



Install the Bay and Backplane Connections

This chapter provides procedures for installing the Cisco ONS 15600. To view a summary of the tools and equipment required for installation, see the [“Required Tools and Equipment”](#) section on page 1-2.

Before You Begin

This section lists the chapter procedures (NTPs). Turn to a procedure for applicable tasks (DLPs). Perform these procedures in the order they appear.

1. [NTP-E1 Unpack and Inspect the ONS 15600 Bay Assembly, page 1-4](#)—Complete this procedure before continuing with the [“NTP-E2 Install the Bay Assembly”](#) procedure on page 1-5.
2. [NTP-E2 Install the Bay Assembly, page 1-5](#)—Complete this procedure to install the bay assembly.
3. [NTP-E186 Install Additional Shelf Assemblies in the Bay \(Two People\), page 1-6](#)—Complete this procedure to install up to two additional shelf assemblies in a bay.
4. [NTP-E3 Open and Remove the Front Door, page 1-7](#)—Complete this procedure to access the equipment before continuing with other procedures in this chapter.
5. [NTP-E104 Install Cable Routing Modules and Kick Plates, page 1-9](#)—Complete as needed to remove the existing cable routers and install the cable routing modules (CRMs).
6. [NTP-E4 Install the Bay Power and Ground, page 1-10](#)—Complete this procedure before continuing with the [“NTP-E5 Remove the Rear Cover”](#) procedure on page 1-12.
7. [NTP-E5 Remove the Rear Cover, page 1-12](#)—Complete this procedure before continuing with the [“NTP-E6 Install Wires to Alarm, Timing, LAN, and Craft Pin Connections”](#) procedure on page 1-12.
8. [NTP-E6 Install Wires to Alarm, Timing, LAN, and Craft Pin Connections, page 1-12](#)—Complete as needed to set up connections on the backplane.
9. [NTP-E8 Replace the Rear Cover, page 1-13](#)—Complete as needed to install the rear cover.
10. [NTP-E7 Perform the Bay Installation Acceptance Test, page 1-14](#)—Complete this procedure to determine if you have correctly completed all other procedures in the chapter.



Warning

Only trained and qualified personnel should be allowed to install, replace, or service this equipment.
Statement 1030

**Warning**

This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.

Statement 1017

**Warning**

This unit must be installed in a rack that is secured to the building structure. Statement 205

Required Tools and Equipment

You will need the following tools and equipment to install and test the ONS 15600.

Included Materials

The ONS 15600 bay ship kit is shipped with the ONS 15600. The under-floor power kit is an optional item and is used in environments where power is supplied through the floor, rather than overhead. You can also order installation dollies to help you with unloading the bay from the shipping pallet; for information on obtaining the dollies, contact your Cisco sales engineer.

The number in parentheses gives the part number or the quantity of the item included in the package.

- Bay ship kit (53-2141-XX)
 - Bay label
 - Floor template
 - ESD ground strap
 - Rectangular seismic washers (4)
 - *Cisco Optical Transport Products Safety and Compliance Information*
- Under-floor power kit (800-23062-XX) (optional)
 - Screws and washers, #8 x 0.75 inch (12)
 - Screws and washers, #8 x 0.375 inch (8)
 - Power conduits (2)
 - Cable strain-relief brackets (2)
- Wide CRM kit (53-2181-XX) (optional)
 - Latch catches (2 left and 2 right)
 - Velcro tie-wrap (26)
 - Wide CRMs (2; left and right)
 - 6-32 panhead screws (8; for latch catches)
 - 8-32 panhead screws (10; for wide CRMs)
- Narrow CRM kit (53-2193-01) (optional)
 - Fiber radiuses (2; left and right)
 - Narrow CRMs (2; left and right)
 - 6-32 panhead screws (4; for fiber radiuses)

- 8-32 panhead screws (6; for narrow CRMs)
- 900-mm kick plate kit (53-2178-01) (optional)
 - Front kick plate
 - Rear kick plate
 - Side kick plates (2)
 - 8-32 flathead screws (18)
- 600-mm kick plate kit (53-2177-XX) (optional)
 - Front kick plate
 - Rear kick plate
 - 8-32 flathead screws (10)

User-Supplied Materials

The following materials and tools are required but are not supplied with the ONS 15600:

- Power cable, rated for at least 125-A capacity
- Ground cable, rated for at least 125-A capacity
- Marking pen
- Concrete drill
- Listed pressure terminal connectors such as two-hole ring; connectors must be suitable for the chosen cable
- Two-hole power lugs, 0.625-inch hole spacing, 0.25-inch bolt holes (2 for grounding, 4 for each shelf), for underfloor-routed power cables (Panduit LCCF2-14AZFW-E)
- #22 or #24 AWG CAT-5e alarm wires
- Straight-through (CAT-5) LAN cables, shielded (if using an external LAN connection)
- Male 15-pin D-sub shielded cable (if using the audible [external] alarms option)
- EIA/TIA-232C shielded cable (9 pin D-sub to 9 pin D-sub) (2)
- 75-ohm coaxial cable (BNC connectors on both ends) (optional)
- Ladder (optional)

Tools Needed

- Wire-wrap tool (suitable for #22 to #28 AWG alarm wires)
- Wire cutters
- Wire strippers
- Crimp tool
- Scissors
- #2 Phillips screwdriver, 6 inches long
- 3/4-inch socket wrench
- Ratchet

- 6-inch (or greater) ratchet extension (optional)
- 3/4-inch socket
- 1 1/8-inch socket
- 15/16-inch socket
- 7/16-inch nut driver or socket
- 9/64-inch Allen wrench

Test Equipment

- Voltmeter
- Visible laser source
- Optical power meter

NTP-E1 Unpack and Inspect the ONS 15600 Bay Assembly

Purpose	This procedure explains how to unpack the ONS 15600 and verify the contents.
Tools/Equipment	Scissors Phillips screwdriver 3/4-inch socket wrench
Prerequisite Procedures	None
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Step 1 Complete the [“DLP-E1 Unpack and Verify the Bay Assembly”](#) task on page 16-1.

Step 2 Complete the [“DLP-E2 Inspect the Bay Assembly”](#) task on page 16-3.

Step 3 Continue with the [“NTP-E2 Install the Bay Assembly”](#) procedure on page 1-5.

Stop. You have completed this procedure.

NTP-E2 Install the Bay Assembly

Purpose	This procedure explains how to install the bay assembly at the site.
Tools/Equipment	Ratchet 6-inch (or greater) ratchet extension (optional) 1 1/8-inch socket 15/16-inch socket Rectangular seismic washers (4) (53-2141-XX) 5/8-inch floor anchor bolts (4)
Prerequisite Procedures	NTP-E1 Unpack and Inspect the ONS 15600 Bay Assembly, page 1-4
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None



Warning

This unit must be installed in a rack that is secured to the building structure. Statement 205



Warning

To prevent airflow restriction, allow at least 24 inches (60 cm) of clearance around the ventilation openings.



Warning

To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of: 122°F (50°C). Statement 1047

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- Step 1** Complete the [“DLP-E109 Drill Holes to Anchor and Provide Access to the Bay Assembly”](#) task on page 17-9.
- Step 2** Complete the [“DLP-E3 Install the Dollies onto the Bay Assembly”](#) task on page 16-3.
- Step 3** Complete the [“DLP-E4 Install the Bay Assembly”](#) task on page 16-6.
- Step 4** Continue with the [“NTP-E3 Open and Remove the Front Door”](#) procedure on page 1-7.
- Stop. You have completed this procedure.**
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NTP-E186 Install Additional Shelf Assemblies in the Bay (Two People)

Purpose	This procedure explains how to install a second or third shelf assembly in a previously-installed bay assembly. Due to the weight of the shelf assembly, this procedure requires two people to install a shelf assembly.
Tools/Equipment	Ratchet 6-inch (or greater) ratchet extension (optional) 1 1/8-inch socket 15/16-inch socket Rectangular seismic washers (4) (53-2141-XX) 5/8-inch floor anchor bolts (4)
Prerequisite Procedures Required/As Needed	NTP-E2 Install the Bay Assembly, page 1-5 As needed
Onsite/Remote	Onsite
Security Level	None



Warning

This unit must be installed in a rack that is secured to the building structure. Statement 205



Warning

To prevent airflow restriction, allow at least 24 inches (60 cm) of clearance around the ventilation openings. Statement 1076



Warning

To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of: 122°F (50°C). Statement 1047

- Step 1** Remove the plastic front and rear covers.
- Step 2** Slide the shelf assembly into position.
- Step 3** At the rear of the shelf assembly, locate the clear plastic covers over the bus bars. There are four plastic covers on each side of the shelf.
- Step 4** Remove the nuts, and use a Phillips screwdriver to remove the four screws that attach the clear plastic covers to the appropriate (middle or bottom) bus bars.
- Step 5** Attach the shelf assembly to the appropriate bus bars.
- Step 6** Connect the shelf assembly power cable to the PDU.
- Step 7** Connect the green ground wires, which were preinstalled, to the node.
- Step 8** Continue with the [“NTP-E3 Open and Remove the Front Door” procedure on page 1-7.](#)

Stop. You have completed this procedure.

NTP-E3 Open and Remove the Front Door

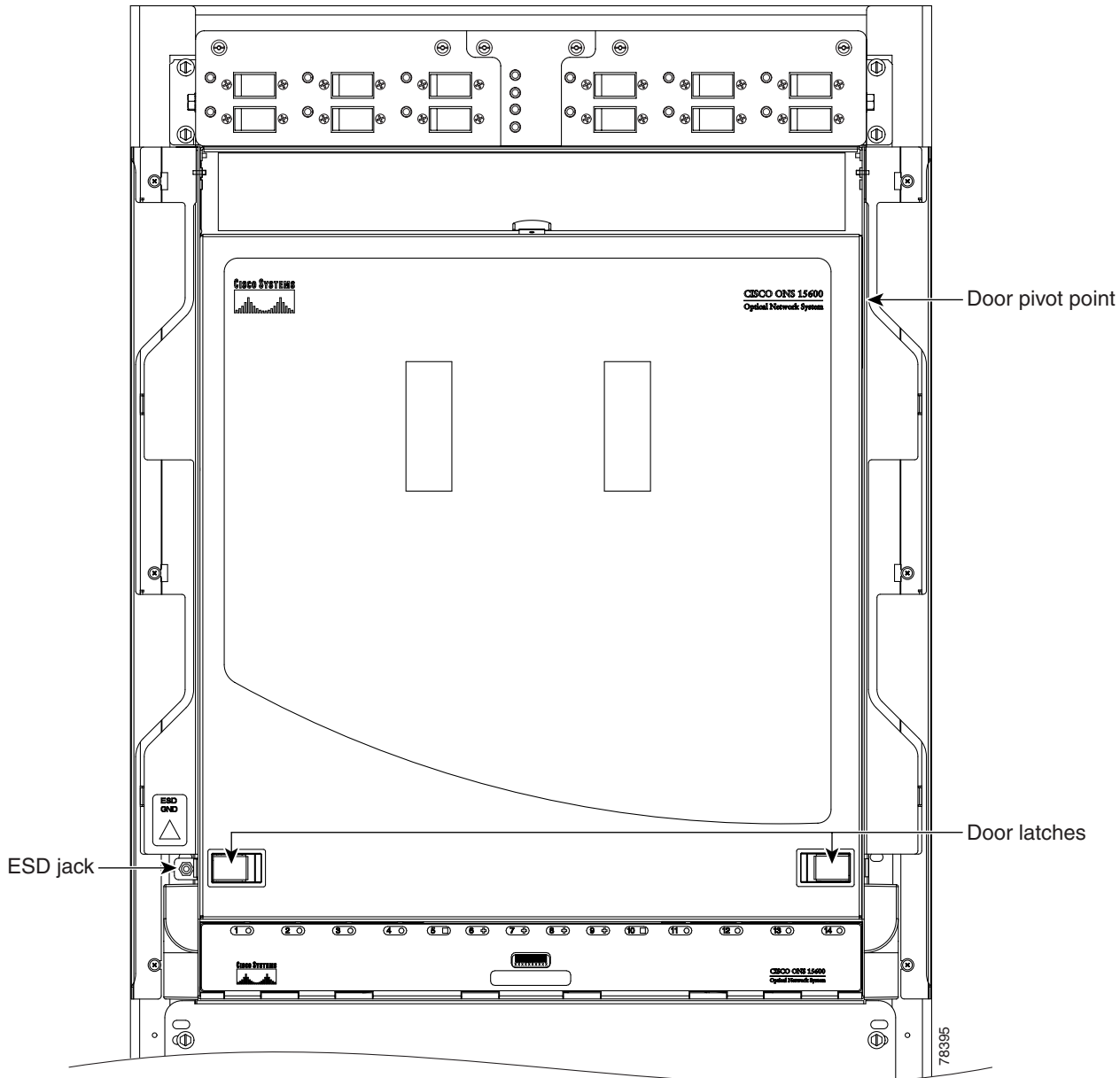
Purpose	This procedure explains how to open and remove the front door to access the ONS 15600 shelf, including the card cage area and fan trays.
Tools/Equipment	None
Prerequisite Procedures	NTP-E2 Install the Bay Assembly, page 1-5
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

**Note**

The ONS 15600 has an ESD plug input and is shipped with an ESD wrist strap. One ESD plug input is located on the outside edge of the shelf on the left-hand side, and the other is located at the bottom rear of the shelf. It is labeled “ESD.” Always wear an ESD wrist strap and connect the strap to the ESD plug when working on the ONS 15600.

Step 1 Locate the latches on the bottom left and right sides of the door ([Figure 1-1](#)).

Figure 1-1 ONS 15600 Front Door



- Step 2** Pull each latch outward to release them.
- Step 3** Swing the door up to open it.
- Step 4** Lift the door off its hinge pins and remove it. Set the door aside so you can reinstall it after you complete [Chapter 2, "Install Cards and Fiber-Optic Cable."](#)

Step 5 If you want to install CRMs, continue with the [“NTP-E104 Install Cable Routing Modules and Kick Plates” procedure on page 1-9](#). If CRMs are already installed, continue with the [“NTP-E4 Install the Bay Power and Ground” procedure on page 1-10](#).

Stop. You have completed this procedure.

NTP-E104 Install Cable Routing Modules and Kick Plates

Purpose	This procedure explains how to install narrow CRMs or, if necessary, remove any previously installed narrow CRMs and install the wide CRMs.
Tools/Equipment	<p>Screwdriver</p> <p>Retaining screws</p> <p>900-mm kick plates (53-2178-01)</p> <p>Wide cable routing module (CRM) kit (53-2181-XX) (optional):</p> <ul style="list-style-type: none"> • Latch catches (2 left and 2 right) • Velcro tie-wrap (26) • Wide CRMs (2 left and 2 right) • 6-32 panhead screws (8; for latch catches) • 8-32 panhead screws (10; for wide CRMs) <p>Narrow CRM kit (53-2193-01) (optional):</p> <ul style="list-style-type: none"> • Fiber radiuses (2; left and right) • Narrow CRMs (2; left and right) • 6-32 panhead screws (4; for fiber radiuses) • 8-32 panhead screws (6; for narrow CRMs)
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None



Note To accommodate the CRMs, the bay must have 150 millimeters (6 inches) of open space on either side (900-mm [35.4-inch] footprint).



Note Two people are required to perform this procedure.

Step 1 If you want to install narrow CRMs, complete the [“DLP-E142 Install the Narrow CRMs” task on page 17-33](#).

Step 2 If you need to remove narrow CRMs (vertical fiber routers) so you can install wide CRMs, complete the [“DLP-E120 Remove the Narrow CRMs” task on page 17-18](#).

- Step 3** If you want to install wide CRMS and have 600-mm (23.6-in.) kick plates installed, complete the “[DLP-E121 Replace the Existing 600-mm Kick Plates with 900-mm Kick Plates](#)” task on page 17-20.
- Step 4** If you want to install the wide CRMs, complete the “[DLP-E143 Install the Wide CRMs](#)” task on page 17-34.
- Step 5** Continue with the “[NTP-E4 Install the Bay Power and Ground](#)” procedure on page 1-10.
- Stop. You have completed this procedure.**
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NTP-E4 Install the Bay Power and Ground

Purpose	This procedure explains how to install power feeds and ground the ONS 15600.
Tools/Equipment	<p>7/16-inch nut driver or socket</p> <p>9/64-inch Allen wrench</p> <p>Power cable, rated for at least 125-A capacity</p> <p>Ground cable, rated for at least 125-A capacity</p> <p>Listed pressure terminal connectors such as ring and fork types; connectors must be suitable for the chosen cable</p> <p>Wire cutters</p> <p>Wire strippers</p> <p>Crimp tool</p> <p>Screwdriver</p> <p>Nuts (4)</p> <p>Two-hole power lugs, 0.625-inch hole spacing; 0.25-inch bolt holes (Panduit LCCF2-14AZFW-E) (for underfloor-routed power cables) (16)</p> <p>Under-floor power kit (800-23062-XX) (optional):</p> <ul style="list-style-type: none"> • Screws (#8 x 0.75 inch) and washers (12) • Screws (#8 x 0.375 inch) and washers (8) • Power conduits (2) • Cable strain-relief brackets (2)
Prerequisite Procedures	<p>NTP-E2 Install the Bay Assembly, page 1-5</p> <p>NTP-E3 Open and Remove the Front Door, page 1-7</p>
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None



Warning

This product requires short-circuit (overcurrent) protection, to be provided as part of the building installation. Install only in accordance with national and local wiring regulations. Statement 1045

**Warning**

Before connecting or disconnecting ground or power wires to the chassis, ensure that power is removed from the DC circuit. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position. Statement 140

**Warning**

This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024

**Warning**

A readily accessible two-poled disconnect device must be incorporated in the fixed wiring. Statement 1022

**Warning**

Use copper conductors only. Statement 1025

**Caution**

Always use the supplied ESD wristband when working with a powered ONS 15600. Plug the wristband cable into either the ESD jack located on the lower-left outside edge of the bay assembly, or the other ESD jack located at the bottom rear of the shelf.

- Step 1** Complete the [“DLP-E5 Connect the Office Ground to the ONS 15600”](#) task on page 16-7.
- Step 2** Complete the [“DLP-E145 Connect the PDU Ground Cables to the PDU”](#) task on page 17-37.
- Step 3** If isolated logic ground is required at this site, complete the [“DLP-E146 Install Isolated Logic Ground”](#) task on page 17-39.
- Step 4** Complete the [“DLP-E8 Connect Office Power to the ONS 15600 Bay”](#) task on page 16-11.
- Step 5** If the site is in a raised-floor environment with underfloor power, complete the optional [“DLP-E9 Route and Terminate Raised-Floor Power Cables”](#) task on page 16-13.
- Step 6** Complete the [“DLP-E10 Verify Office Power”](#) task on page 16-15.
- Step 7** Complete the [“DLP-E171 Verify Fan Operation”](#) task on page 17-55.
- Step 8** Continue with the [“NTP-E6 Install Wires to Alarm, Timing, LAN, and Craft Pin Connections”](#) procedure on page 1-12.

Stop. You have completed this procedure.

NTP-E5 Remove the Rear Cover

Purpose	This procedure removes the rear cover to provide access to the customer access panel (CAP or CAP2).
Tools/Equipment	None
Prerequisite Procedures	NTP-E2 Install the Bay Assembly, page 1-5
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

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- Step 1** Partially unscrew the retaining screws that hold the plastic cover in place.
- Step 2** Grasp the cover on each side and slide it to the left so it is free of the key holes.
- Step 3** Pull the cover away from the bay.
- Step 4** Continue with the “[NTP-E6 Install Wires to Alarm, Timing, LAN, and Craft Pin Connections](#)” procedure on page 1-12.
- Stop. You have completed this procedure.**
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NTP-E6 Install Wires to Alarm, Timing, LAN, and Craft Pin Connections

Purpose	This procedure explains how to install alarm, timing, LAN, and craft wires.
Tools/Equipment	Wire-wrap tool (suitable for #22 to #28 AWG alarm wires) #22 or #24 AWG alarm wires
Prerequisite Procedures	NTP-E4 Install the Bay Power and Ground, page 1-10
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None



Caution This equipment is suitable for intrabuilding wiring only.

- Step 1** Complete the “[DLP-E277 Install Alarm Wires on the CAP/CAP2](#)” task on page 18-95 as necessary. Alarm wires are necessary to create external alarms and controls.
- Step 2** Complete the “[DLP-E12 Install T1 \(100 Ohm\) Timing Connections on the CAP/CAP2](#)” task on page 16-16 if you are using a 100-ohm T1 building integrated timing supply (BITS) timing source.
- Step 3** Complete the “[DLP-E13 Install LAN Cables on the CAP/CAP2](#)” task on page 16-17 as needed. LAN cables (or the LAN port on the Timing and Shelf Controller [TSC] card) are necessary to create an external LAN connection.
- Step 4** Complete the “[DLP-E14 Install the TL1 Craft Interface Cable](#)” task on page 16-18 as needed. Craft cables (or the RJ-45 port on the TSC) are required to access TL1.

**Caution**

Always use the supplied ESD wristband when working with a powered ONS 15600. Plug the wristband cable into either the ESD jack located on the lower-left outside edge of the bay assembly, or the other ESD jack located at the bottom rear of the shelf.

Step 5 Complete the “[NTP-E8 Replace the Rear Cover](#)” procedure on page 1-13.

Step 6 Continue with the “[NTP-E7 Perform the Bay Installation Acceptance Test](#)” procedure on page 1-14.

Stop. You have completed this procedure.

NTP-E8 Replace the Rear Cover

Purpose	This procedure replaces the rear cover.
Tools/Equipment	Screwdriver Retaining screws
Prerequisite Procedures	None
Required/As Needed	As needed
Onsite/Remote	Onsite
Security Level	None

Step 1 Grasp the clear plastic cover on each side.

Step 2 Align the cover with the holes provided for the screws.

Step 3 Screw the retaining screws that hold the clear plastic cover in place.

Stop. You have completed this procedure.

NTP-E7 Perform the Bay Installation Acceptance Test

Purpose	This procedure performs a bay installation acceptance test.
Tools/Equipment	Voltmeter
Prerequisite Procedures	NTP-E1 Unpack and Inspect the ONS 15600 Bay Assembly, page 1-4 NTP-E2 Install the Bay Assembly, page 1-5 NTP-E3 Open and Remove the Front Door, page 1-7 NTP-E4 Install the Bay Power and Ground, page 1-10 NTP-E5 Remove the Rear Cover, page 1-12 NTP-E6 Install Wires to Alarm, Timing, LAN, and Craft Pin Connections, page 1-12
Required/As Needed	Required
Onsite/Remote	Onsite
Security Level	None

Step 1 In [Table 1-1](#), verify that each procedure was completed.

Table 1-1 ONS 15600 Bay Installation Task Summary

Description	Completed
NTP-E1 Unpack and Inspect the ONS 15600 Bay Assembly, page 1-4	
NTP-E2 Install the Bay Assembly, page 1-5	
NTP-E186 Install Additional Shelf Assemblies in the Bay (Two People), page 1-6	
NTP-E3 Open and Remove the Front Door, page 1-7	
NTP-E104 Install Cable Routing Modules and Kick Plates, page 1-9	
NTP-E4 Install the Bay Power and Ground, page 1-10	
NTP-E5 Remove the Rear Cover, page 1-12	
NTP-E6 Install Wires to Alarm, Timing, LAN, and Craft Pin Connections, page 1-12	
NTP-E8 Replace the Rear Cover, page 1-13	

Step 2 Complete the “[DLP-E15 Inspect the Bay Installation and Connections](#)” task on page 16-18.

Stop. You have completed this procedure.