEs on page 3-64
Connect a DSCM Tray to other optical components	5	Procedure 3-43 Connecting DSCM Trays to optical components
Connect the amplifiers to other optical components	6	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OSC circuit pack	7	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OFA VGA has an integrated eVOA (electrically controlled variable optical attenuator). For this reason, a VOA is not required when an OFA VGA is used. An equalizer (PBE, APBE) may still be required.		

Legacy configurations

Table 2-61 lists the diagrams for the legacy site configurations.

Table 2-61
Legacy site configurations

Example	Page
DWDM pre-amp site with serial WDM shelves using straddled ECTs	2-125
DWDM pre-amp site with either C-band or L-band WDM shelves using NT0H31AD ECT	2-127
DWDM pre-amp site with parallel WDM shelves using bookended ECTs	2-129
DWDM post-amp site with serial WDM shelves using straddled ECTs	2-131
DWDM pre-amp and post-amp site with either C-band or L-band WDM shelves using NT0H31AD ECT for pre-amp and APBEs for post-amp	2-132
DWDM pre-amp and post-amp site with either C-band or L-band WDM shelves using NT0H31AD ECT for pre-amp and PBEs for post-amp	2-135
DWDM pre-amp and post-amp site with parallel WDM shelves using NT0H31AD ECTs for pre-amp and APBEs for post-amp	2-137
DWDM pre-amp and post-amp site with parallel WDM shelves using NT0H31AD ECTs for pre-amp and PBEs for post-amp	2-139
DWDM line-amp site using bookended ECTs	2-141
DWDM line-amp site using straddled ECTs	2-143
DWDM line-amp site with either C-band or L-band signals using bookended ECTs	2-145
DWDM line-amp site with either C-band or L-band signals using straddled ECTs	2-147
DWDM line-amp site using APBEs, C&L splitter/couplers and NT0H31AD ECT - Example A	2-149
DWDM line-amp site using APBEs, C&L splitter/couplers and NT0H31AD ECT - Example B	2-150
DWDM line-amp site with either C-band or L-band signals using APBEs and NT0H31AD ECTs	2-153

Figure 2-58
DWDM pre-amp site with serial WDM shelves using straddled ECTs

OM1348p

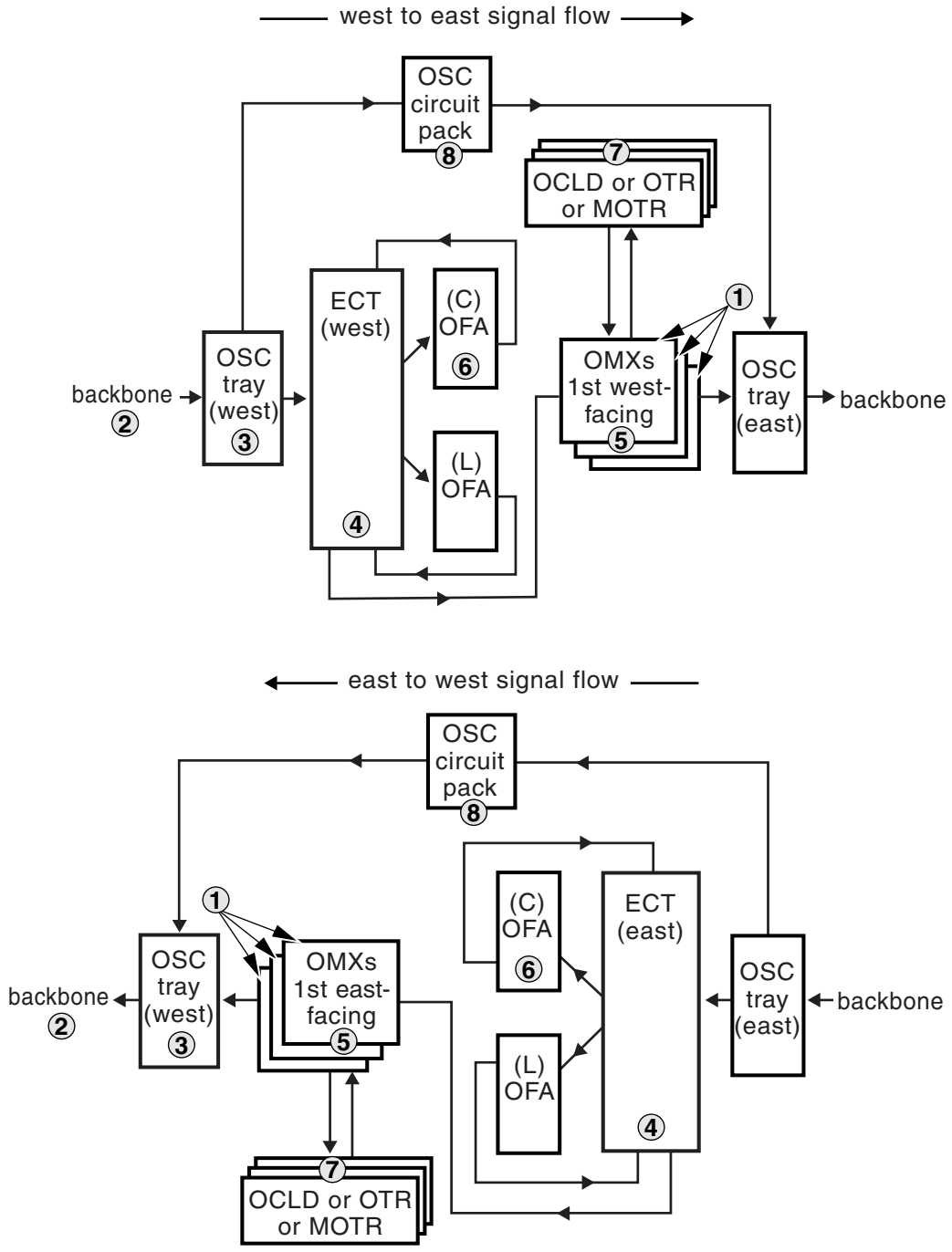


Table 2-62
Optical connections for a DWDM pre-amp site with serial WDM shelves using straddled ECTs

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect ECT to other optical equipment	4	Procedure 3-7 Connecting ECTs on page 3-52
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the amplifiers to other optical components	6	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	7	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	8	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-59
DWDM pre-amp site with either C-band or L-band WDM shelves using NT0H31AD ECT

OM2112p

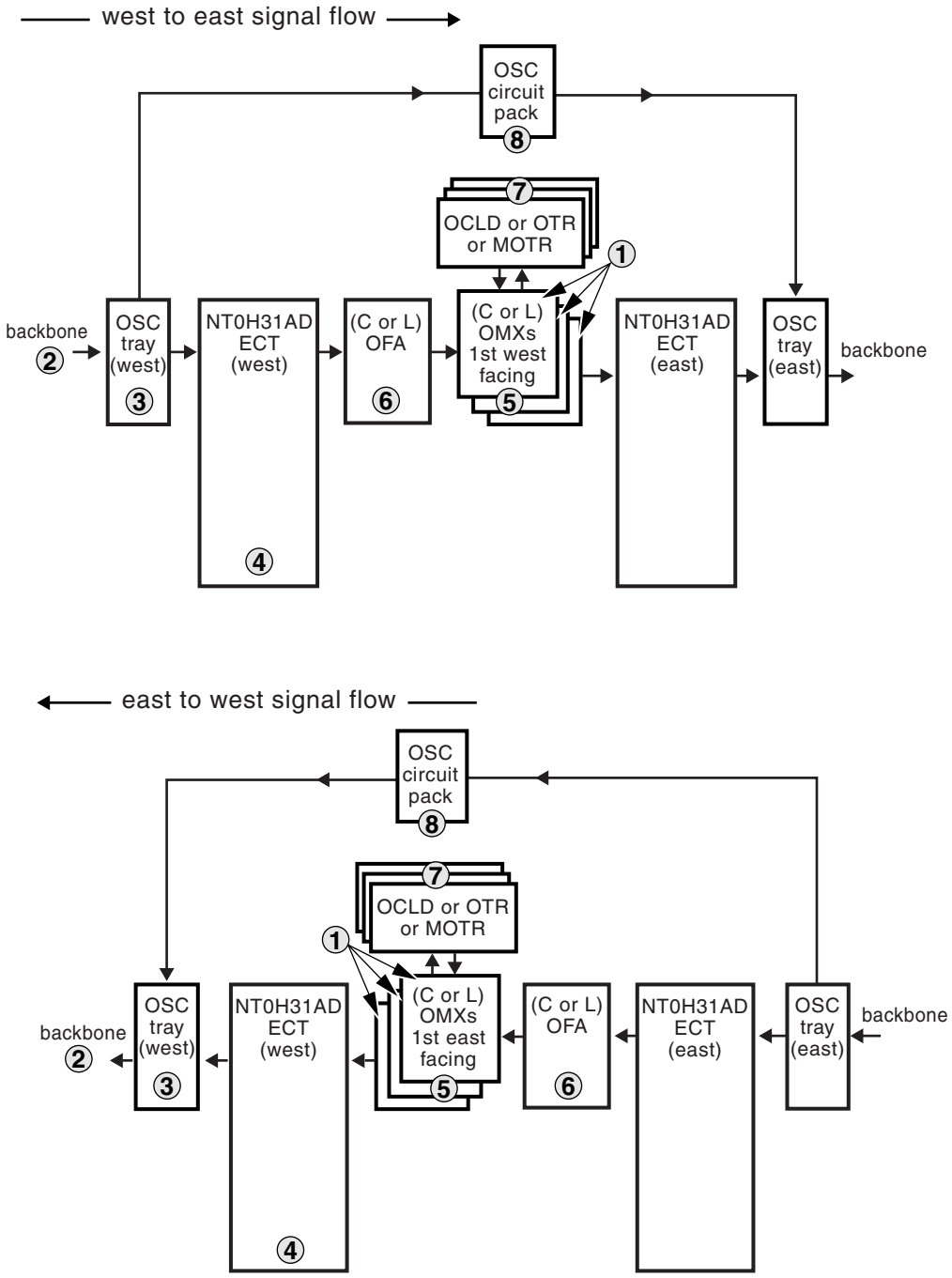


Table 2-63
Optical connections for a DWDM pre-amp site with either C-band or L-band WDM shelves using NT0H31AD ECT

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect ECT to other optical components	4	Procedure 3-7 Connecting ECTs on page 3-52
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the amplifiers to other optical components	6	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	7	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	8	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-60
DWDM pre-amp site with parallel WDM shelves using bookended ECTs

OM1353p

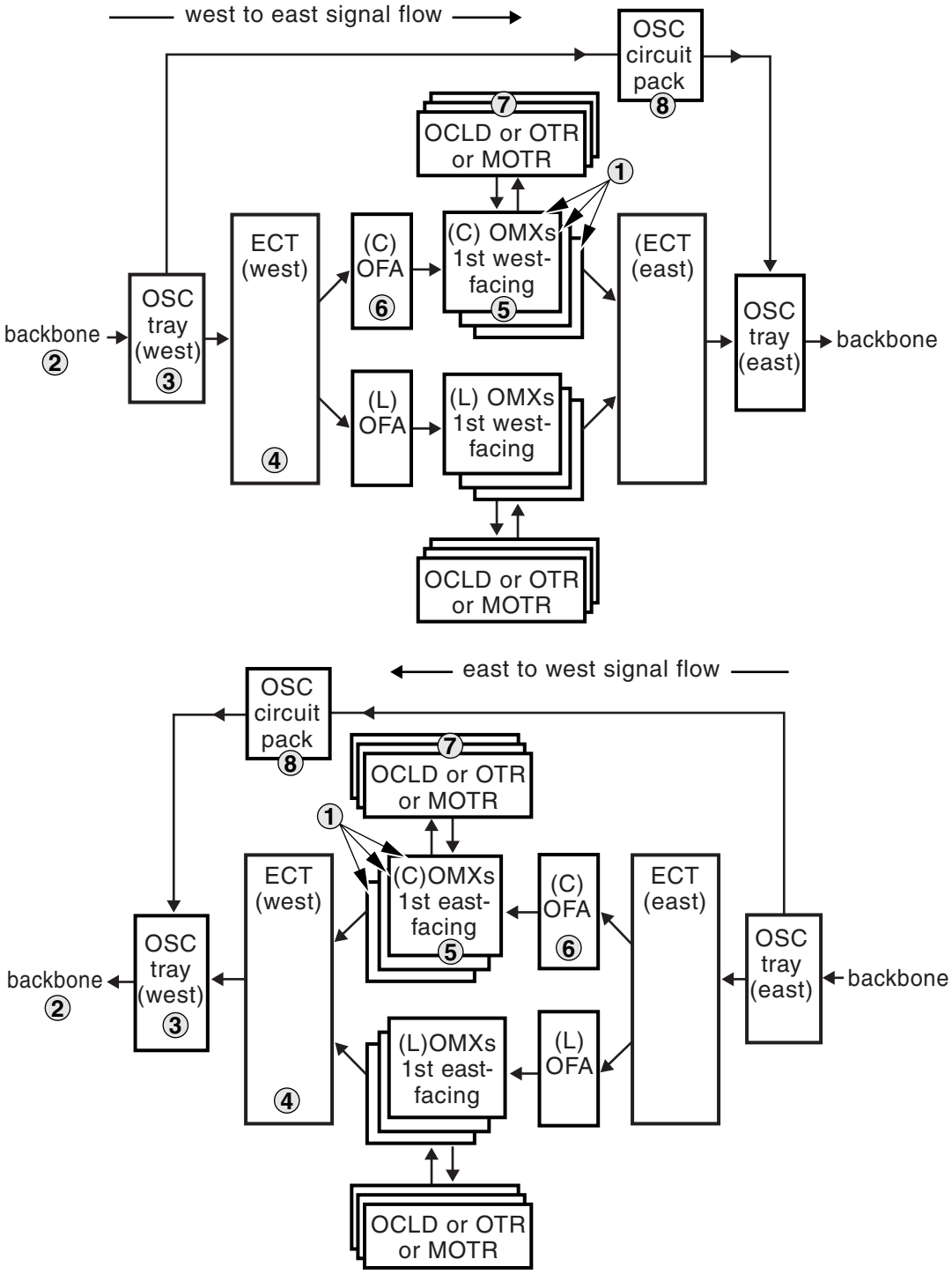


Table 2-64
Optical connections for a DWDM pre-amp site with parallel WDM shelves using bookended ECTs

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect ECT to other optical components	4	Procedure 3-7 Connecting ECTs on page 3-52
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the amplifiers to other optical components	6	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	7	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	8	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-61
DWDM post-amp site with serial WDM shelves using straddled ECTs

OM1338p

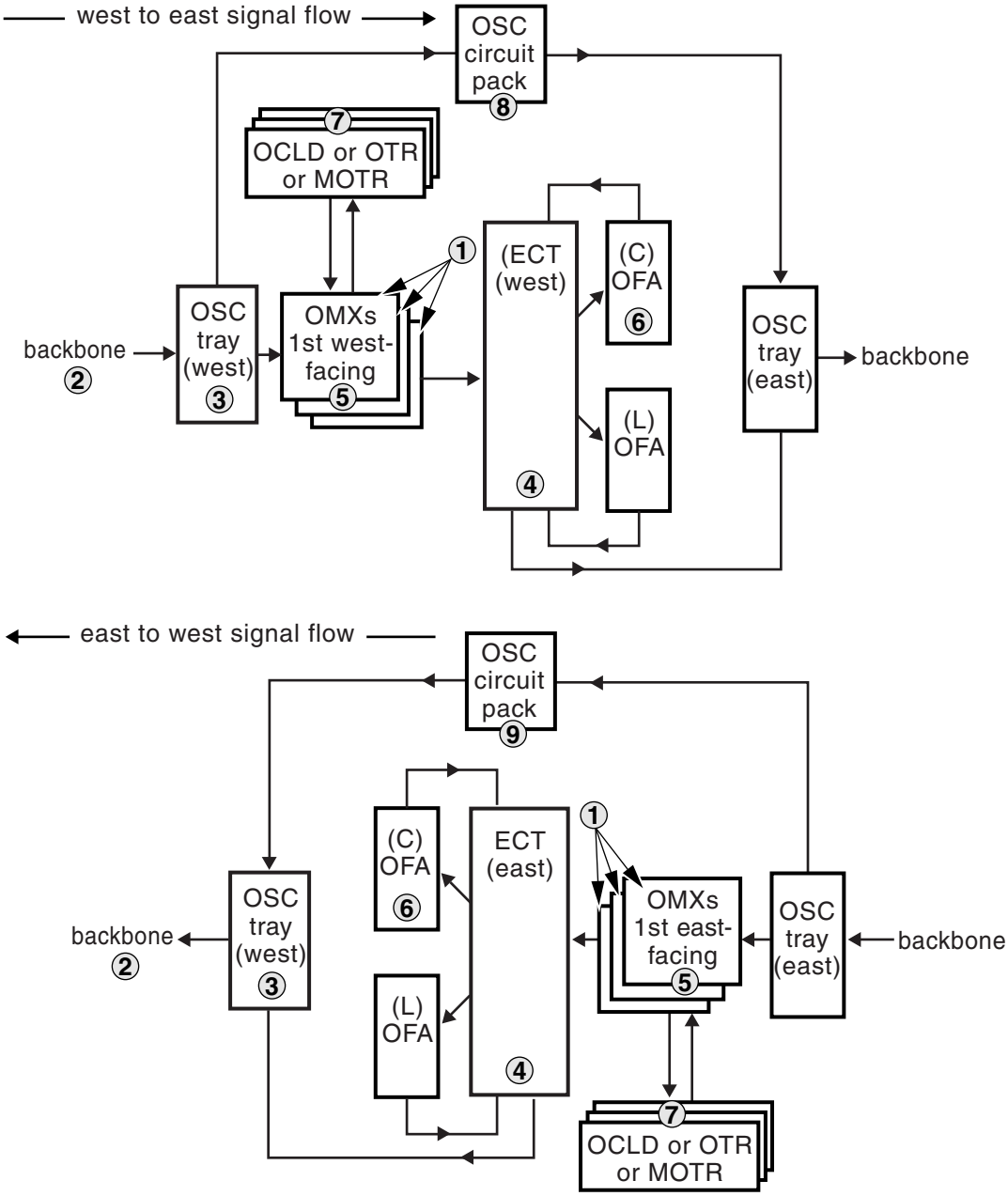


Table 2-65
Optical connections for a DWDM post-amp site with serial WDM shelves using straddled ECTs

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect ECT to other optical components	4	Procedure 3-7 Connecting ECTs on page 3-52
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the amplifiers to other optical components	6	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	7	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	8	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-62
DWDM pre-amp and post-amp site with either C-band or L-band WDM shelves using NT0H31AD ECT for pre-amp and APBEs for post-amp

OM1837p

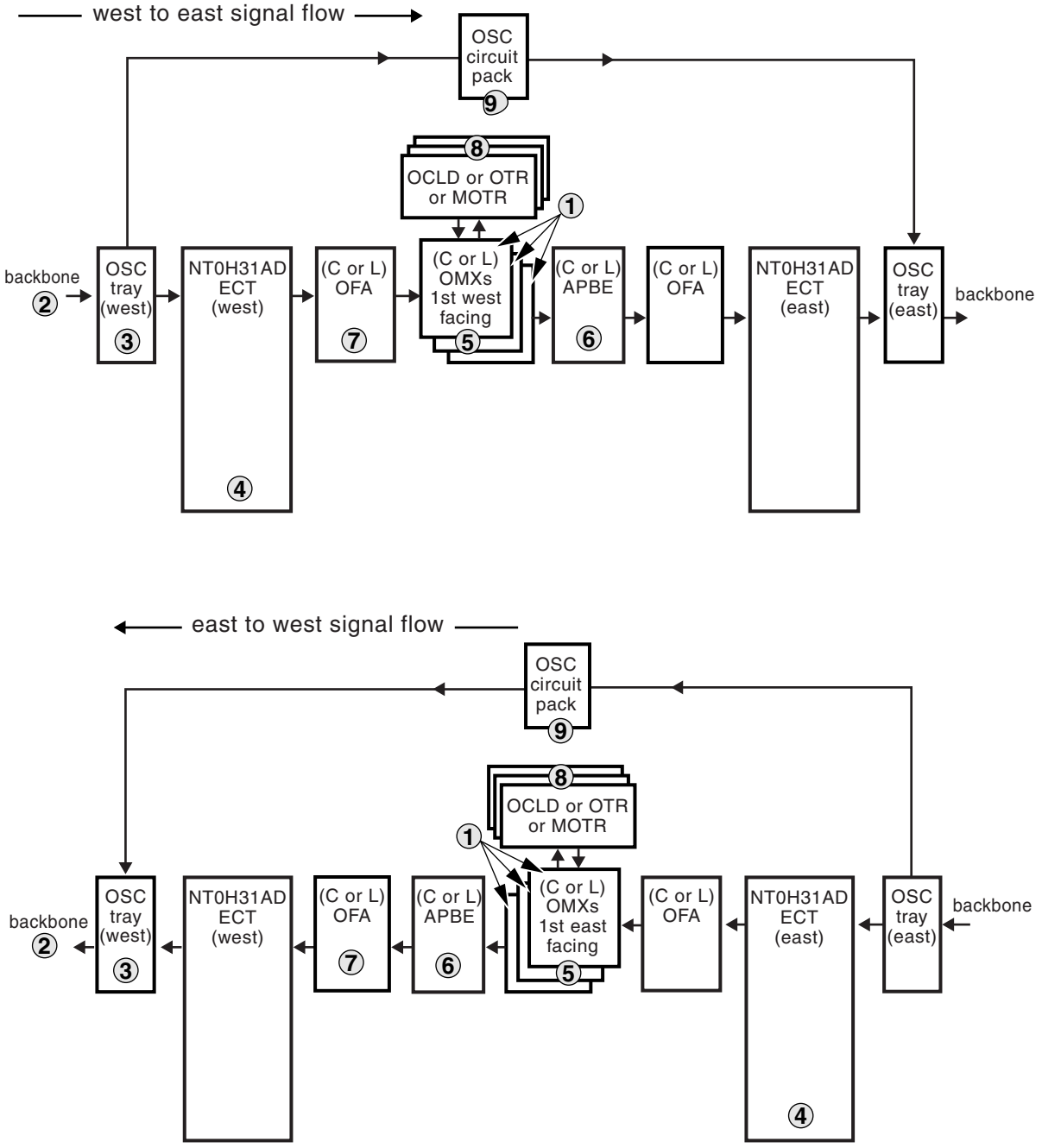


Table 2-66
Optical connections for a DWDM pre-amp and post-amp site with either C-band or L-band WDM shelves using NT0H31AD ECT for pre-amp and APBEs for post-amp

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect ECT to other optical components	4	Procedure 3-7 Connecting ECTs on page 3-52
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the APBE to other optical components	6	Procedure 3-9 Connecting APBEs on page 3-64
Connect the amplifiers to other optical components	7	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	8	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	9	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-63
DWDM pre-amp and post-amp site with either C-band or L-band WDM shelves using NT0H31AD ECT for pre-amp and PBEs for post-amp

OM1836p

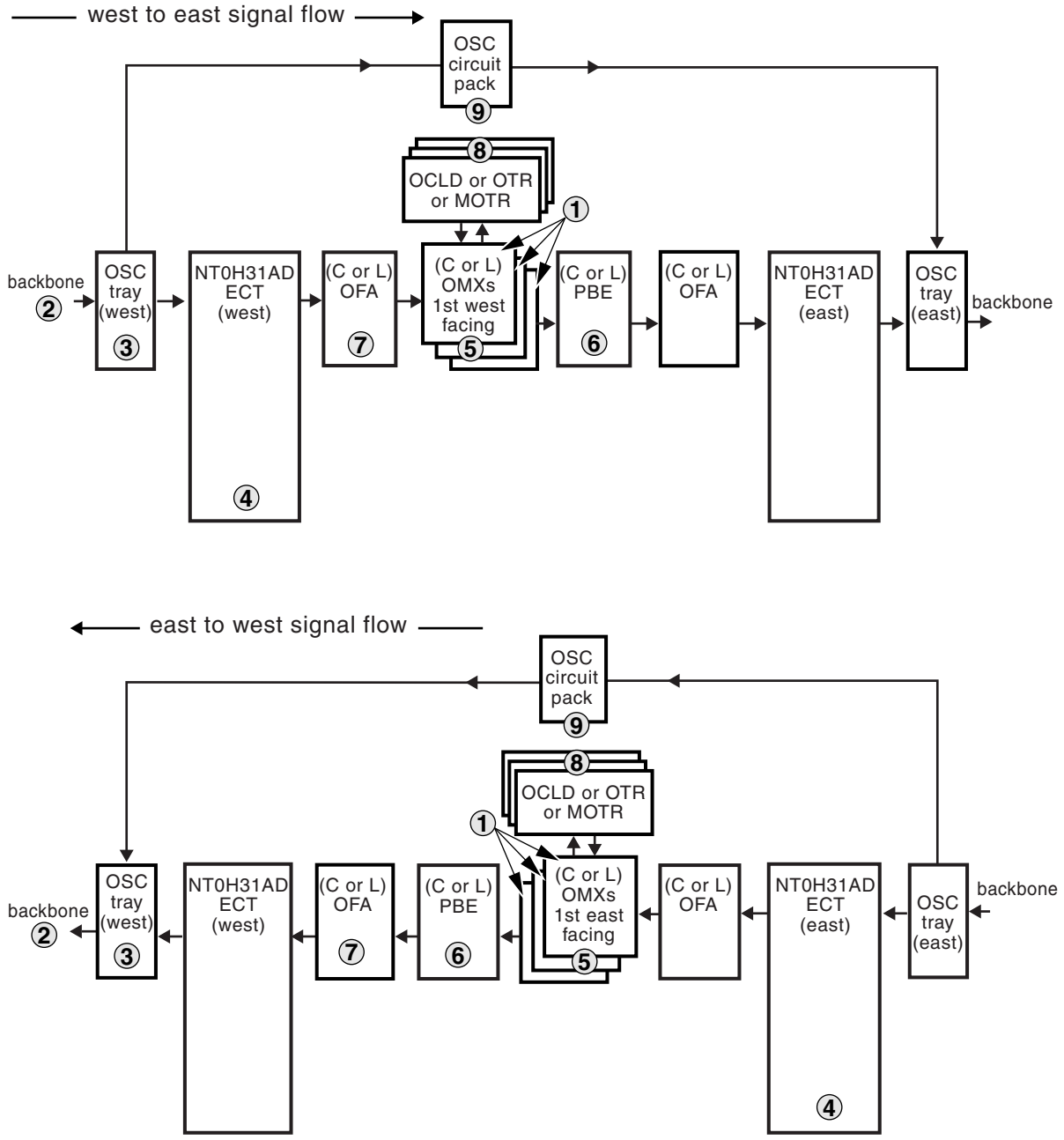


Table 2-67
Optical connections for a DWDM pre-amp and post-amp site with either C-band or L-band WDM shelves using NT0H31AD ECT for pre-amp and PBEs for post-amp

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect ECT to other optical components	4	Procedure 3-7 Connecting ECTs on page 3-52
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the PBE to other optical components	6	Procedure 3-8 Connecting PBEs on page 3-60
Connect the amplifiers to other optical components	7	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	8	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	9	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-64
DWDM pre-amp and post-amp site with parallel WDM shelves using NT0H31AD ECTs for pre-amp and APBEs for post-amp

OM1833p

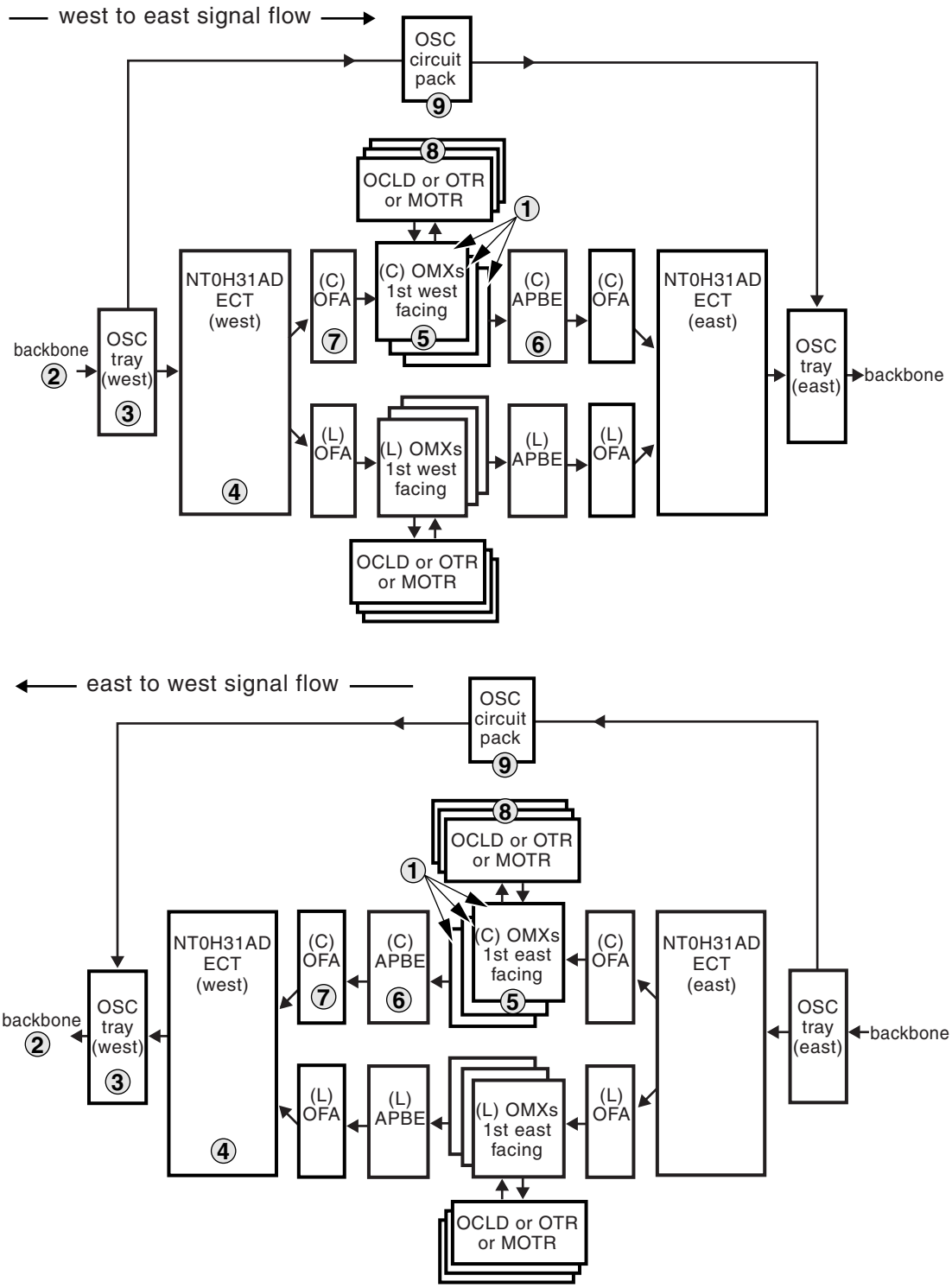


Table 2-68
Optical connections for a DWDM pre-amp and post-amp site with parallel WDM shelves using NT0H31AD ECTs for pre-amp and APBEs for post-amp

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect ECT to other optical components	4	Procedure 3-7 Connecting ECTs on page 3-52
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the APBE to other optical components	6	Procedure 3-9 Connecting APBEs on page 3-64
Connect the amplifiers to other optical components	7	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	8	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	9	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-65
DWDM pre-amp and post-amp site with parallel WDM shelves using NT0H31AD ECTs for pre-amp and PBEs for post-amp

OM1838p

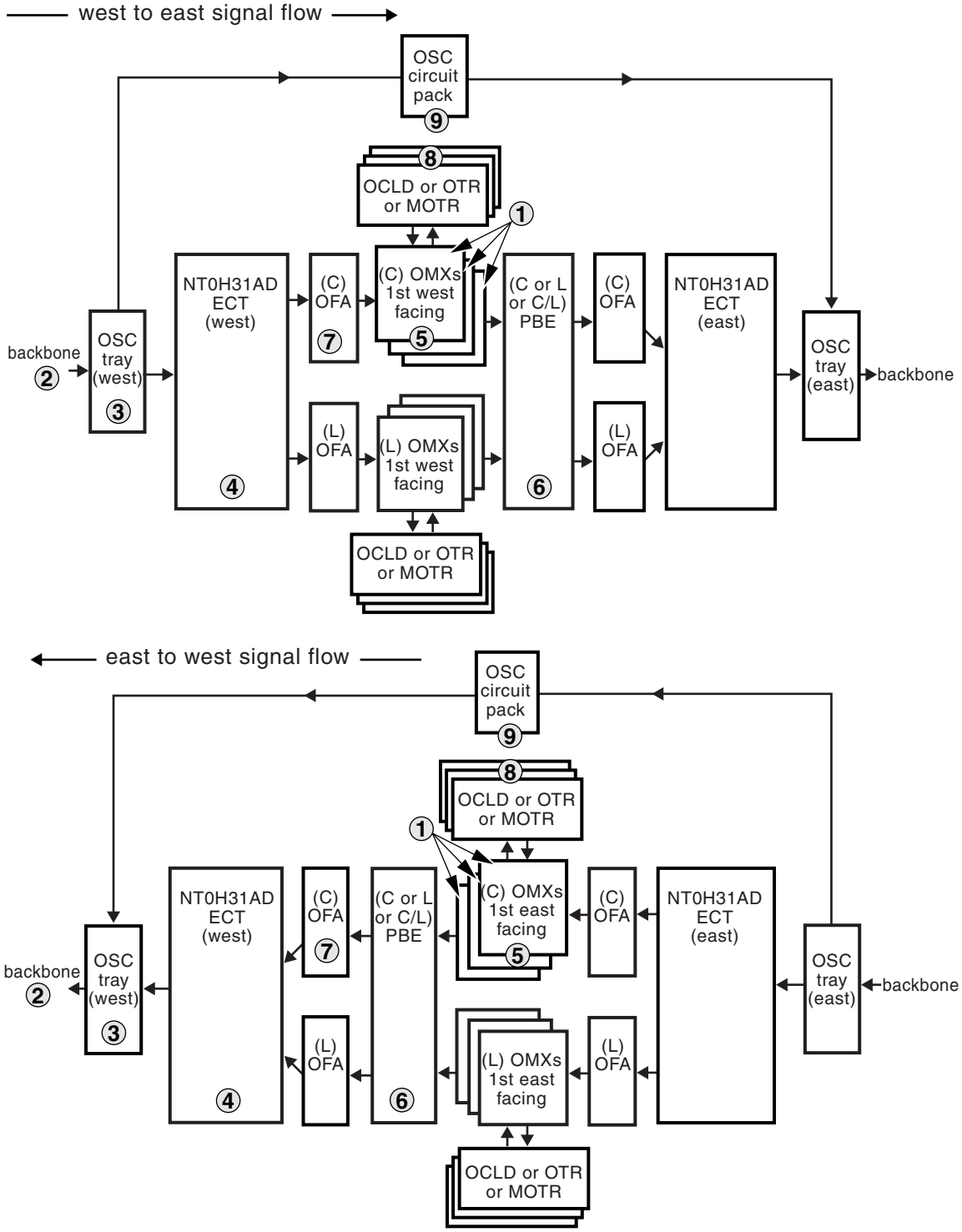


Table 2-69
Optical connections for a DWDM pre-amp and post-amp site with parallel WDM shelves using NT0H31AD ECTs for pre-amp and PBEs for post-amp

Task	Label on figure	Procedure
Connect OMX modules (see Note)	1	Procedure 3-1 Connecting multiple OMXs in a series on page 3-9
Connect the backbone to the first optical component in the site	2	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	3	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect ECT to other optical components	4	Procedure 3-7 Connecting ECTs on page 3-52
Connect the OMX to other optical components	5	Procedure 3-3 Connecting OMXs to other optical components on page 3-28
Connect the PBE to other optical components	6	Procedure 3-8 Connecting PBEs on page 3-60
Connect the amplifiers to other optical components	7	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OMX to OCLD, Muxponder 10 Gbit/s GbE/FC or OTR circuit packs	8	Procedure 3-19 Connecting an OMX to OCLD circuit packs on page 3-113
		Procedure 3-20 Connecting an OMX to OTR circuit packs on page 3-127
		Procedure 3-21 Connecting an OMX to Muxponder (MOTR) circuit packs on page 3-139
		Procedure 3-23 Connecting unused OMX pigtails to OCLD filler cards on page 3-158
Connect the OSC circuit pack	9	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97
Note: The OMX connection depends on the fibering method used at the site; use the guidelines in this chapter to help determine which connection procedure to follow.		

Figure 2-66
DWDM line-amp site using bookended ECTs

OM1357p

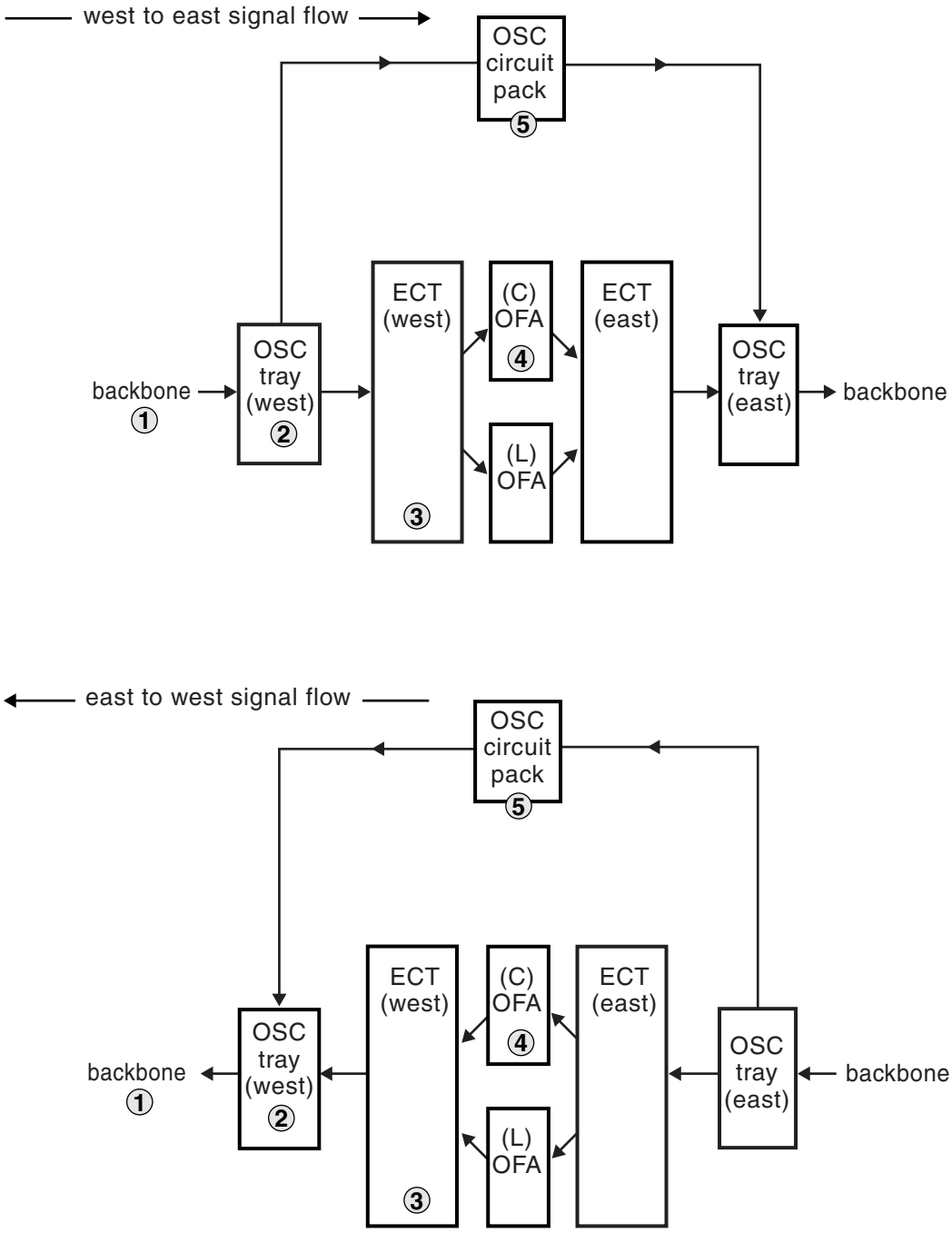


Table 2-70
Optical connections for a DWDM line-amp site using bookended ECTs

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the ECT to other optical components	3	Procedure 3-7 Connecting ECTs on page 3-52
Connect the amplifiers to other optical components	4	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OSC circuit pack	5	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Figure 2-67
DWDM line-amp site using straddled ECTs

OM1358p

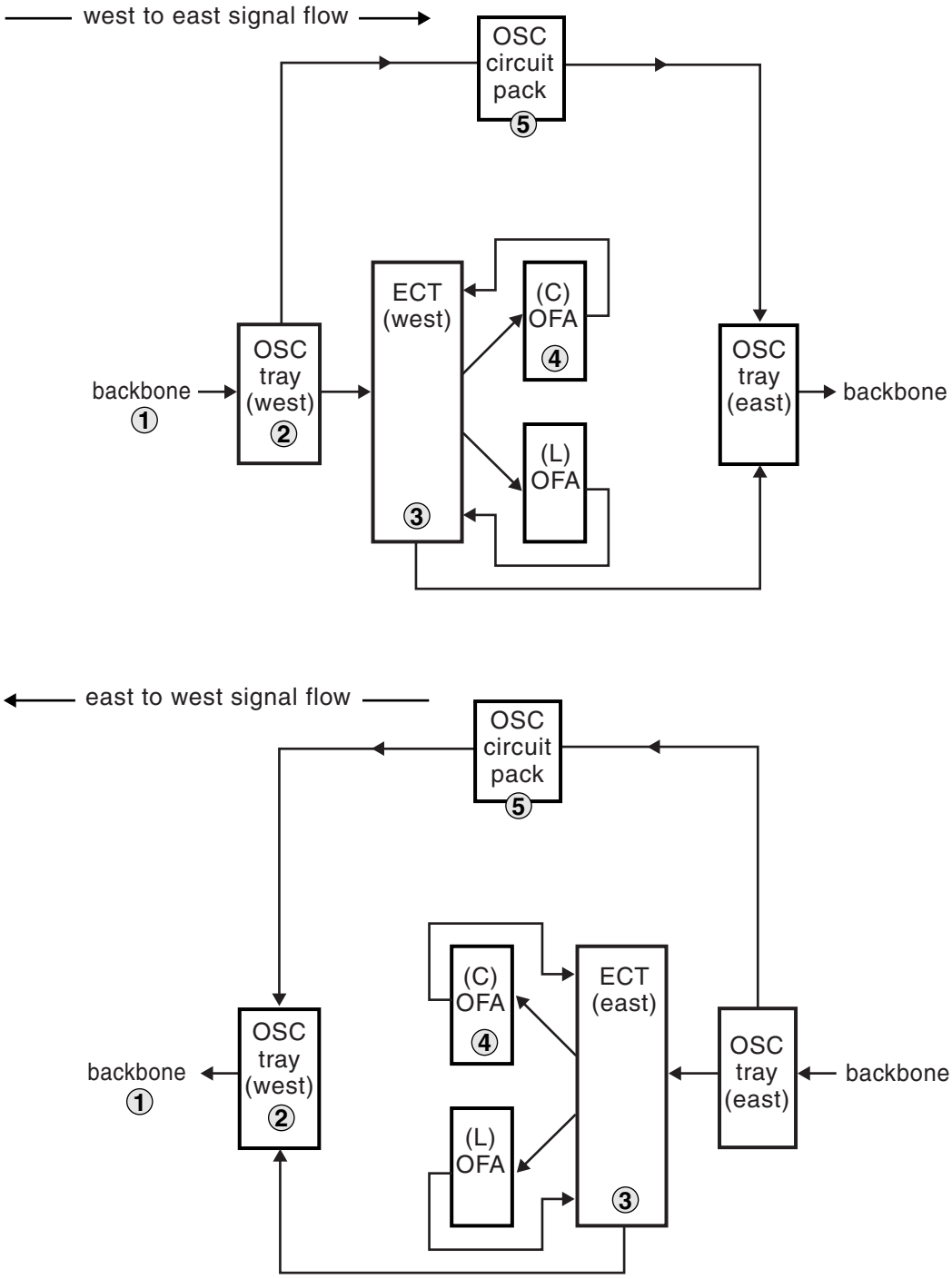


Table 2-71
Optical connections for a DWDM line-amp site using straddled ECTs

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the ECT to other optical components	3	Procedure 3-7 Connecting ECTs on page 3-52
Connect the amplifiers to other optical components	4	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OSC circuit pack	5	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Figure 2-68
DWDM line-amp site with either C-band or L-band signals using bookended ECTs

OM1839p

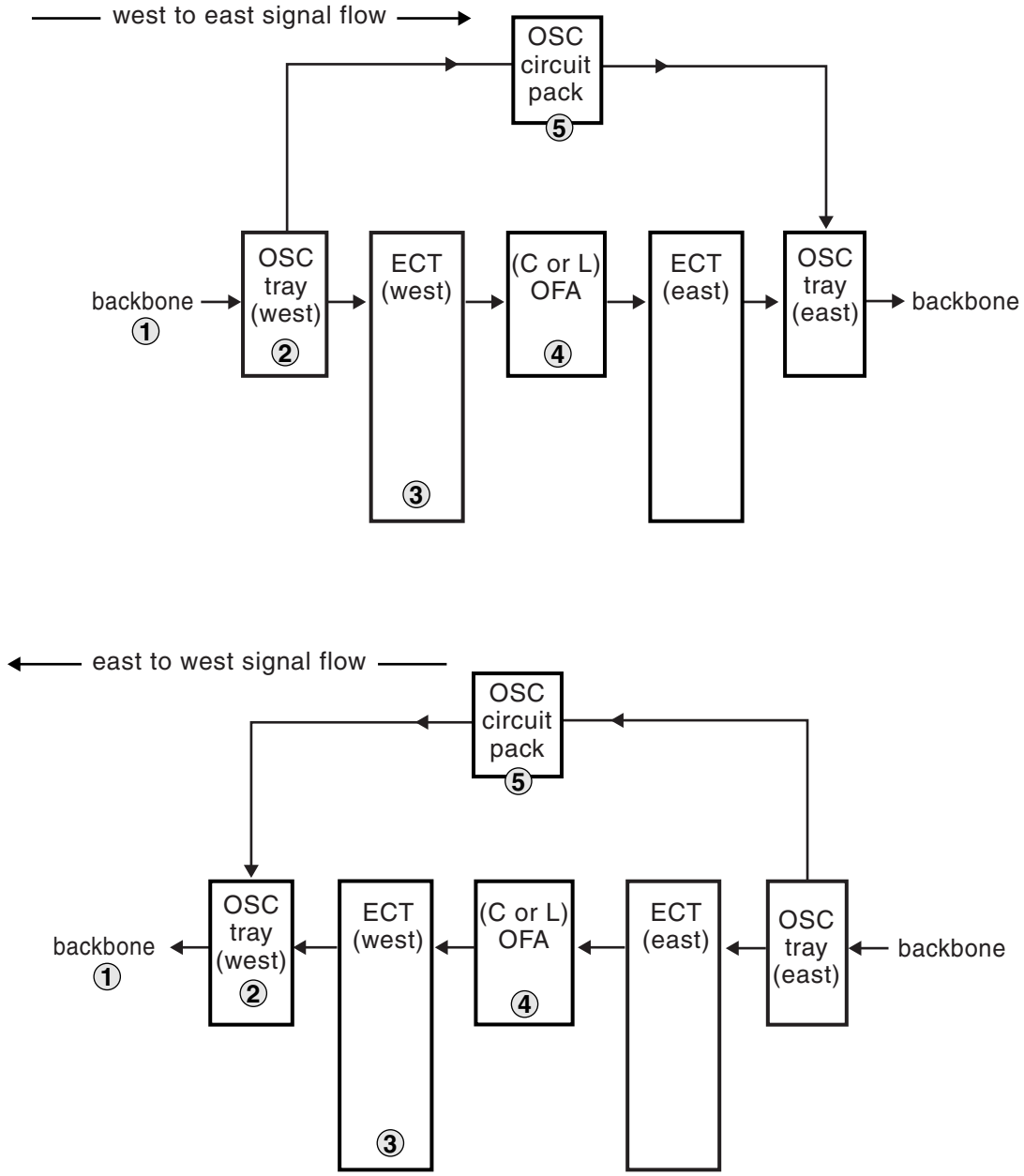


Table 2-72
Optical connections for a DWDM line-amp site with either C-band or L-band signals using bookended ECTs

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the ECT to other optical components	3	Procedure 3-7 Connecting ECTs on page 3-52
Connect the amplifiers to other optical components	4	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OSC circuit pack	5	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Figure 2-69
DWDM line-amp site with either C-band or L-band signals using straddled ECTs

OM1840p

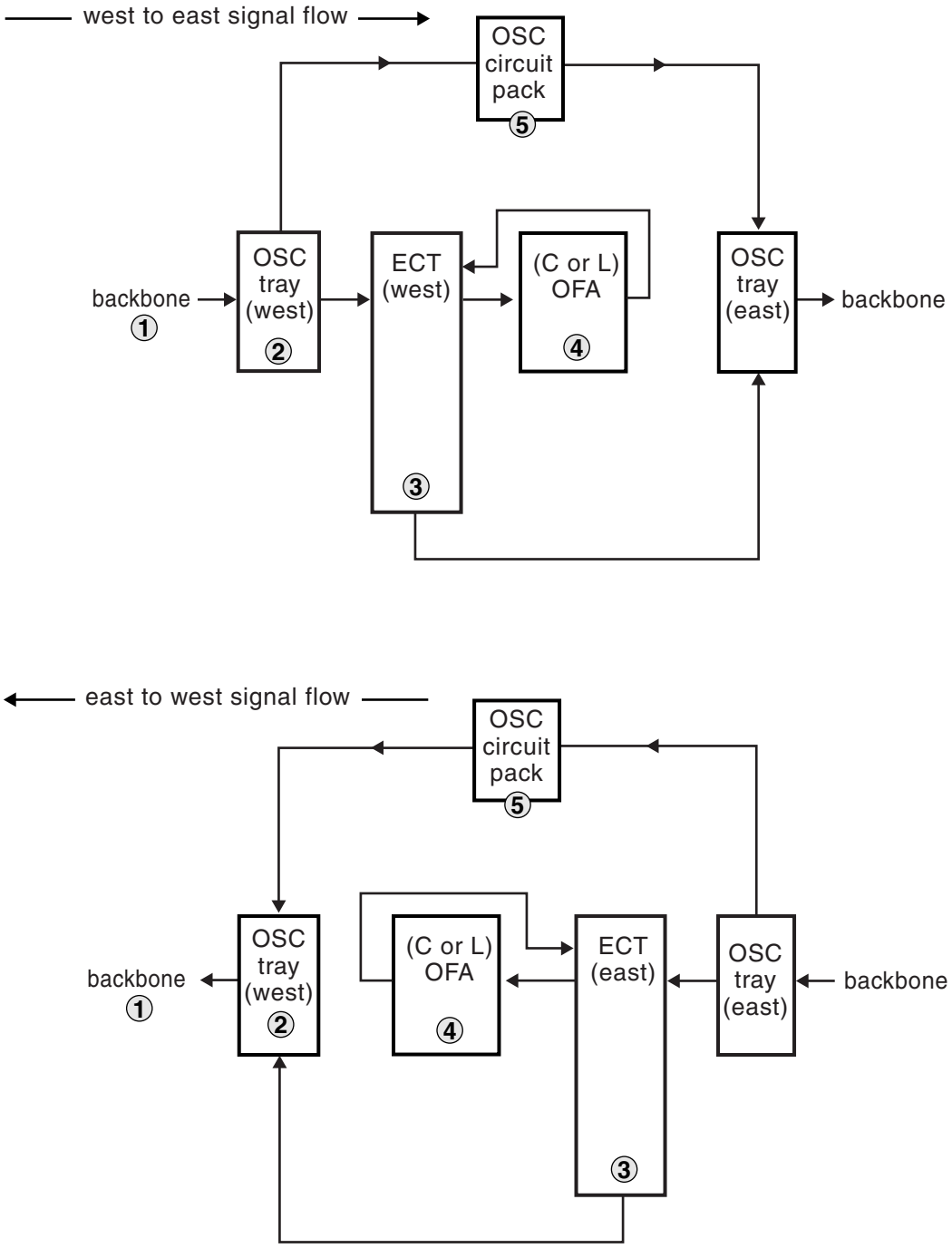


Table 2-73
Optical connections for a DWDM line-amp site with either C-band or L-band signals using straddled ECTs

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the ECT to other optical components	3	Procedure 3-7 Connecting ECTs on page 3-52
Connect the amplifiers to other optical components	4	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the OSC circuit pack	5	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Figure 2-70 on page 2-149 and Figure 2-71 on page 2-150 show line amplifier sites using different configurations for APBEs, C&L splitter/couplers, and NT0H31AD ECTs.

The examples in Figure 2-70 and Figure 2-71 show different band equalization requirements for each direction.

In Figure 2-70, in the west to east direction, the signals are not equalized when they enter the site from the west; they require per-band equalization before entering the amplifier. However, in the east to west direction, per-band equalization has occurred at an upstream site with an amplifier (not shown in the example); the signals are already equalized as they enter the site from the east.

Figure 2-71 shows the same situation in reverse. That is, in the west to east direction, per-band equalization has already occurred at an upstream site with an amplifier (not shown in example); the signals are already equalized as they enter the site from the west. In the east to west direction, the signals are not equalized when they enter the site from the east; they require per-band equalization before entering the amplifier.

Figure 2-70
DWDM line-amp site using APBEs, C&L splitter/couplers and NT0H31AD ECT - Example A

OM2094p

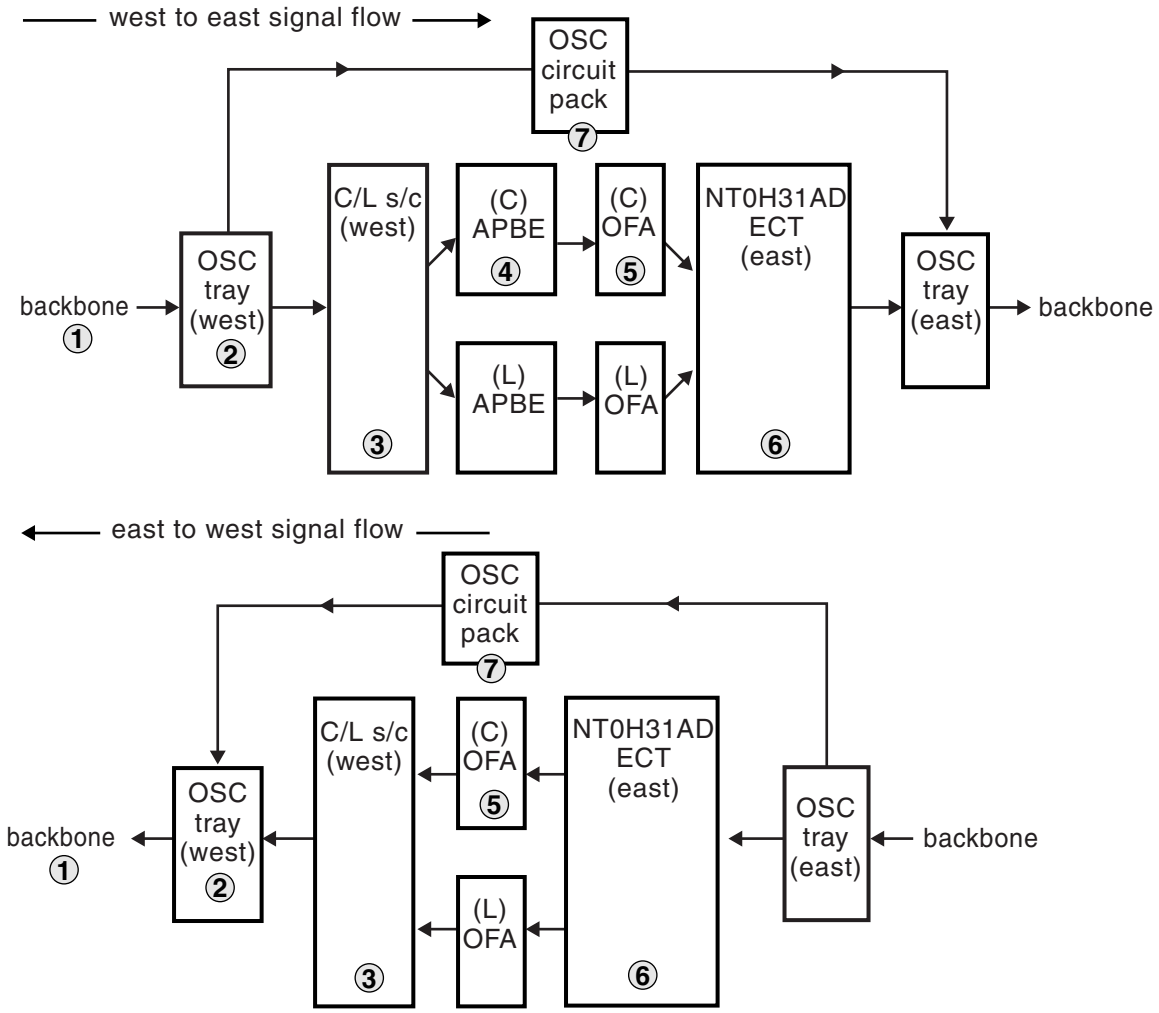


Figure 2-71
DWDM line-amp site using APBEs, C&L splitter/couplers and NT0H31AD ECT - Example B

OM2095p

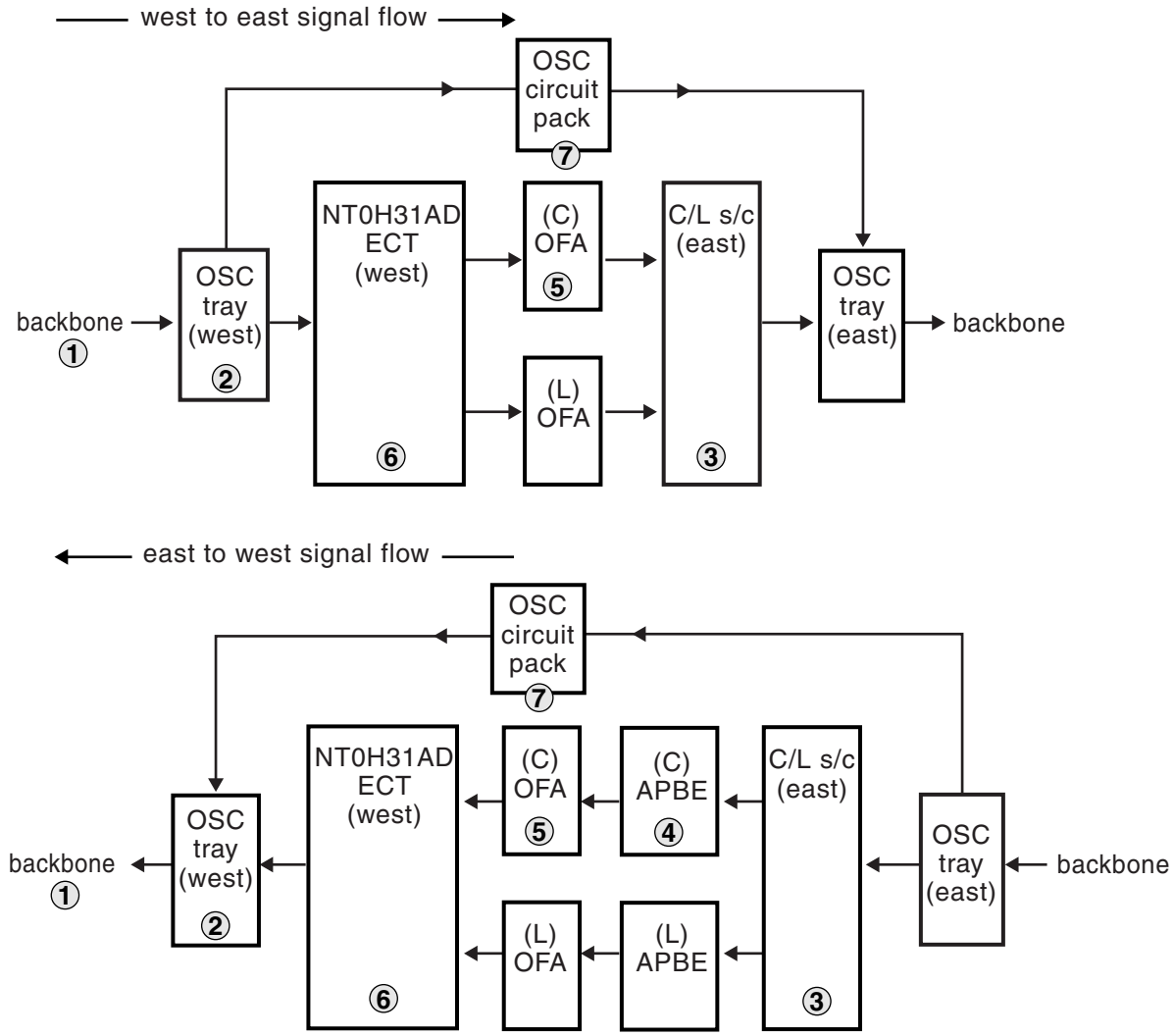


Table 2-74
Optical connections for a DWDM line-amp site using APBEs, C&L splitter/couplers and NT0H31AD ECT

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect C&L coupler/splitters to other optical components	3	Procedure 3-5 Connecting C&L splitter/couplers on page 3-39
Connect the APBE to other optical components	4	Procedure 3-9 Connecting APBEs on page 3-64
Connect the amplifiers to other optical components	5	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the ECT to other optical components	6	Procedure 3-7 Connecting ECTs on page 3-52
Connect the OSC circuit pack	7	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Figure 2-72 on page 2-153 shows examples of DWDM line-amplifier site with either C-band or L-band signals using APBEs and NT0H31AD ECTs. These examples show different band equalization requirements for each direction.

In the top example, in the west to east direction, the signals are not equalized when they enter the site from the west; they require per-band equalization before entering the amplifier. However, in the east to west direction, per-band equalization has occurred at an upstream site with an amplifier (not shown in the example); the signals are already equalized as they enter the site from the east.

The bottom example shows the same situation in reverse. That is, in the west to east direction, per-band equalization has already occurred at an upstream site with an amplifier (not shown in example); the signals are already equalized as they enter the site from the west. In the east to west direction, the signals are not equalized when they enter the site from the east; they require per-band equalization before entering the amplifier.

Design and operational considerations
This C-band only or L-band only configuration can only be modeled using NMT 5.2. If this configuration is modeled using NMT 6.0, the following design and operational considerations must be adhered to:

- to model the NT0H31AD in a C-band only or L-band only configuration, a NT0H31AE C&L splitter/coupler must be placed to fully “bookend” the site (see Figure 2-70 on page 2-149 and Figure 2-71 on page 2-150)
- to compensate for the fact that the NT0H31AE C&L splitter/coupler is not deployed in the field, the amplifier output must be padded with the one modeled by NMT + 1. For example, if 0 dB is modeled, use a 1 dB pad in the field. If a 1 dB pad is modeled, use a 2 dB pad in the field, and so on.

Figure 2-72
DWDM line-amp site with either C-band or L-band signals using APBEs and NT0H31AD ECTs

OM2103p

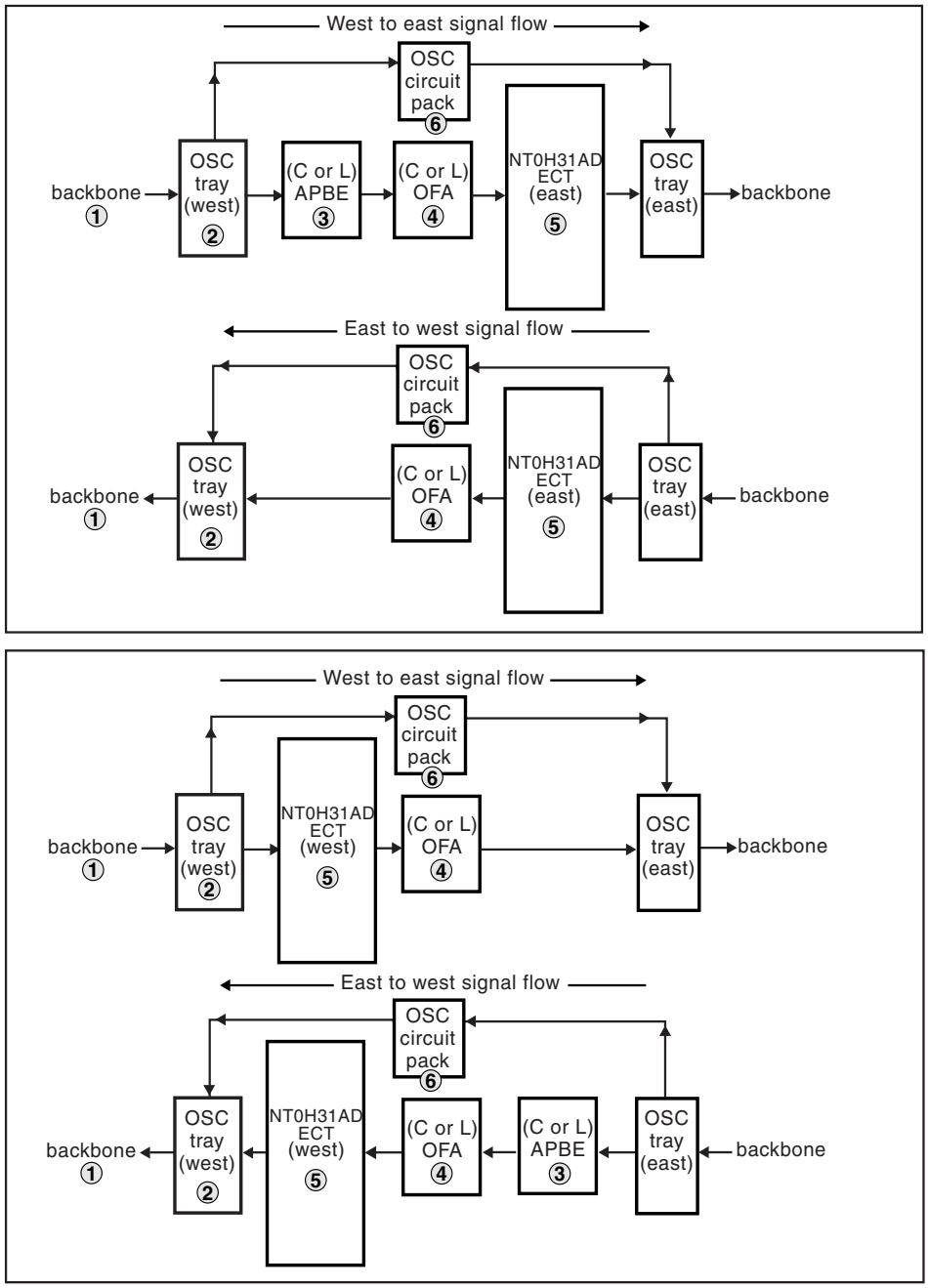


Table 2-75
Optical connections for a DWDM line-amp site with either C-band or L-band signals using APBEs and NT0H31AD ECTs

Task	Label on figure	Procedure
Connect the backbone to the first optical component in the site	1	Procedure 3-36 Connecting a site to the backbone on page 3-269
Connect the OSC tray to other optical components	2	Procedure 3-15 Connecting OSC trays to other optical components on page 3-93
Connect the APBE to other optical components	3	Procedure 3-9 Connecting APBEs on page 3-64
Connect the amplifiers to other optical components	4	Procedure 3-11 Connecting OFA circuit packs on page 3-72
Connect the ECT to other optical components	5	Procedure 3-7 Connecting ECTs on page 3-52
Connect the OSC circuit pack	6	Procedure 3-16 Connecting OSC trays to an OSC circuit pack on page 3-97

Guidelines for implementing straddled and bookended configurations for ECTs and C&L splitter/couplers

Follow these guidelines for connecting components to ECTs or C&L splitter/couplers. ECTs and C&L splitter/couplers can be implemented in one of two ways:

- straddled configurations
- bookended configurations

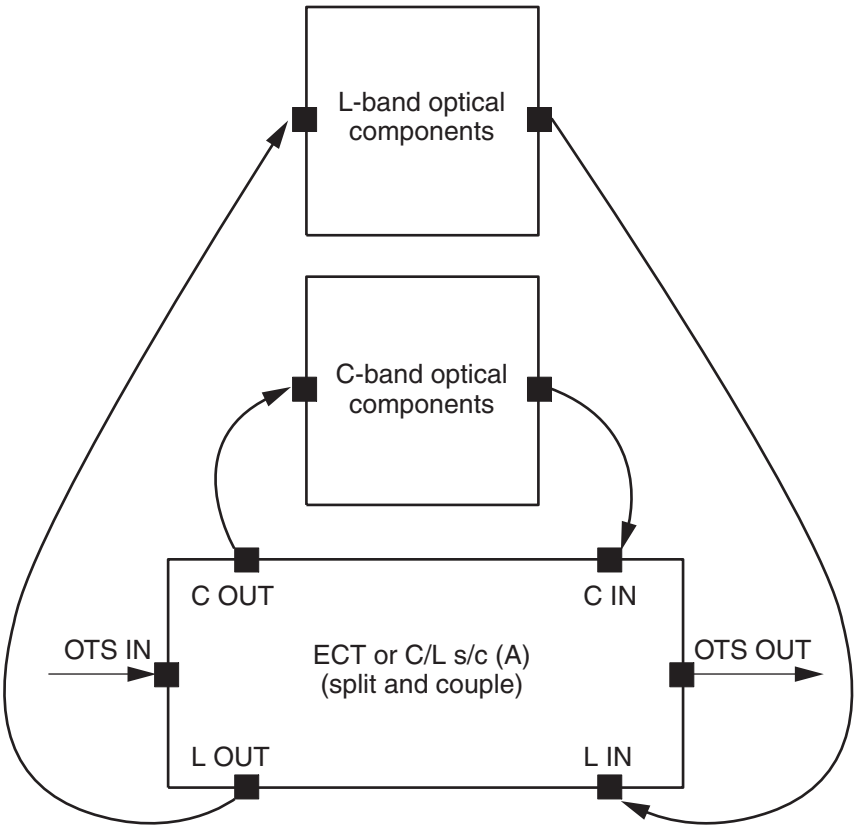
In straddled configurations, one component performs both the splitting and the coupling operations.

In most cases, C&L splitter/couplers should not straddle WDM shelves; if the straddled C&L splitter/coupler fails, a loss of traffic could occur in both directions. Use straddled C&L splitter/couplers around amplifiers where the C-band and L-band signals require splitting and coupling in one direction only.

Figure 2-73 on page 2-156 shows a straddled configuration. If the signal flowing in the opposite direction also requires splitting and coupling, then another ECT or C&L splitter/coupler is used. This figure only shows one direction of the signal flow.

Figure 2-73
Straddled configuration

OM1258p



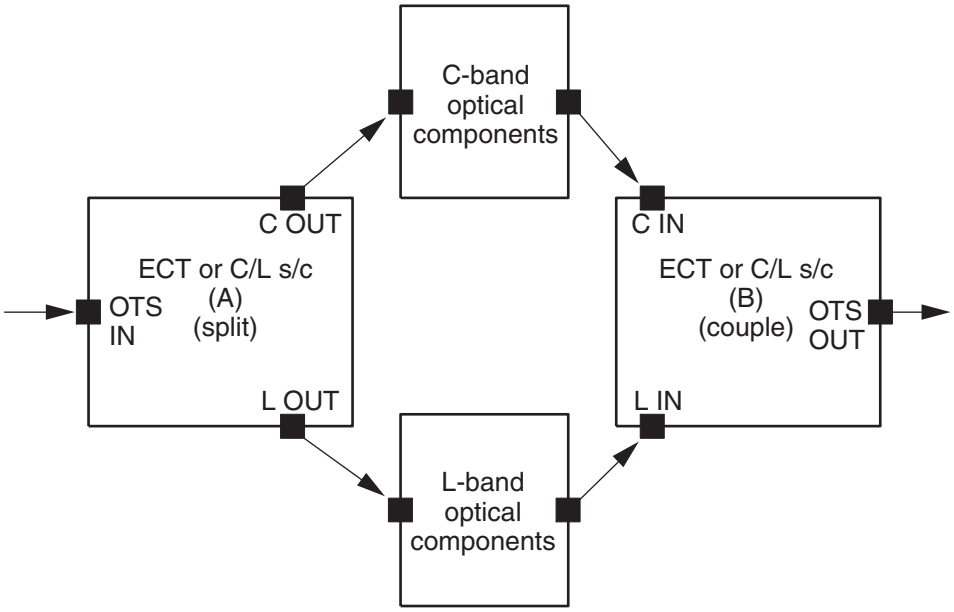
In bookended configurations, one component (east or west) performs the splitting operation and another component (west or east) performs the coupling operation.

Bookended configurations are recommended for sites with WDM shelves, and sites where the C-band and L-band signals require splitting and coupling in both directions. Bookended configurations ensure that one direction of traffic remains in service in the event of a failure at a single C&L splitter/coupler.

Figure 2-74 shows a bookended configuration. For simplicity only one direction of signal flow is shown into and out of the components.

Figure 2-74
Bookended configuration

OM1251p



Precautions

CAUTION
Invisible laser radiation
The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

CAUTION
Risk of affecting network reliability
You must always clean the fiber connectors before you make connections to ensure network reliability.

CAUTION
Possible risk of damage to equipment and fiber
Make sure that the bulkhead connectors are lowered and snapped into place before closing any drawers. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the any drawers. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

Guidelines for routing fiber

Guideline	Detail
1	When connecting a component to the OTS IN port of the ECT or C&L splitter/coupler, note whether the component is east or west.
2	When connecting a component to the C&L OUT port of the ECT or C&L splitter/coupler, note whether the component is east or west.
3	For straddled configurations, when connecting a component to the C&L IN port of the ECT or C&L splitter/coupler, make the connection to the same ECT or C&L splitter/coupler (east to east or west to west). For bookended configurations, when connecting a component to the C&L IN port of the ECT or C&L splitter/coupler, make the connection to the second ECT or C&L splitter/coupler (west to east or east to west).
4	For straddled configurations, when connecting a component to the OTS OUT port of the ECT or C&L splitter/coupler, make the connection to the same ECT or C&L splitter/coupler (east to east or west to west). For bookended configurations, when connecting a component to the OTS OUT port of the ECT or C&L splitter/coupler, make the connection to the second ECT or C&L splitter/coupler (west to east or east to west).

Guidelines for determining the east-most and west-most OMXs in a series of interconnected OMXs

Most sites, excluding OFA sites, contain at least one series of interconnected OMXs. When you connect optical components to a series of interconnected OMXs, you connect the optical component to the east-most and/or west-most OMX in the series.

The fibering method used to interconnect the OMXs determines which OMXs are the east-most and west-most OMX in the series. Figure 2-75 on page 2-160 shows a series of interconnected C-band OMXs with different fibering methods. Although the bands in all three examples are the same, the east-most and west-most OMXs differ, according to the fibering method used. Use this figure as a guide to determine the east-most and west-most OMXs in your configuration.

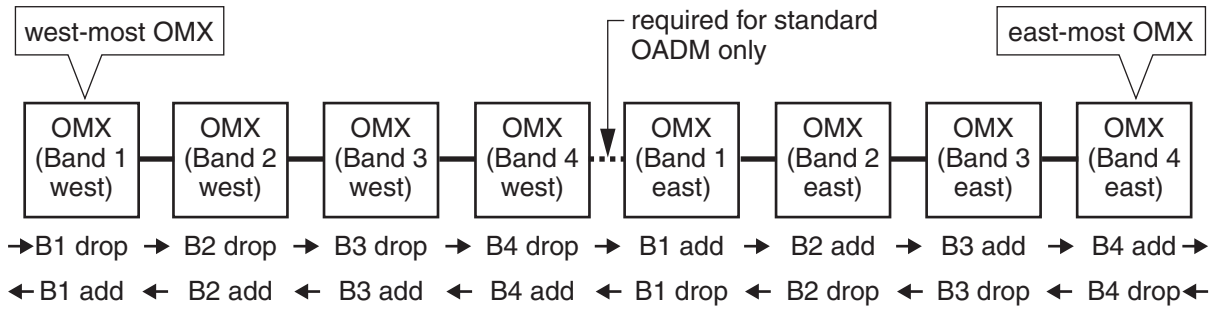
> ***Note:*** The bands shown in the examples in Figure 2-75 on page 2-160 are sequential. That is, the band 1 OMX connects to the band 2 OMX, and so on. The bands at your site may be connected in a different sequence. Consult your network plan.

For OMX fibering procedures, see Procedure 3-1 through Procedure 3-3.

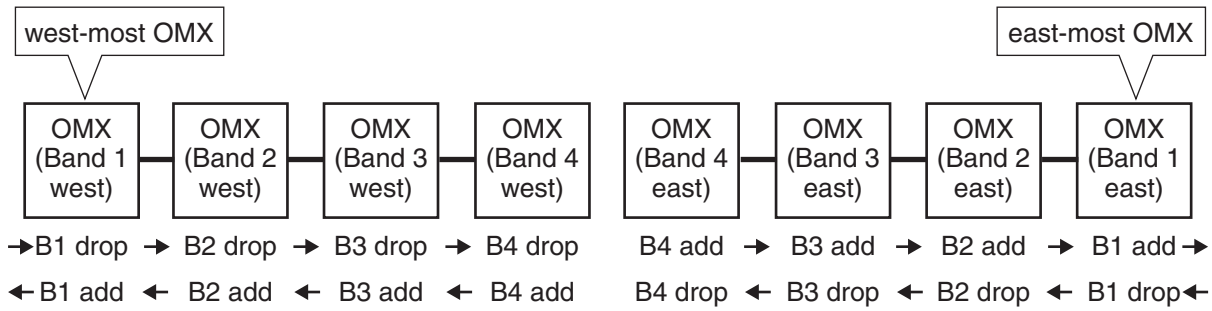
Figure 2-75
Determining the east-most and west-most OMXs in a series

OM1796p

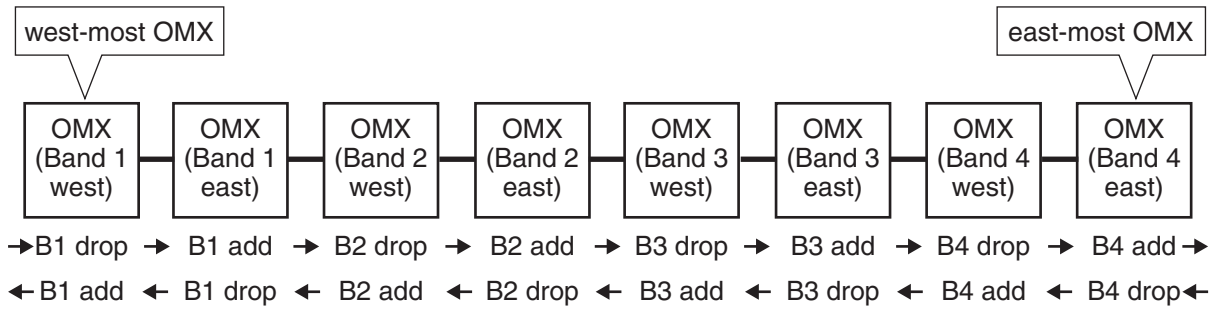
Standard OADM and standard terminal OMX fibering



Stacked terminal OMX fibering



Single-shelf OMX fibering



Nortel

Optical Metro 5100/5200

Connection Procedures, Part 1 of 2

323-1701-221
Standard Release 8.0 Issue 1
April 2005
Printed in Canada and the United Kingdom

NORTEL