NOKIA

Upgrading UltraSite EDGE BTS

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Contents

1 Statutory information

1.1 CE Marking

Standard	Description
CE 0168 ⓘ	Hereby, Nokia Corporation, declares that this Nokia UltraSite EDGE Base Station is in compliance with the essential requirements and other relevant provisions of Directive: 1999/5/EC.

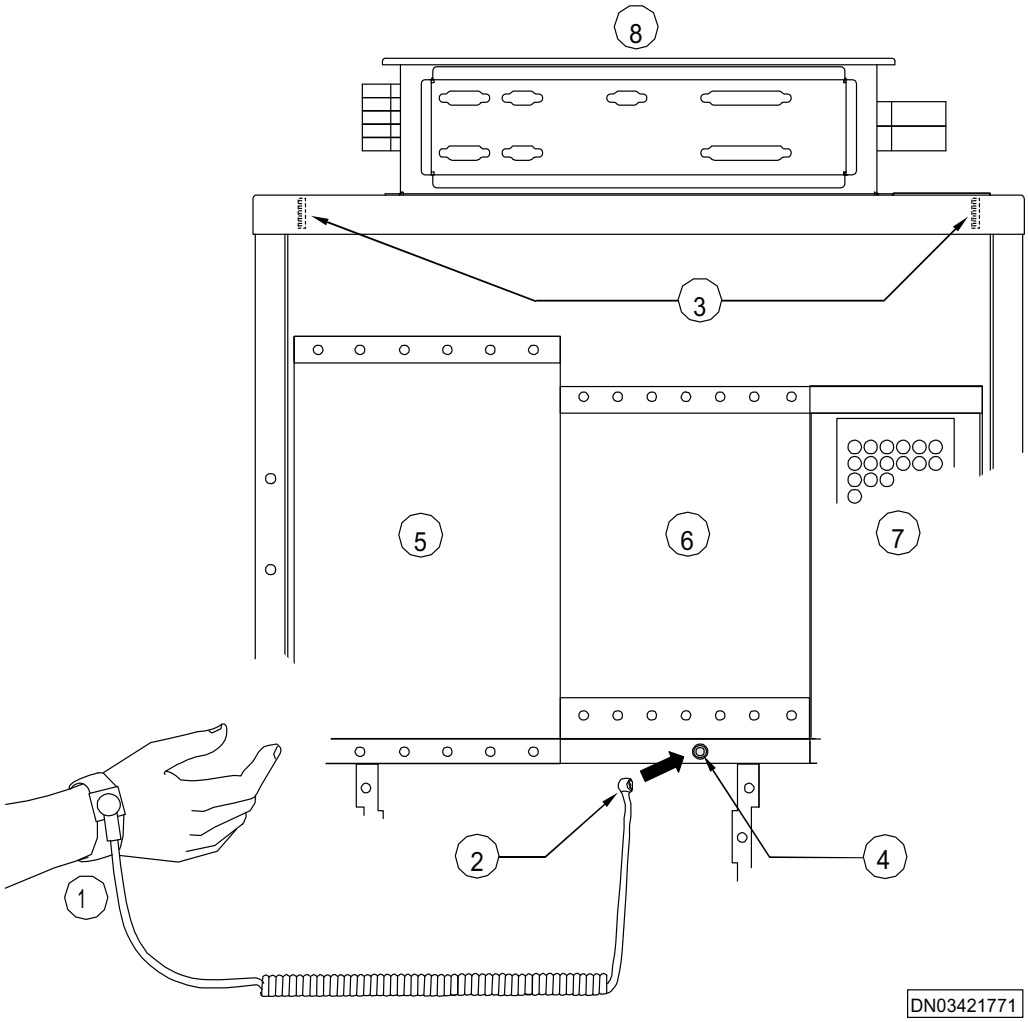
1.2 FCC Statement

Standard	Description
FCC Statement	Hereby, Nokia Corporation declares that this Nokia UltraSite EDGE Base Station is in compliance with the essential requirements and other relevant provisions of Directive: 1999/5/EC. The product is marked with the CE marking and Notified Body number according to the Directive 1999/5/EC. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. The term "IC:" before the radio certification number only signifies that Industry Canada technical specifications were met.

2 Overview of upgrading UltraSite EDGE BTS

2.1 Overview of upgrading UltraSite EDGE BTS

Before you start



1	Wrist strap
2	To ESD snap
3	Grounding stud behind front flange
4	ESD snap

Figure 1. Antistatic wrist strap connection

Summary

This section provides the instructions to upgrade from:

- GSM to GSM/EDGE
- GSM/EDGE to WCDMA

Steps

1. *If* upgrading GSM BTS to GSM/EDGE BTS

   Then

   Follow these instructions .

2. *If* upgrading GSM/EDGE BTS to WCDMA

   Then

   Follow these instructions .

2.2 Torque settings of UltraSite EDGE BTS

Nokia recommends the following torque values for various fasteners used in UltraSite EDGE BTS.

Note

Over-tightening causes stress on the connectors. For the TSxx, BB2x and BOIx units, ensure a gap of 1.0 to 3.0 mm exists between the front flange of the unit and the cabinet when tightened to 1.0 Nm (maximum).

Note

The following table provides the torque measurements that Nokia recommends for installing the GSM/EDGE BTS units. All torque values assume a lubricated bolt or fastener.

Note

These are basic torque values. Any exceptions to these values are provided in the installation procedures.

Table 1. Cabinet installation torque recommendations

Bolt/screw type	DIN	Size	Torque
Plastic connector finger screws			0.2 - 0.3 Nm (0.15 - 0.22 ft lb)
Slotted head, phillips head or Torx head screw		M3	0.7 - 1.0 Nm (0.52 - 0.74 ft lb)
Slotted head, phillips head or Torx head screw		M4	1.2 - 1.6 Nm (0.88 - 1.18 ft lb)
Slotted head, phillips head or Torx head screw		M5	2.0 - 2.6 Nm (1.47 - 1.92 ft lb)
Hexagon socket head screw	933-A2	M6	4.2 - 5.5 Nm (3.1 - 4.05 ft lb

Table 1. Cabinet installation torque recommendations (cont.)

Bolt/screw type	DIN	Size	Torque
Nut	934-A2	M6	4.2 - 5.5 Nm (3.1 - 4.05 ft lb)
Hexagon socket head screw	912-A2	M8	8.0 - 10.0 Nm (5.9 - 7.37 ft lb)
3/8 hexagon head bolt	933-A2	M10	24 Nm (17.69 ft lb)
Lifting eye bolt (not included)	580	M12	39 Nm (28.74 ft lb)
Torx socket head screw cylinder head	934-A2	M3	0.7 Nm 0.52 ft lb
Torx socket head screw cylinder head	934-A2	M4	1.2 Nm 0.89 ft lb
Torx socket head screw cylinder head	934-A2	M5	2.5Nm 1.84 ft lb

Table 2. Unit installation torque recommendations

Bolt/screw type	DIN	Size	Torque
Antenna flange mount connector 7/16 in. (4 each)	934-A2	M3	1.0 Nm 0.7 ft lb
Thumb screw	934-A2	M4	1.0 Nm 0.7 ft lb
Ground lug nut	934-A2	M5	2.0 Nm 1.5 ft lb
Ground lug nut		M8	4.0 Nm 3.0 ft lb
Battery terminal screws		Not available	6.78 Nm 5.0 ft lb

Table 2. Unit installation torque recommendations (cont.)

Bolt/screw type	DIN	Size	Torque
Antenna connector		7/16 in	25 Nm 18.5 ft lb
SMA connector		Not available	1.0 Nm 0.7 ft lb
PWSC terminals		M8	10 Nm 7.0 ft lb
DCFB Output terminals		M8	10 Nm 7.0 ft lb
DCFB Input terminals		M10	28 Nm 19.6 ft lb

Table 3. WCDMA unit installation torque recommendations

Bolt/Screw Type	Size	Torque
Antenna Flange Mount Connector (4 ea.)	M3	0.1 Nm 0.074 ft lb
Unit mounting screw	M3	0.7 Nm 0.52 ft lb
Unit mounting screw	M4	1.2 Nm 0.89 ft lb
Right angle Antenna connector	N/A	25 Nm 18.5 ft lb

3 Upgrading UltraSite GSM BTS to GSM/EDGE

3.1 Overview of upgrading UltraSite GSM BTS to GSM/EDGE

Before you start

Review the *Overview of upgrading UltraSite EDGE BTS*.

Summary

Warning

Always use the antistatic wrist strap as shown in the following figure when handling units marked with the Electrostatic Sensitive Device (ESD) sign. Units carrying the ESD sign are sensitive to electrostatic discharge!

Caution

Keep the units in their packages before installation to protect the units from humidity.

Caution

Take care when handling units due to their significant weight.

Caution

Do not use excessive force when installing units to the RFU backplane connectors.

Caution

To prevent damage to the backplane connector when removing Transceiver units, ensure the unit is pulled straight out from the backplane with no upward force.

Note

Overtightening causes stress on the connectors. For the TSxB units, make sure a gap of 1.0 to 3.0 mm exists between the front flange of the unit and the cabinet when tightened to 1.0 Nm (maximum).

Steps

1. **Remove the BTS from the network..**
2. **Remove GSM units of UltraSite EDGE BTS.**
3. **Install EDGE units to UltraSite EDGE BTS.**
4. **Commission GSM/EDGE UltraSite EDGE BTS.**

3.2 Preparing for GSM to GSM/EDGE upgrade of UltraSite EDGE BTS

Before you start

Review the *Overview of upgrading UltraSite GSM BTS to GSM/EDGE*. Pay careful attention to all warnings and cautions.

Summary

Before you can begin the upgrade to GSM/EDGE, the BTS must be removed from the network.

Steps

1. **Establish the final configuration for the BTS being upgraded.**

2. **Ensure all required units are available for the upgrade and unpacked from shipping containers.**

   See *Handling and unpacking units*.

3. **Remove the BTS from the network:**

   a. Contact the Operational Maintenance staff to reroute the traffic from the BTS being upgraded.

   b. After confirming the traffic reroute, block the BTS from the BSC.

4. **Power down the BTS by switching the power supplies OFF.**

5. **Switch Mains Breakers to OFF.**

Warning

To prevent electrical shock, verify that power has been removed from the BTS input cables with a voltage measurement device.

6. **Identify the existing units that require replacement for the new configuration.**

3.3 Delivery content of UltraSite EDGE BTS GSM to GSM/EDGE upgrade kit

Part	Quantity	Check
BTS software, version CX3.3 or later	1	
Transceiver (TSxx) unit	1	

Part	Quantity	Check
Transceiver Baseband (BB2x) unit	1	

The BTS cabinet, backplane and other units do not change.

3.4 Removing GSM units of UltraSite EDGE BTS

Before you start

Review the *Overview of upgrading UltraSite GSM BTS to GSM/EDGE*. Pay careful attention to all warnings and cautions.

Summary

Depending on the desired configuration, additional units are removed to allow the desired configuration. During removal of existing units from the BTS, only perform the physical steps for removal of existing units as the units are not being replaced during operation of the BTS and different units are being installed later in this proceedure.

Steps

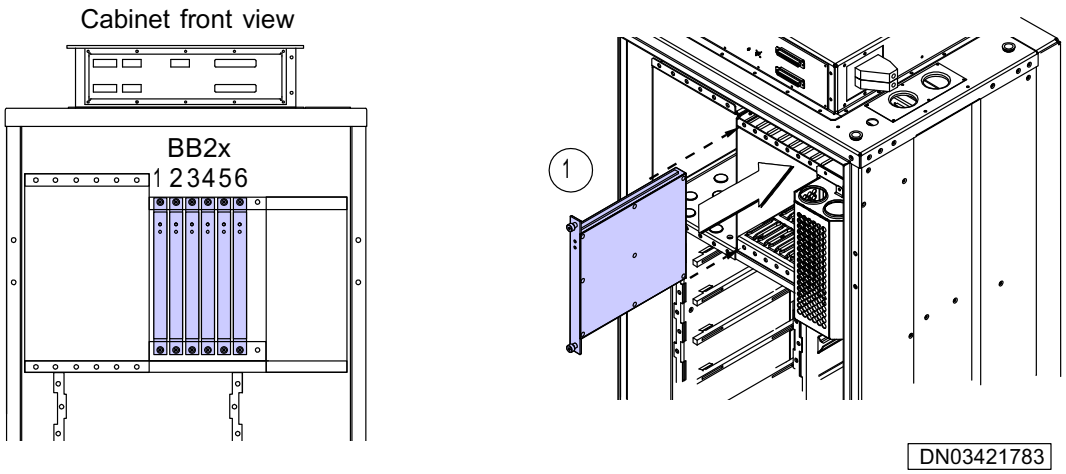
1. **Remove BB2x units being replaced.**
2. **Disconnect RF cables from TSxA units to be removed. Note their existing connections for reconnection.**
3. **Remove TSxA units being replaced.**
4. **Remove any additional units as required for the desired configuration.**
5. **Package removed units to prevent damage and allow for future use.**

3.5 Removing a Transceiver Baseband (BB2x) unit from UltraSite EDGE BTS

Before you start

Refer to the *Overview of removing units from UltraSite EDGE BTS*. Pay careful attention to all Warnings and Cautions.

Summary



1	BB2x

Figure 2. BB2x unit installation

Steps

1. Block the TRXs associated with the BB2x

Block the TRXs locally with Nokia BTS Manager or request BCF lock from the BSC.

Note

Use Nokia BTSManager to read the BB2x TSxx cross-connection in the BOIx to determine the TRXs you need to block.

2. Loosen the upper and lower unit retaining screws.

3. Remove the faulty BB2x unit.

3.6 Removing a Transceiver (TSxx) unit from UltraSite EDGE BTS

Before you start

Refer to the *Overview of removing units from UltraSite EDGE BTS*. Pay careful attention to all Warnings and Cautions.

Summary

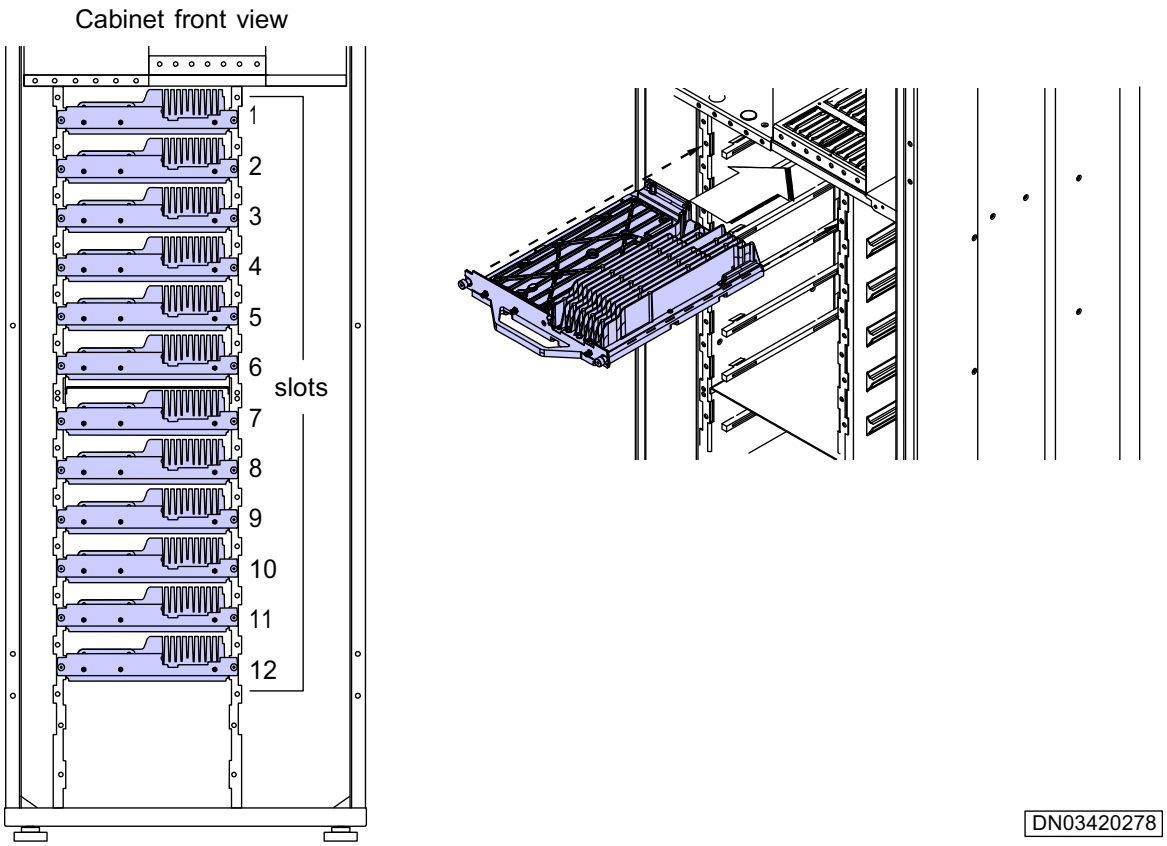


Figure 3. TCxx unit removal

Steps

1. Block the TRX associated with the TSxx unit.

Use Nokia BTS Manager or request TRX lock from the BSC.

2. **Note the TSxx unit cable configuration.**

3. **Disconnect the TSxx unit cables.**

4. **Loosen the unit retaining screws with a T20 Torx driver.**

5. **Remove the TSxx unit.**

3.7 Installing EDGE units of UltraSite EDGE BTS

Before you start

Review the *Overview of upgrading UltraSite GSM BTS to GSM/EDGE*. Pay careful attention to warnings and cautions.

Summary

GSM/EDGE-capable TSxB and BB2x units for Nokia UltraSite EDGE BTS are compatible with GSM TSxxs and BB2xs and fit into the same slots in the BTS cabinet. In addition to providing EDGE services, GSM/EDGE TSxB and BB2E units are backward compatible with legacy GSM hardware.

Steps

1. **Install the BB2x unit.**

2. **Install the TSxB units.**

3. **Install any additional units required for the desired configuration in accordance with Install any additional units required for the desired configuration.**

4. **Replace any units necessary for the desired configuration in accordance with the appropriate procedure.**

5. **Install, route and connect RF cabling for the new configuration.**

3.8 Installing a Transceiver (TSxx) unit in UltraSite EDGE BTS

Before you start

Review the *Overview of installing units.* Pay careful attention to all warnings and cautions.

Summary

Caution

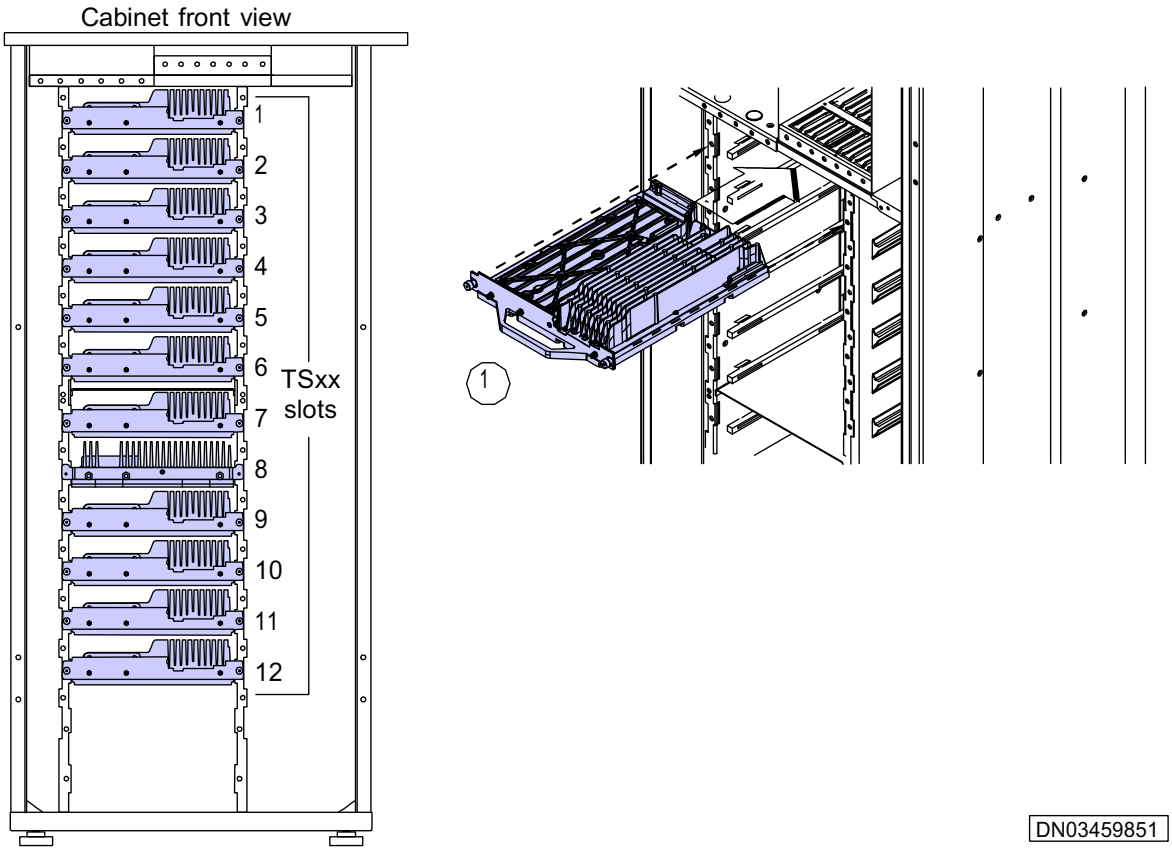
Do not use force to insert the TSxx unit. The connector pins are fragile and may be damaged.

Caution

To prevent damage to the backplane connector when removing Transceiver units, ensure the unit is pulled straight out from the backplane with no upward force.

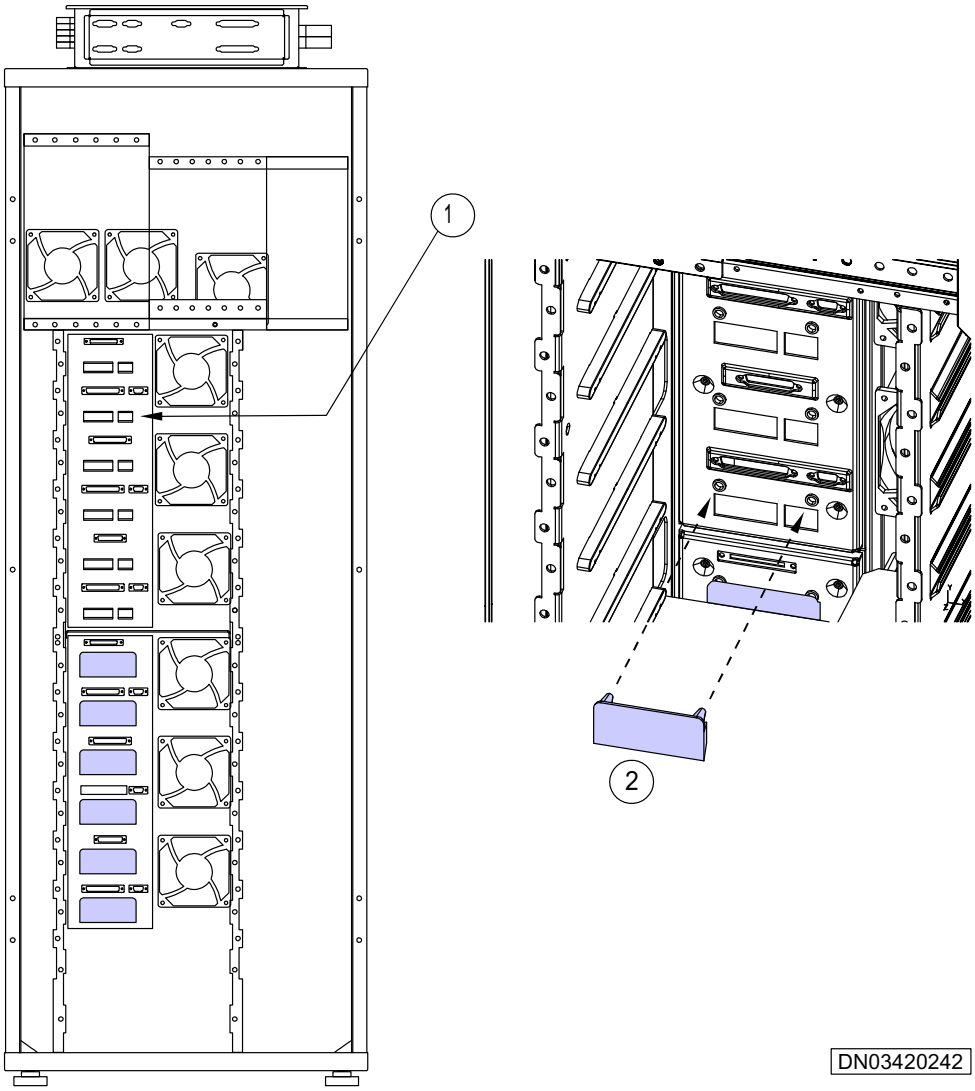
Note

A connector cap is only necessary for outdoor installations.



1	TSxx

Figure 4. TSxx unit installation



1	TSxx connector (12 places per cabinet)
2	TSxx connector cap

Figure 5. TSxx connector cap installation

The Transceiver (TSxx) unit consists of one transmitter, one main receiver, and one diversity receiver. The slots in the middle of the cabinet can hold up to 12 TSxx units from top to bottom.

Steps

1. **Insert the TSxx unit into a free slot.**
2. **Hand tighten the retaining screws.**

   See *Torque settings.*
3. **Repeat steps 1 and 2 for each additional TSxx unit.**
4. *If* An outdoor kit (OAKx) is used

   Then

   Place one connector cap on each unused connector slot.

3.9 Installing a Transceiver Baseband (BB2x) unit in UltraSite EDGE BTS

Purpose

The BB2x unit consists of two independent baseband modules. Each module functions with its respective TSxx unit. The cabinet provides slots from left to right for up to six BB2x units.

Before you start

Caution

This unit is sensitive to Electro Static Discharge (ESD). Proper ESD handling procedures must be used when installing this unit.

Caution

Ensure no BB2x unit is installed in the far right slot of the common subrack area. This position is only for installation of a BOIx unit.

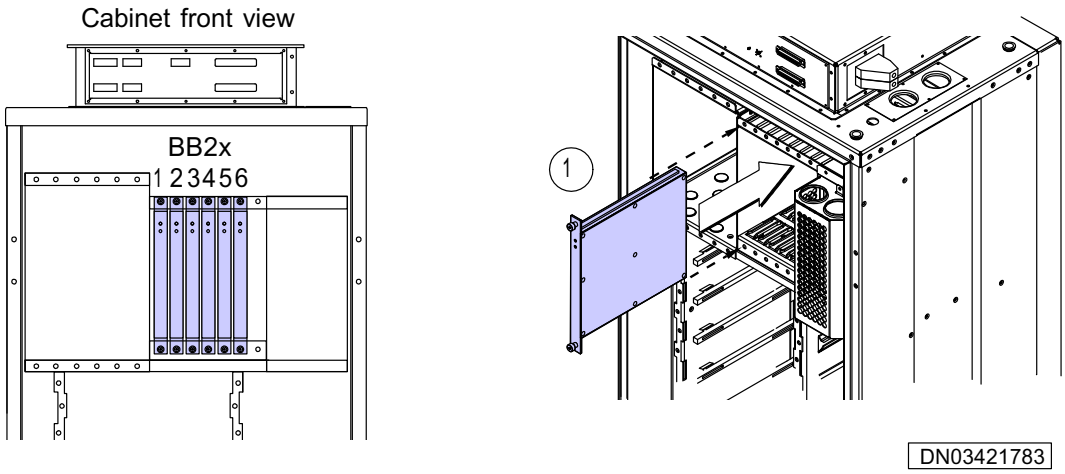
Note

BB2x units can be in any position when flexible cross-connects are used. Installation must be left to right in sequential order when flexible cross-connects are not utilised.

Note

A dummy unit is required for each unused BB2x slot in an OAKx.

Summary



1	BB2x

Figure 6. BB2x unit installation

Steps

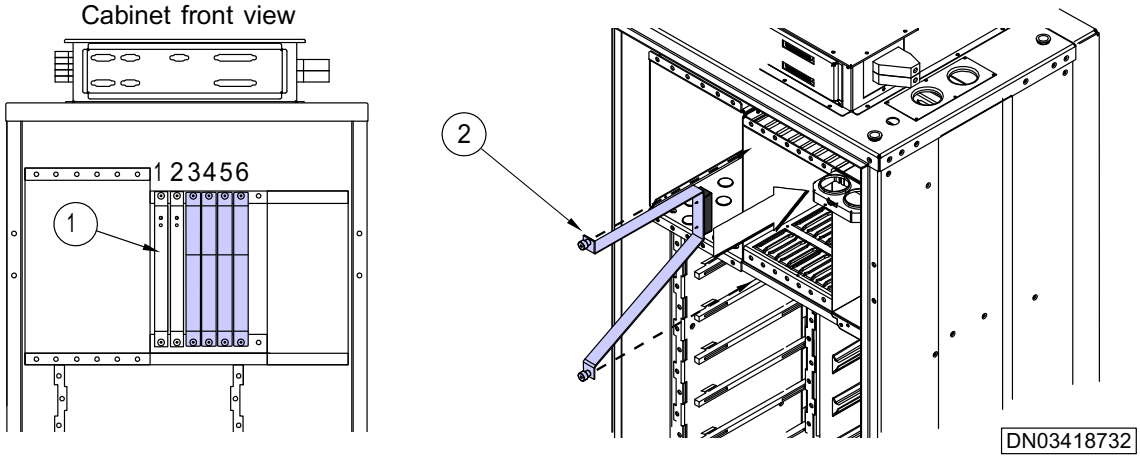
1. **Remove the BB2x unit from its protective package and check for visible damage.**

2. **Insert the BB2x unit into an unused slot.**

3. Tighten the retaining screws to 1.0 Nm (0.74 ft lb) with a T20 Torx driver.

4. Repeat steps 1 through 3 for each additional BB2x unit.

5. Install dummy BB2x units, if required



1	BB2x
2	Dummy BB2X unit

Figure 7. Dummy BB2x unit installation in an OAKx

a. Unpack the dummy BB2x unit from its protective package and check for visible damage.
b. Insert the dummy unit into the unused slot.
c. Tighten the unit retaining screws with a T20 Torx driver.
d. Repeat steps a through c for additional unused slots.

6. Recycle the packing material.

4 Upgrading UltraSite EDGE BTS with WCDMA upgrade

4.1 Overview of upgrading UltraSite EDGE BTS with WCDMA upgrade

Before you start

Review the *Overview of upgrading UltraSite EDGE BTS*.

Summary

WCDMA Upgrade Kit consists of racks with incorporated backplanes that are installed to UltraSite EDGE BTS cabinet to fit WCDMA plug-in units, cables and other WCDMA equipment. After WCDMA upgrade, the UltraSite EDGE BTS includes WCDMA functionality to support smooth migration from GSM/EDGE to WCDMA.

Steps

1. *If* you are upgrading to WCDMA at a new site,

   Then

   Follow these directions.

2. *If* you are upgrading to WCDMA at an existing BTS site,

   Then

   Follow these directions.

4.2 Delivery content of UltraSite EDGE BTS WCDMA upgrade transportation package

Table 4. Delivery content of UltraSite EDGE BTS WCDMA upgrade transportation package

Part	Quantity	Check
New WCDMA Upgrade Kit antenna box front cover	1	
WCDMA antenna cables	3	
BB rack IP shield	1	
RF rack IP shield	1	
MHA cables	6	
Chain Clock cables	2	
Heater control cable (optional for Outdoor cabinet)	1	
BB rack	1	
WAF rack	1	
RF rack	1	
WTCA Fan Module Bottom Plate	1	
WTCA Fan Module	1	
WCDMA Power Supply Unit (WPS)	1	
WCDMA upgrade kit door (Outdoor only)	1	

4.3 Preparation for installation of WCDMA upgrade in UltraSite EDGE BTS

4.3.1 Preparing UltraSite EDGE BTS for WCDMA Upgrade

Before you start

Review the *Overview of upgrading UltraSite EDGE BTS with WCDMA*.

Summary

Warning

The OAKx door is heavy. You will need a minimum of two installatoin personnel to remove the OAKx door.

Warning

Do not disconnect the antenna cables from the antenna box. Electrical hazards exist. The BTS power is on.

Warning

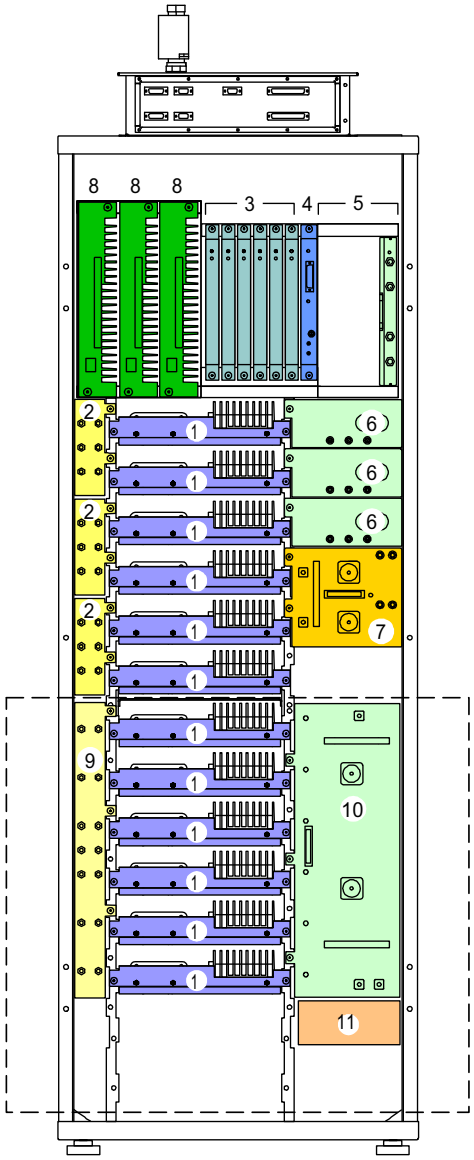
Permanently wire Nokia UltraSite EDGE BTS to a disconnect device, such as a circuit breaker.

Warning

Disconnect Nokia UltraSite EDGE BTS from the mains power network with a dedicated switch. Turning OFF Nokia UltraSite EDGE BTS using the BTS power supply (PWSx) switch leaves it in STANDBY mode.

Warning

Follow national regulations when working with power supply and power cables.



KEY:
1 Transceiver unit (TSxx)
2 2-way Receiver Multicoupler unit (M2xx)
3 Transceiver Baseband unit (BB2x)
4 Base Operations and Interfaces unit (BOIx)
5 Transmission unit (VXxx)
6 Wideband Combiner unit (WCxx)
7 Dual Variable Gain Duplex Filter unit (DVxx)
8 DC/DC Power Supply unit (PWSB)
9 6-way Receiver Multicoupler unit (M6xx)
10 Remote Tune Combiner unit (RTxx)
11 RF Filter Fan

The lower compartment of the BTS with the GSM/EDGE equipment to be removed before WCDMA Upgrade Kit installation

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Figure 8. Nokia UltraSite EDGE BTS cabinet showing the lower compartment with the GSM/EDGE units to be removed

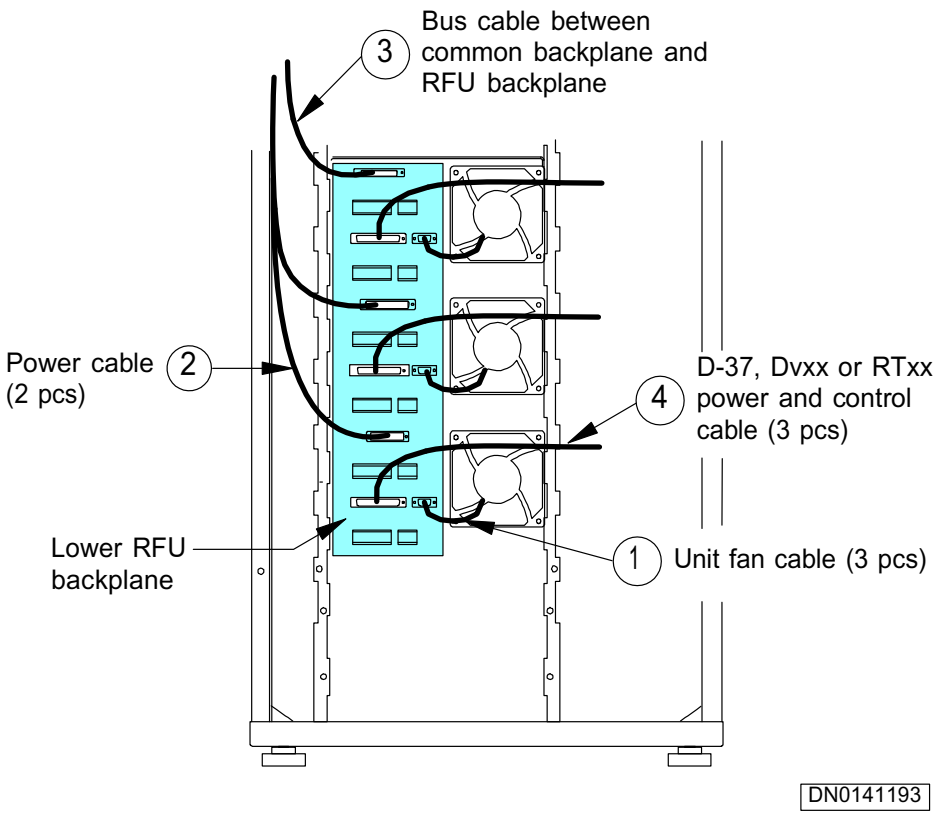

Figure 9. Disconnecting cables from the lower RFU backplane

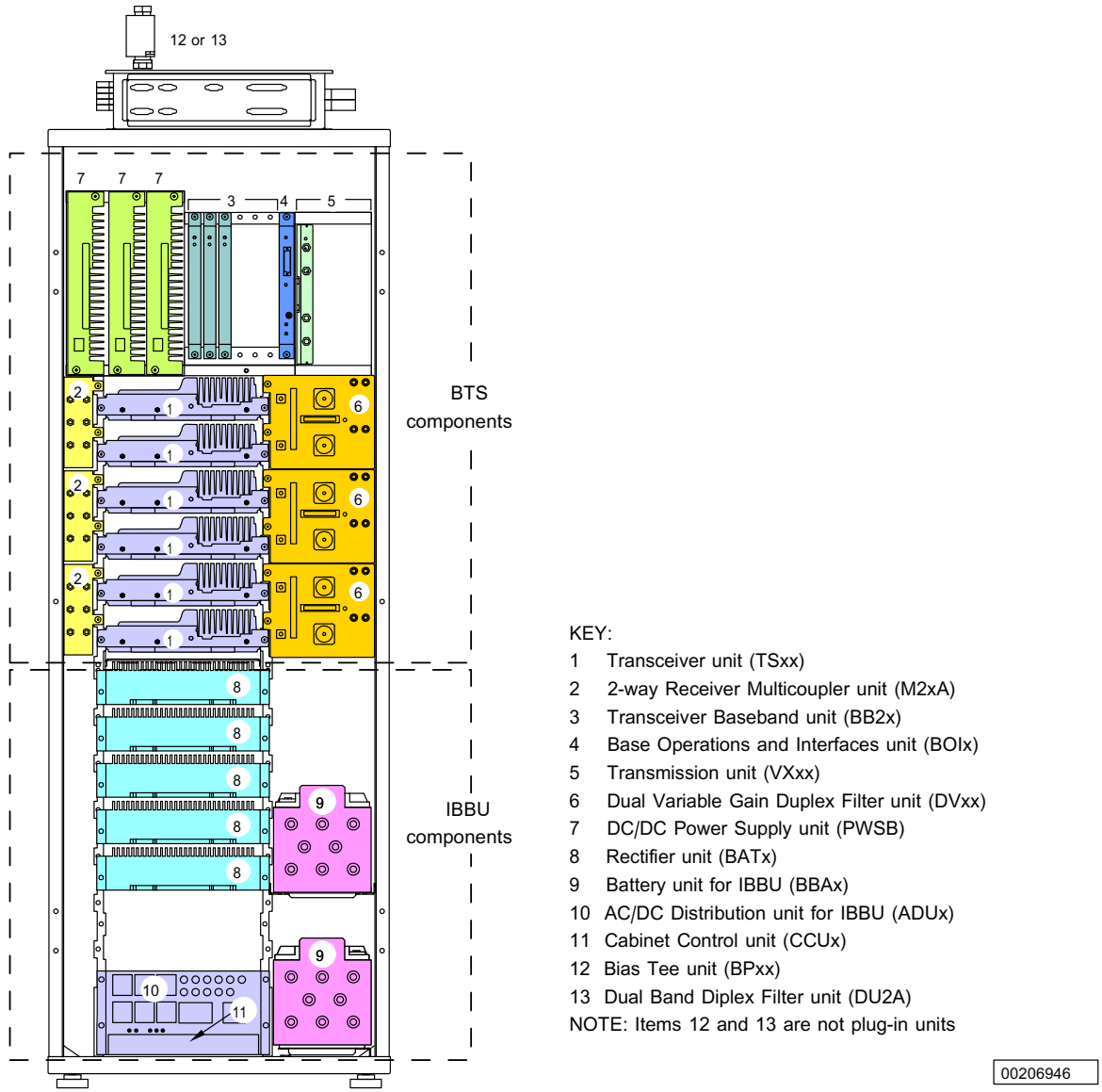

Figure 10. The lower compartment of the BTS cabinet with the IBBU components to be removed

Steps

1. *If* you are upgrading an indoor cabinet with WCDMA,

   Then

remove IAKx roof and door.

a. *Remove the IAKx roof.*
b. *Remove the IAKx door.*

2. *If* you are upgrading an outdoor cabinet with WCDMA,

Then

remove the OAKx door and open the roof.

a. *Remove the heater (HETA) unit*.
b. Store the HETA temporarily. You need the HETA later in the new WCDMA Upgrade Kit door for the outdoor cabinet.
c. *Remove the OAKx door.*
d. Open the OAKx roof and secure it with roof stay.

3. Remove GSM/EDGE equipment from the lower compartment of the BTS cabinet.

For information about removing GSM/EDGE units, see *Overview of removing GSM/EDGE units from UltraSite EDGE BTS.*

a. Connect to the BTS with a laptop using Nokia BTS Manager.
b. Establish a Nokia BTS Manager session to the BTS.
c. Open BTS HW Configurator.
d. At the BSC or NMS/2000, reroute the traffic from the TRXx in the lower compartment of the BTS to the TRXs in the upper compartment of the BTS or to the neighbouring BTSs.
e. At the BSC or NMS/2000, *lock the TRXs in the lower compartment of the BTS.*
f. Reconfigure the BTS with BTS HW Configurator so that the TRXs in the lower compartment of the BTS are no longer defined in the BTS configuration.
g. *Commission the upper part of the BTS with a new GSM/EDGE configuration*..
h. Disconnect the antenna cables from the Remote Tune Combiner (RTxx) or Dual Variable Gain Duplex (DVxx) units in the lower compartment in the cabinet. Do not disconnect the antenna cables from the antenna box.
i. Disconnect and remove all the unit cables connected to the GSM/EDGE units in the lower compartment of the BTS cabinet.
j. Store the cables properly. They can be reused in other Nokia UltraSite EDGE BTSs.
k. *Remove the GSM/EDGE units from the lower compartment of the BTS.*

Note

Do not remove the unit fans located in the cabinet core.

l. Loosen the RF Filter Fan mounting screws. Do not remove the screws; you will need them in place for installing the BB Rack IP Shield for the outdoor cabinet.

m. Remove the RF Filter Fan from the lower compartment of the BTS.

n. *Remove the BB2x units* that were cross-connected with the removed TSxx units and are now redundant (slots 4-6 in the common rack).

Note

Check the BTS configuration wuth BTS HW Configurator to see which BB2x units are now redundant.

o. Install dummy panels to the slots of the removed BB2x units.

p. Store the units and the RF Filter Fan properly. They can be used as spare parts in other Nokia UltraSite EDGE BTSs.

4. Switch the BTS power off.

a. At the BSC or NMS/2000, reroute the traffic from the BTS to be upgraded to the neighbouring BTSs.

b. At the BSC or NMS/2000, lock the BCF.

c. Switch off the power supply from Nokia UltraSite Support (optional).

d. On the BTS site, switch BTS power off from the PWSx unit switches.

e. Disconnect the BTS from the mains power network with a dedicated switch.

f. Remove the main fuse for the BTS from the fuse box.

5. Remove the lower RFU backplane.

a. Disconnect the unit fan cables connected to the lower RFU backplane.

Note

Do not remove the unit fans located in the cabinet core.

b. Disconnect power cables (2) coming form the voltage distribution bar.
c. Attach caps over the power cables.
d. Bend the cables through the cable entry so that they will not get in the way when installing the WCDMA Upgrade Kit.
e. Disconnect the bus cable (3) between the lower RFU backplane and common backplane from the RFU backplane.
f. Attach a cap over the bus cable.
g. Disconnect the DVxx or RTxx power and control cables (4) from the X5, X14, or X23 connectors on the lower RFU backplane and attach caps over hte cable connectors.
h. Bend the cables behind the backplane so that they will not get in the way when instaling the WCDMA Upgrade Kit.
i. Unscrew the screws in the lower RFU backplane cover plate and remove the cover plate.
j. Unscrew the screws in the backplane and remove the backplane.

6. Remove the Internal Battery Backup (IBBU) components.

Note

Before removing the IBBU, make sure that the Nokia Ultrasite Support cabinet is installed in the BTS site and connected to the BTS. Refer to the Nokia UltraSite EDGE Support Product Documentation.

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a. Switch the BTS power OFF.
b. *Remove the IBBU equipment from the lower compartment of the cabinet.*

4.3.2 Removing the door from UltraSite EDGE BTS indoor cabinet

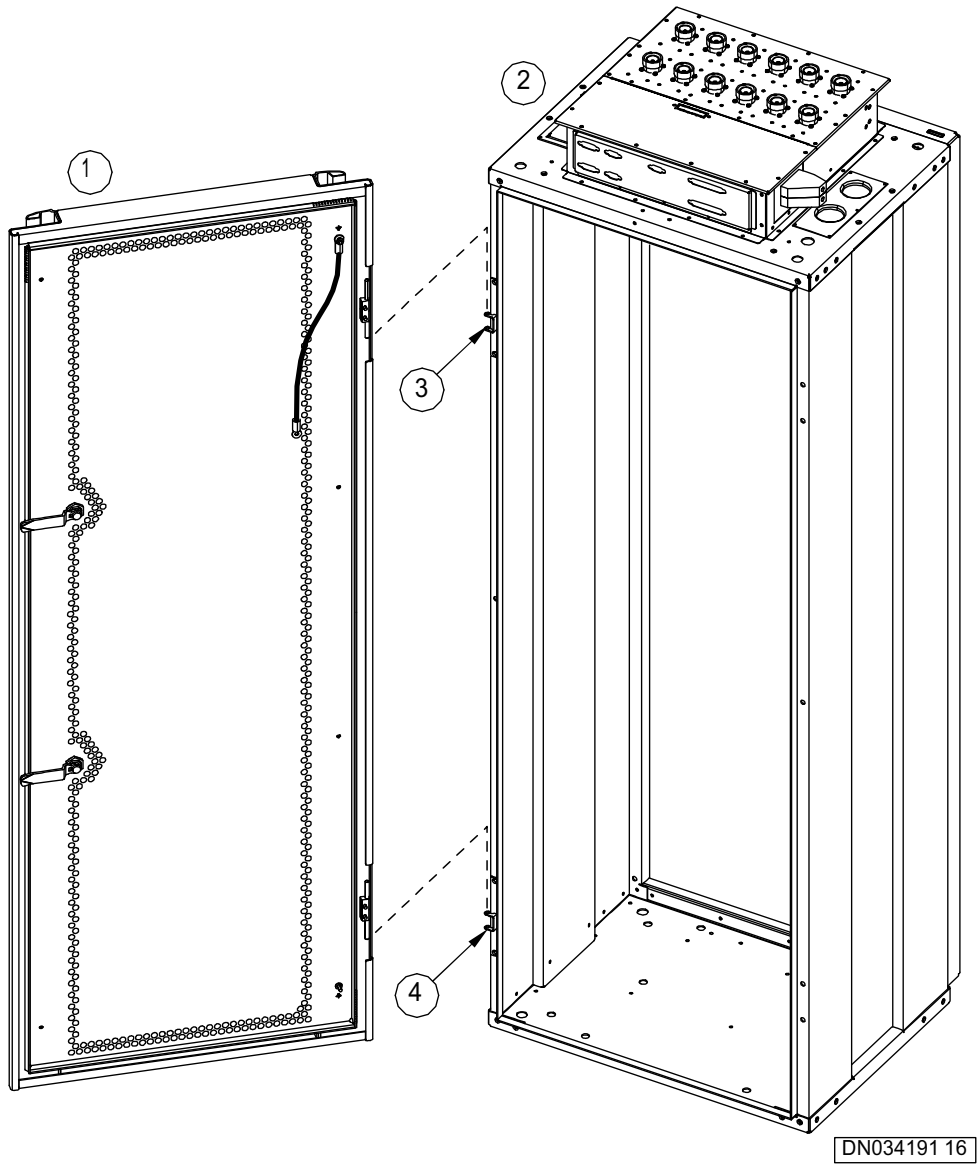
Before you start

Review the *Overview of removing core mechanics from UltraSite EDGE BTS indoor cabinet.*

Summary

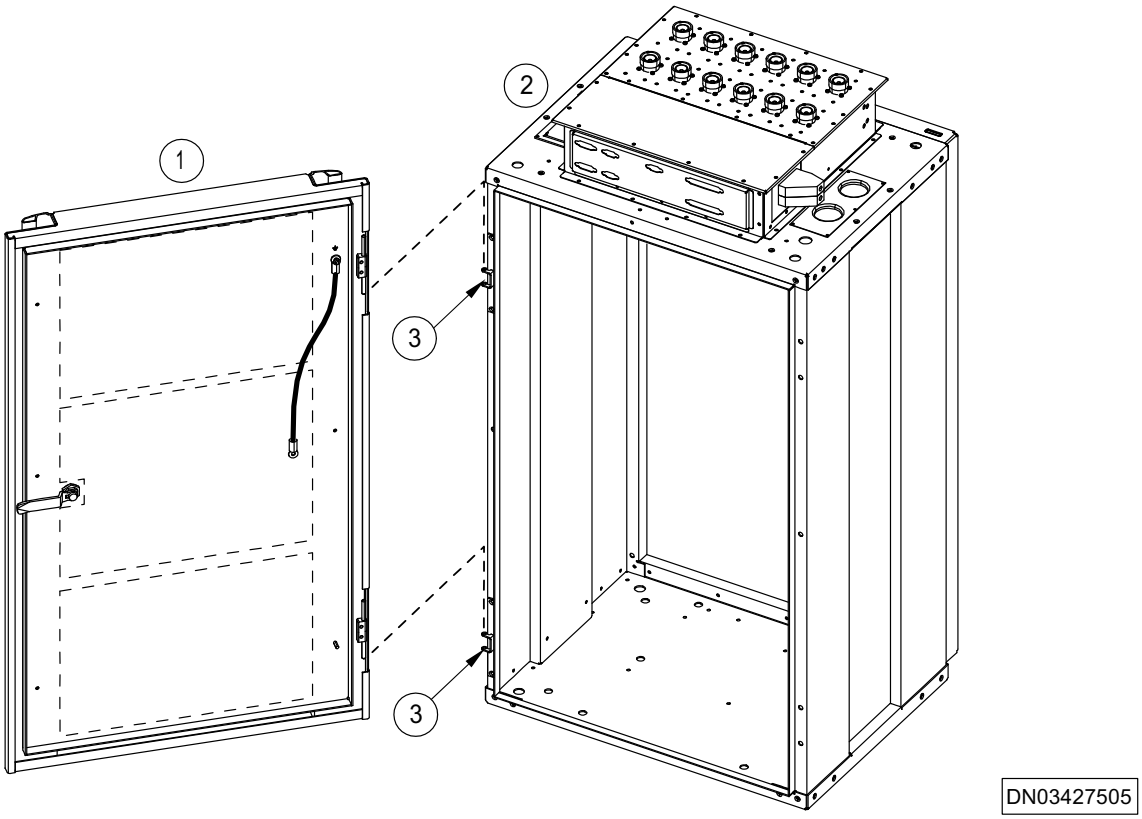
Warning

The OAKx door is heavy. You will need a minimum of two installation personnel to remove the OAKx door.



1Cabinet door2Cabinet core3Hinge4Hinge

Figure 11. Removing the IAKA door



1	Cabinet door
2	Cabinet core
3	Hinge

Figure 12. Removing the IAKC door

Steps

1. Open the door to a 90° angle.

2. Lift the door and disengage the hinge pins in the sockets on the front of the cabinet core.

Tip

Disengage the door from the hinges with the door open at a 90° angle.

4.3.3 Removing the roof from UltraSite EDGE BTS indoor cabinet

Before you start

Review the *Overview of removing core mechanics from UltraSite EDGE BTS indoor cabinet.*

Summary

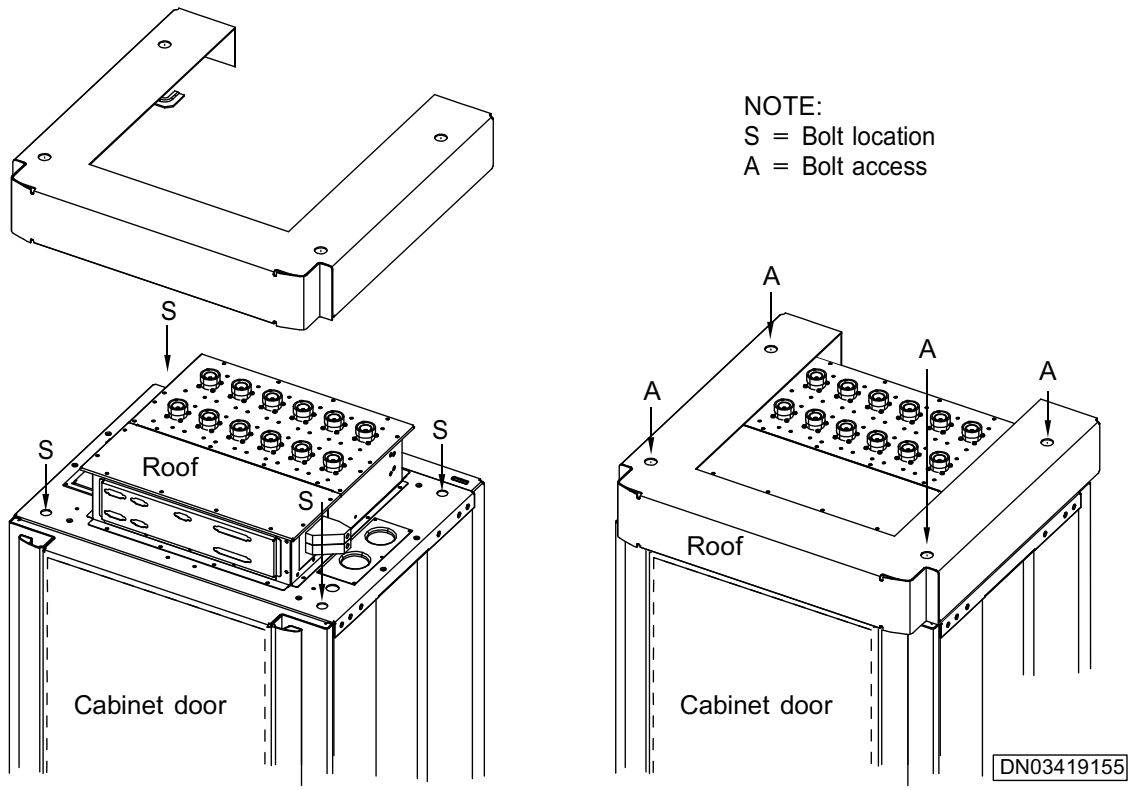


Figure 13. Removing the IAKA roof from the cabinet

Steps

1. **Loosen the four M12 bolts on top of the cabinet core.**
2. **Slide the roof slots off the four M12 bolts installed in the cabinet.**
3. **Remove the four M12 bolts from the roof.**
4. **Slide the roof up and remove the roof.**

4.3.4 Removing a GSM/EDGE heater (HETA) unit from UltraSite EDGE BTS

Before you start

Review the *Overview of removing cabinet core units from UltraSite EDGE BTS.* Pay careful attention to all warnings and cautions.

Summary

Warning

Do not open a faulty HETA unit. Return HETA unit to Nokia Service.

Note

If you are installing the HETA unit, install the AC filter unit in addition to any DC filter unit. The AC filter unit does not replace the DC filter unit.

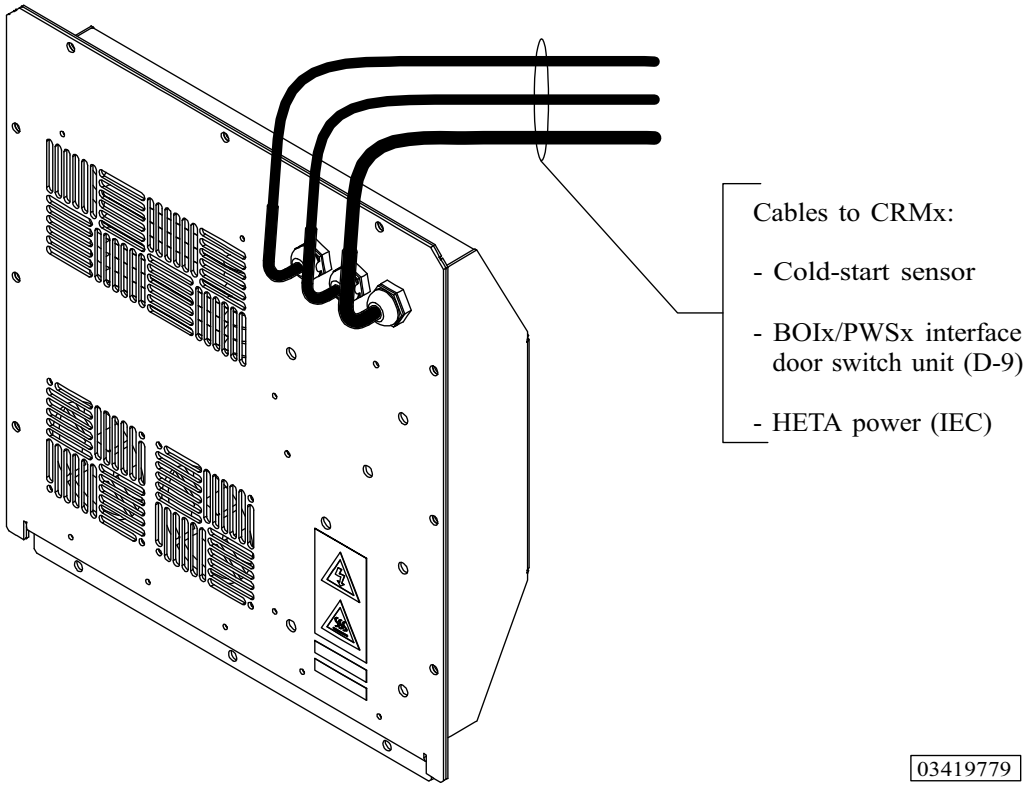
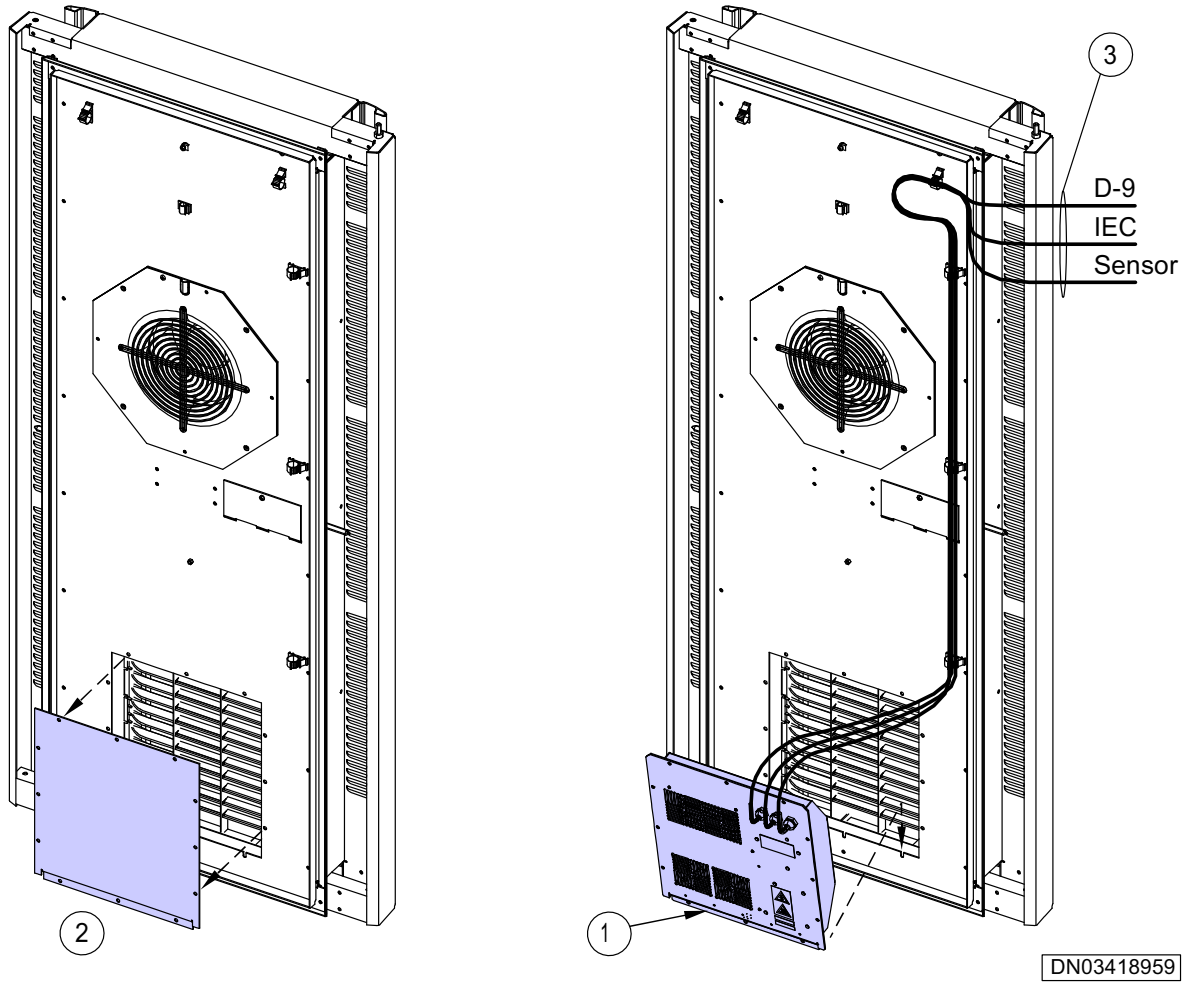
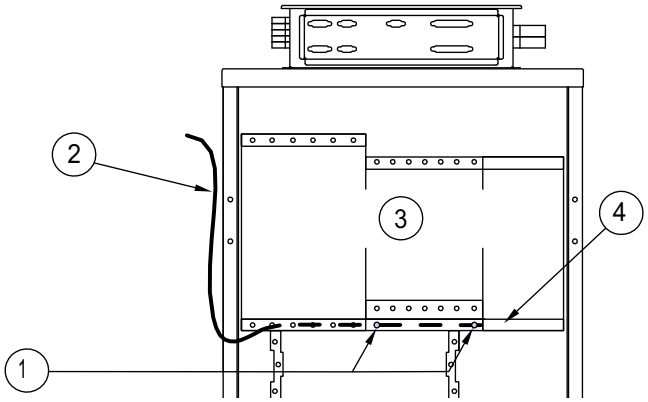


Figure 14. HETA unit cables



1	HETA unit
2	Cover (when HETA unit not used)
3	Wiring to HETA power and control

Figure 15. HETA mounted in OKAx door



1	Cold-start sensor cable from door mounted HETA unit
2	Cold-start sensor cable from door mounted HETA unit
3	Upper rack
4	Front flange

Figure 16. Sensor cable installation

Steps

1. **Disconnect the HETA signaling interface from the door switch box.**
2. **Remove the cold-start temperature sensor cable from the cabinet.**
3. **Disconnect the AC power cable for the HETA.**
4. **Cut any cable ties and remove the cables from the support clips.**
5. **Unscrew the 12 T25 mounting screws.**
6. **Remove the HETA unit.**

4.3.5 Removing a door from UltraSite EDGE BTS outdoor cabinet

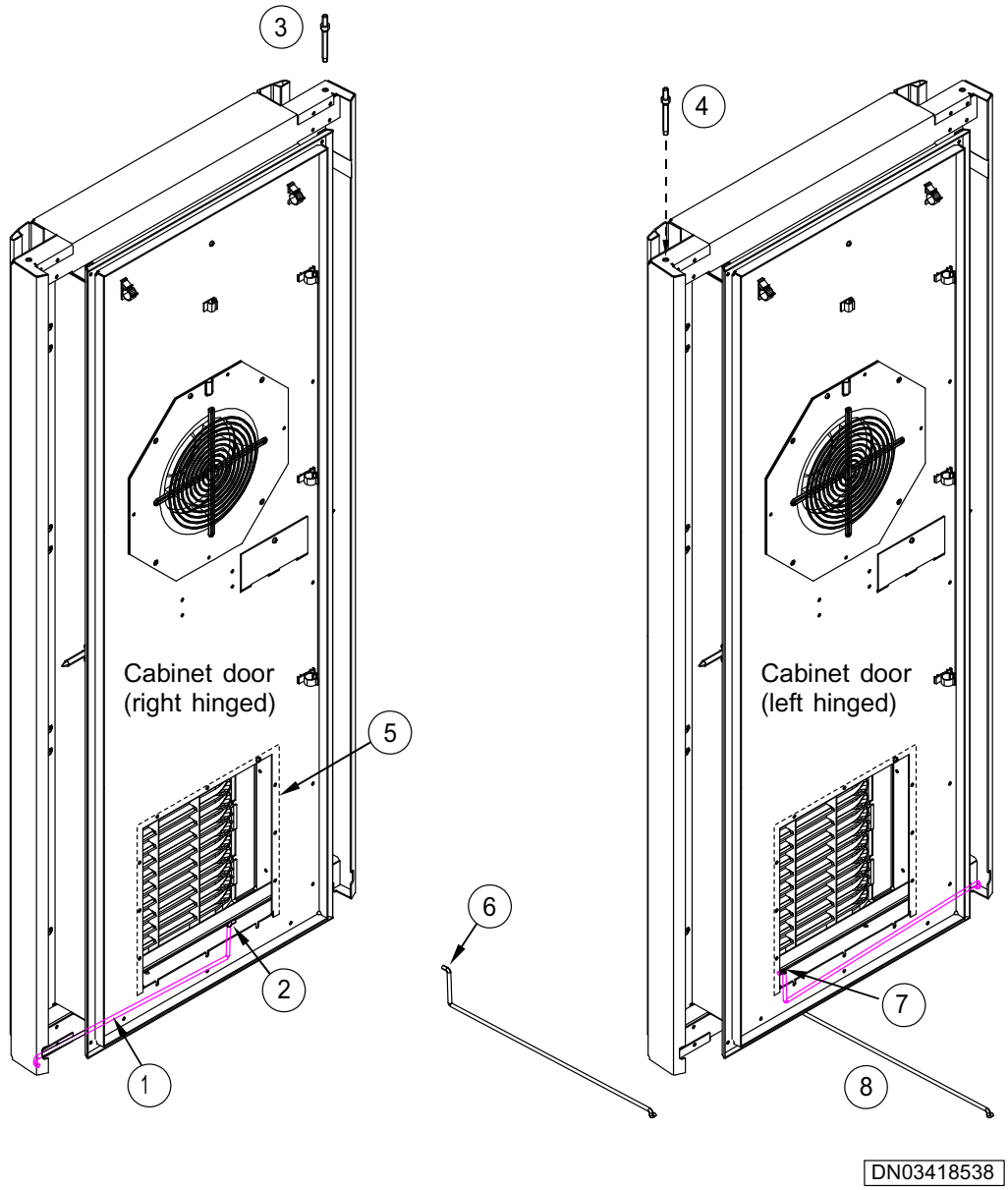
Before you start

Review the *Overview of removing core mechanics from UltraSite EDGE BTS outdoor cabinet.*

Summary

Note

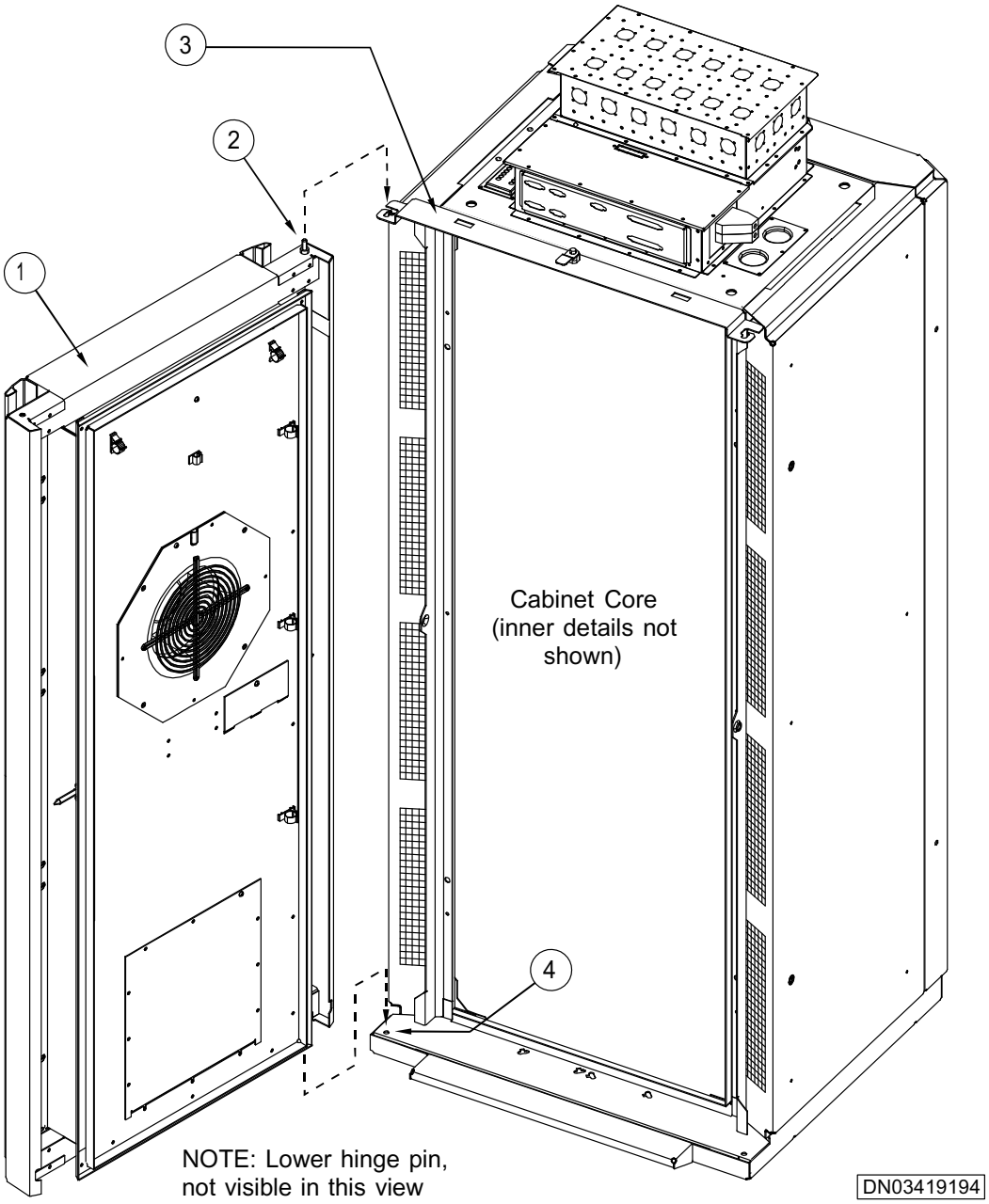
The OAKA door weighs 35 kg (77 lb). A minimum of two installers are required to remove the door.



1	Door stay retracted into cabinet
2	Attachment point
3	Remove upper hinge pin (lower hinge pin identical)

4	Re-install upper hinge pin (lower hinge pin identical)
5	Cover panel removed to show door-stay attachment points
6	Attachment end of door stay
7	Attachment point
8	Re-install door stay

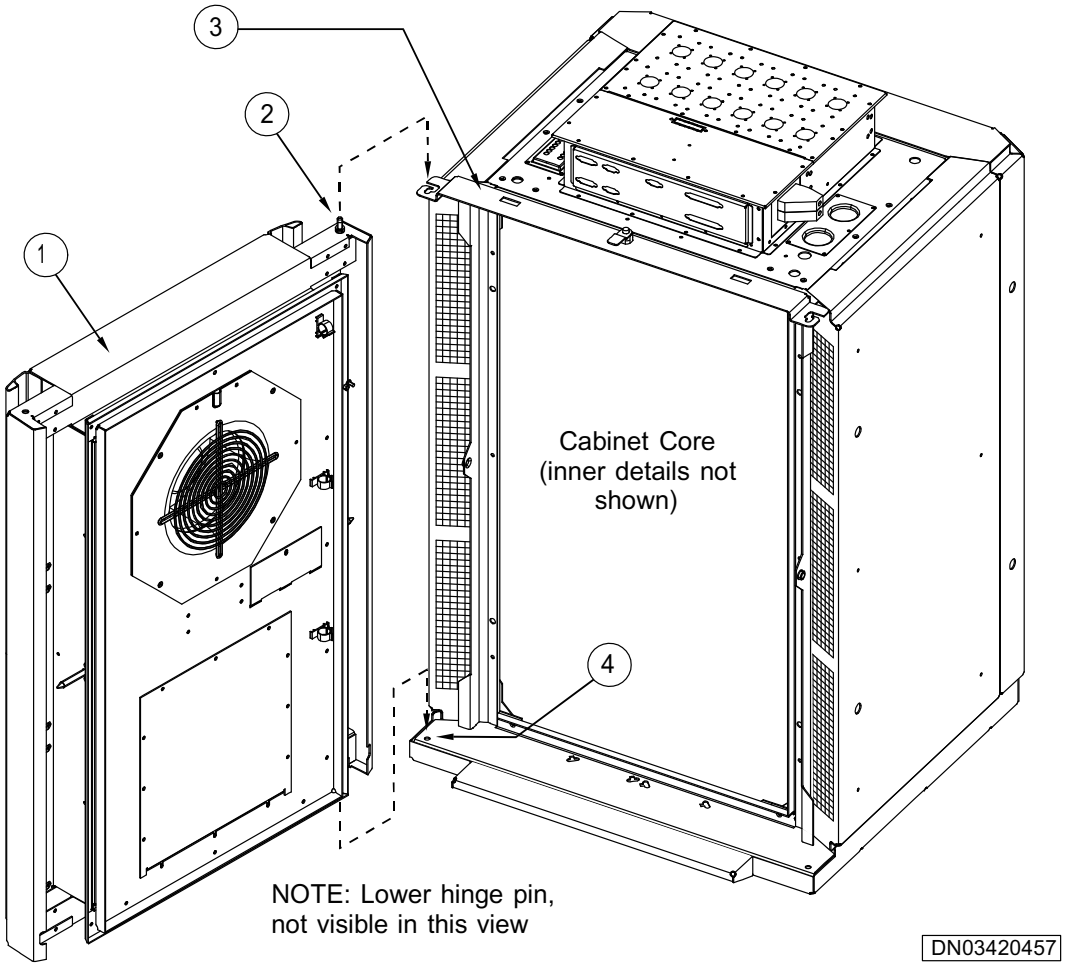
Figure 17. Configuration of OAKA door hinge pins and door stay



1	Cabinet door
2	Upper hinge pin (lower hinge pin identical)
3	Door frame

4	Hole for lower hinge pin

Figure 18. Removing the OAKA door from the cabinet



1	Cabinet door
2	Upper hinge pin (lower hinge pin identical)
3	Door frame
4	Hole for lower hinge pin

Figure 19. Removing the OAKC door from the cabinet

Steps

1. **Locate the upper and lower hinge pins (upper and lower) and door rod on the door.**

Note

Hinge pins can be installed on the right or left side of the door.

---

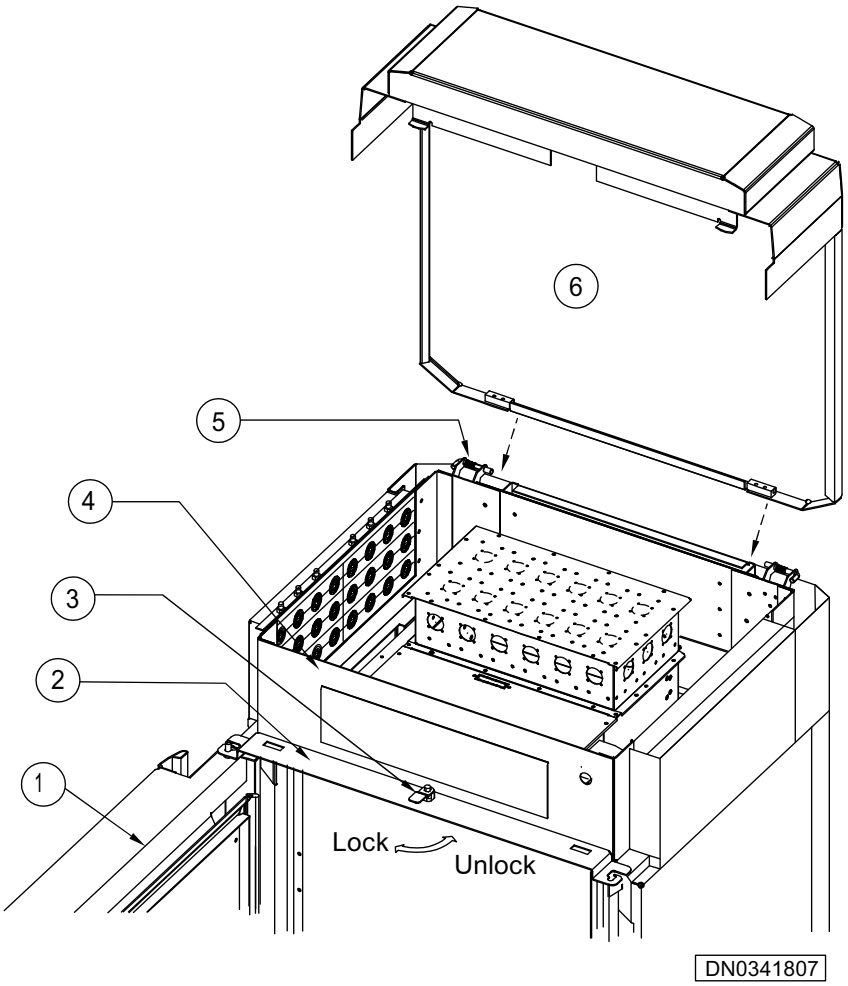
2. **Open the cabinet door.**
3. **Remove the door stay from the bottom of the door.**
4. **Lift and hold the open door up to reduce the tension on the upper and lower hinges.**
5. **With a hammer and long-handle screwdriver, tap out lower hinge pin from the inside.**
6. **Continue to lift the door and slide the lower door hinge pin out of the lower hinge hole in the door frame.**
7. **With a hammer and long-handle screwdriver, tap out the upper hinge pin from the inside.**
8. **Continue to lift and hold the door while you tap out the upper hinge pin from the inside.**
9. **Disengage the upper hinge pin of the door in the slot at the top of the door frame.**
10. **Carefully lower the door until it rests on a flat surface.**

4.3.6 Removing a roof from the roof support of UltraSite EDGE BTS outdoor cabinet

Before you start

Review the *Overview of removing core mechanics from Ultrasite EDGE BTS outdoor cabinet.*

Summary



1	Cabinet door
2	Door frame

3	Roof latch
4	Roof support assembly
5	Roof hinge pin, spring-loaded (two places)
6	Roof

Figure 20. Removing the roof from the roof support assembly

Steps

1. **Unlock the cabinet roof by turning the roof latch on the door frame to the right.**
2. **Detach the roof from the roof support assembly at the spring-loaded hinge pins.**

4.3.7 Cutting open the ventilation hole for the UltraSite EDGE BTS with WCDMA upgrade

Before you start

Review the *Overview of installing UltraSite EDGE BTS WCDMA units.*

Summary

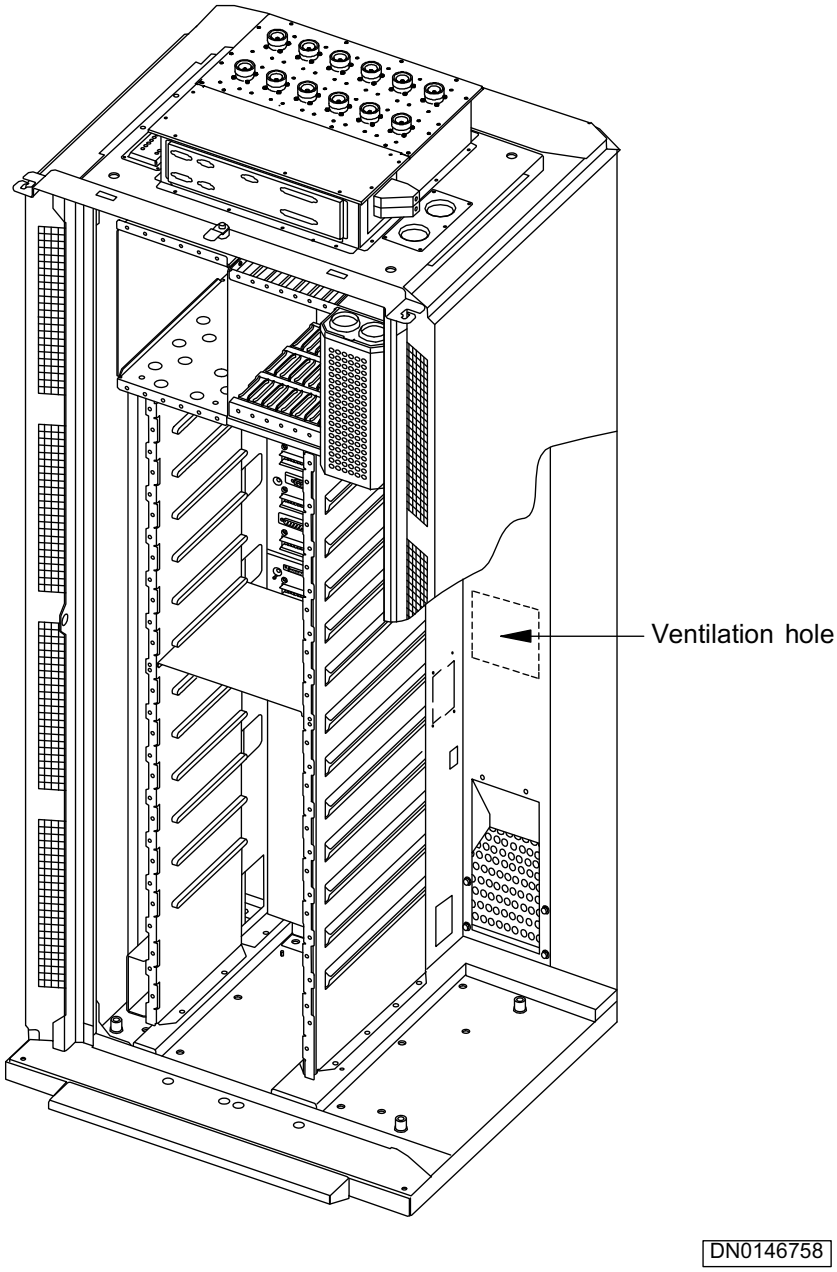


Figure 21. Location of the ventilation hole (perforated)

Steps

1. Locate the perforated area on the cabinet wall.

2. **Cut open the perforated area with side cutters.**

4.4 Installing UltraSite EDGE BTS core equipment for WCDMA upgrade

4.4.1 Installing the Connecting Duct unit to UltraSite EDGE BTS outdoor cabinet

Before you start

Review the *Overview of installing units* and pay careful attention to all warnings and cautions.

Summary

Note

This instruction applies to Outdoor cabinet only.

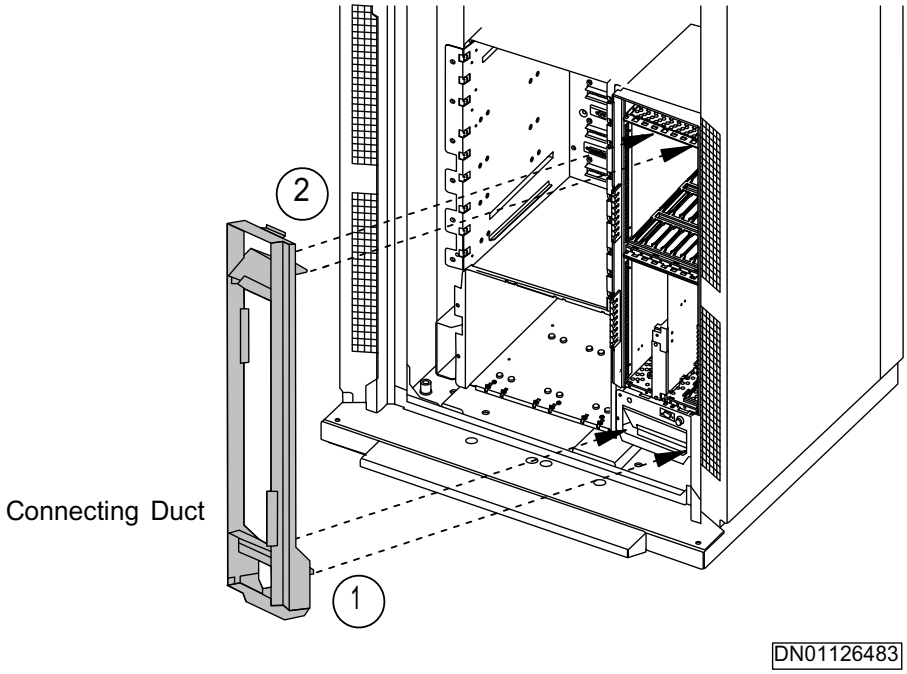


Figure 22. Installing the Connecting Duct to the Outdoor (OAKx) cabinet

Steps

1. **Ensure all units and unit cables are installed before installing the Connecting Duct.**
2. **Insert the hook in the lower part of the Connecting Duct to the opening in the front of the WTCA Fan.**
3. **Press the upper part of the Connecting Duct toward the BB rack until the duct locks.**

4.4.2 Cabling WCDMA antennas in UltraSite EDGE BTS with WCDMA Upgrade

Before you start

Review the *Overview of upgrading UltraSite EDGE BTS with WCDMA*.

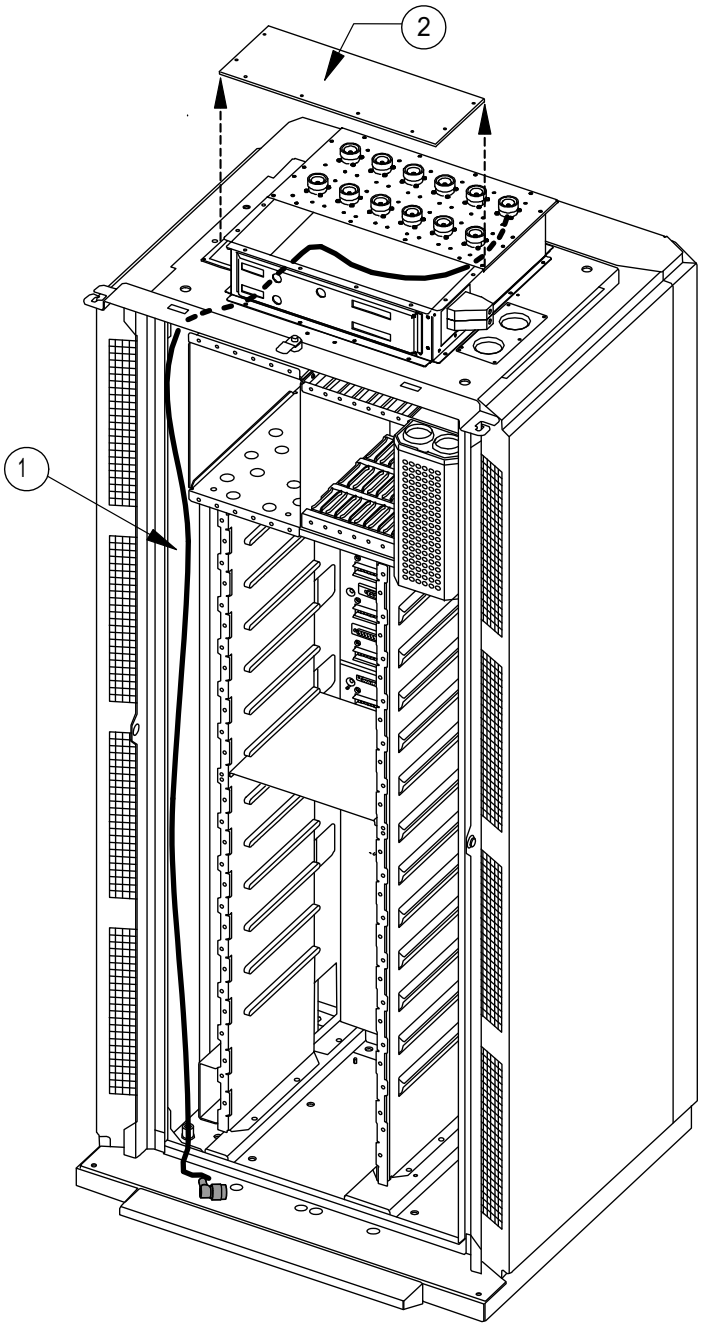
Summary

Caution

Minimise the number of times you bend the cable back and forth. The cables age through bending and may be damaged.

Caution

Do not bend the antenna cables more than is permitted. The smallest permissible bending radius for the antenna cables is 25 mm (1 inch).



1	WCDMA antenna cable
2	Antenna box front cover

Figure 23. Routing and installing WCDMA antenna cables

Steps

1. **Remove the antenna box front cover.**

   The antenna box front cover is replaced later with a new WCDMA Upgrade Kit antenna box front cover. Do not re-install the old cover.

2. **Disconnect and remove the excess GSM/EDGE antenna cables.**

3. **Mark the WCDMA antenna cables at both ends to identify the cables during routing and installation.**

   Mark the antenna cables as follows:

   - Main 1
   - Div 1
   - Main 2
   - Div 2
   - Main 3
   - Div 3

4. **Route the WCDMA antenna cables along the cabinet left side wall and to the antenna box.**

5. **Install the Bias-Tee units (optional) to the available cable connectors either outside of the antenna box (Indoor cabinet) or inside the antenna box (Outdoor cabinet).**

   Refer to *Overview of installing UltraSite EDGE BTS WCDMA units*.

6. **Connect the WCDMA antenna cables to the available cable connectors in the antenna box.**

7. **Secure each cable with four M3 screws.**

8. **Secure the WCDMA antenna cables with cable ties so that they will not get in the way when installing WCDMA Upgrade Kit racks and WCDMA units into the lower compartment of the BTS cabinet.**

4.4.3 Installing a BB rack IP shield to UltraSite EDGE BTS outdoor cabinet with WCDMA Upgrade

Before you start

Review the *Overview of upgrading UltraSite EDGE BTS with WCDMA*.

Summary

Note

The IP shield is installed to the Outdoor cabinet only.

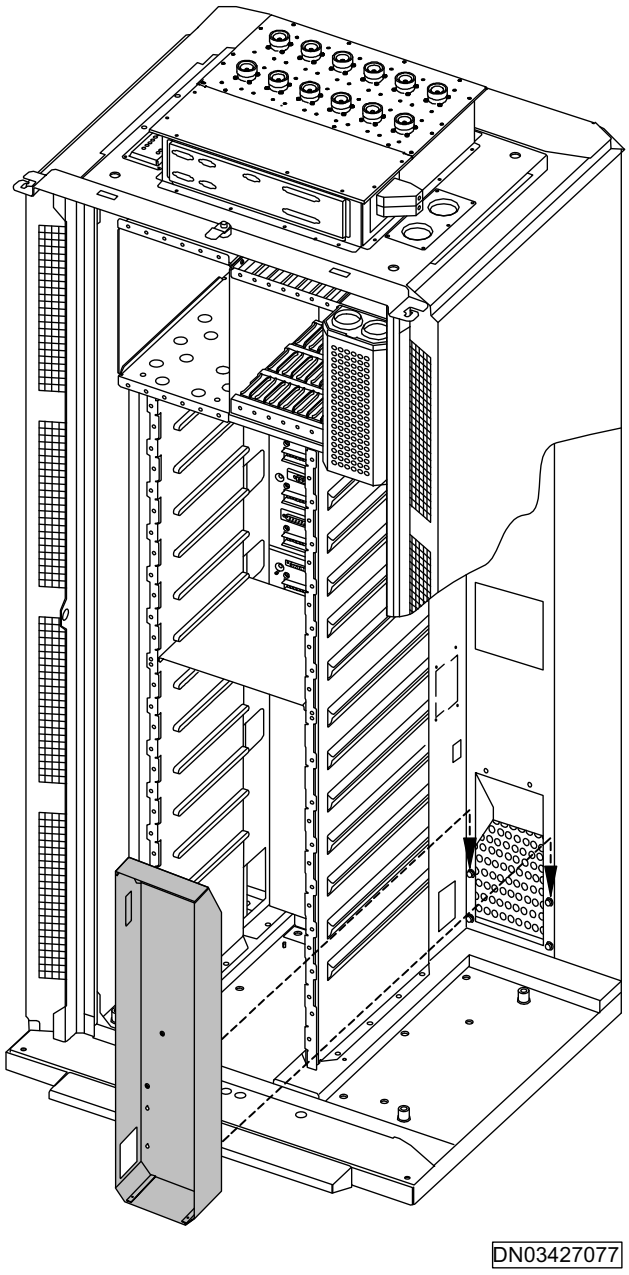


Figure 24. Installing the BB rack IP shield to the Outdoor cabinet

Steps

1. **Ensure that the RF Filter Fan mounting screws are in place but not completely tightened.**

Loosen them if necessary to allow BB rack IP shield installation. If the screws are missing, install them.

2. **Insert the BB rack IP shield to the lower compartment of the cabinet.**

3. **Fit the screw holes in the BB rack IP shield to the mounting screws of the removed RF Filter Fan.**

4. **Press the BB rack IP shield down so that the mounting screws lock to the narrowing screw holes in the BB rack IP shield.**

5. **Tighten the mounting screws.**

   See *Torque settings*.

4.4.4 Installing the RF rack IP shield to UltraSite EDGE BTS outdoor cabinet with WCDMA Upgrade

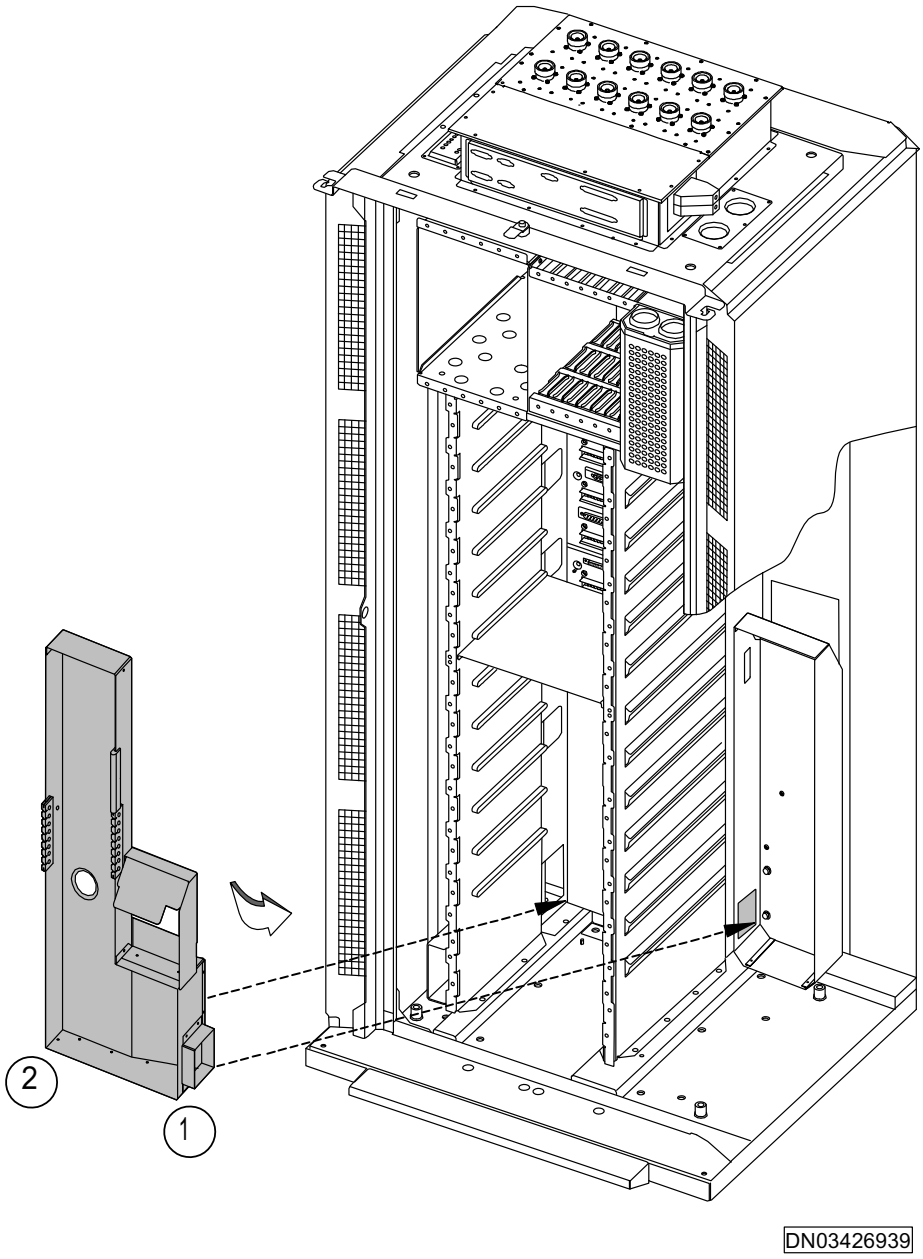
Before you start

Review the *Overview of upgrading UltraSite EDGE BTS with WCDMA*.

Summary

Note

The IP shield is installed to the Outdoor cabinet only.



1	IP shield extension
2	IP shield

Figure 25. Installing the RF rack IP shield to the Outdoor cabinet

Steps

1. **Insert the RF rack IP shield to the lower compartment of the cabinet the extended side first.**
2. **Guide the small extension in the lower part of the RF Rack IP shield through the hole in the lower compartment of the cabinet and through the hole in the BB Rack IP shield.**
3. **Route the cable of the lowest unit cooling fan through the RF rack IP shield.**

   Ensure that the cable can reach the connectors in the RF rack, installed later.
4. **Turn the RF rack IP shield and press it against the cabinet core back wall.**
5. **Tighten the RF rack IP shield mounting screws (six M3x8 Torx).**

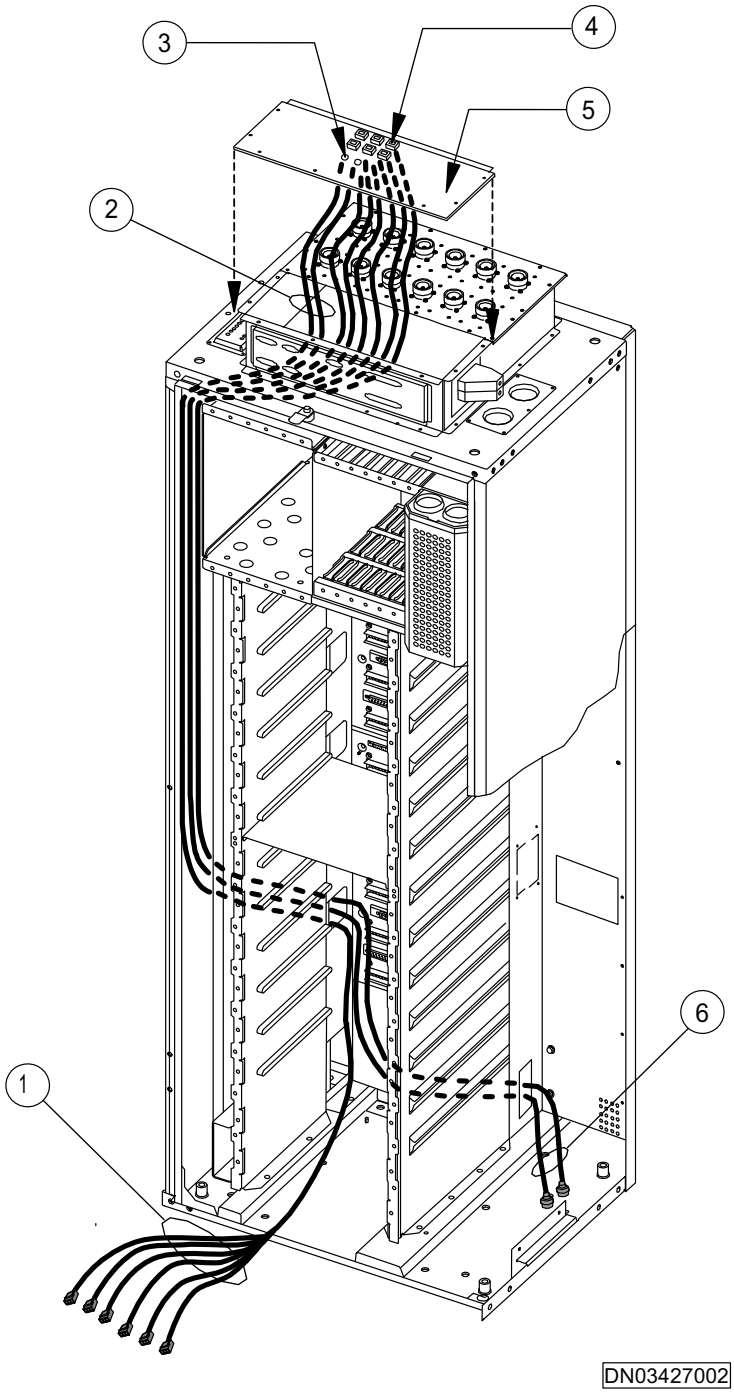
   See *Torque settings*.

4.4.5 Installing MHA cables, Chain Clock cables and antenna box cover to UltraSite EDGE BTS outdoor with WCDMA Upgrade

Before you start

Review the *Overview of upgrading UltraSite EDGE BTS with WCDMA*.

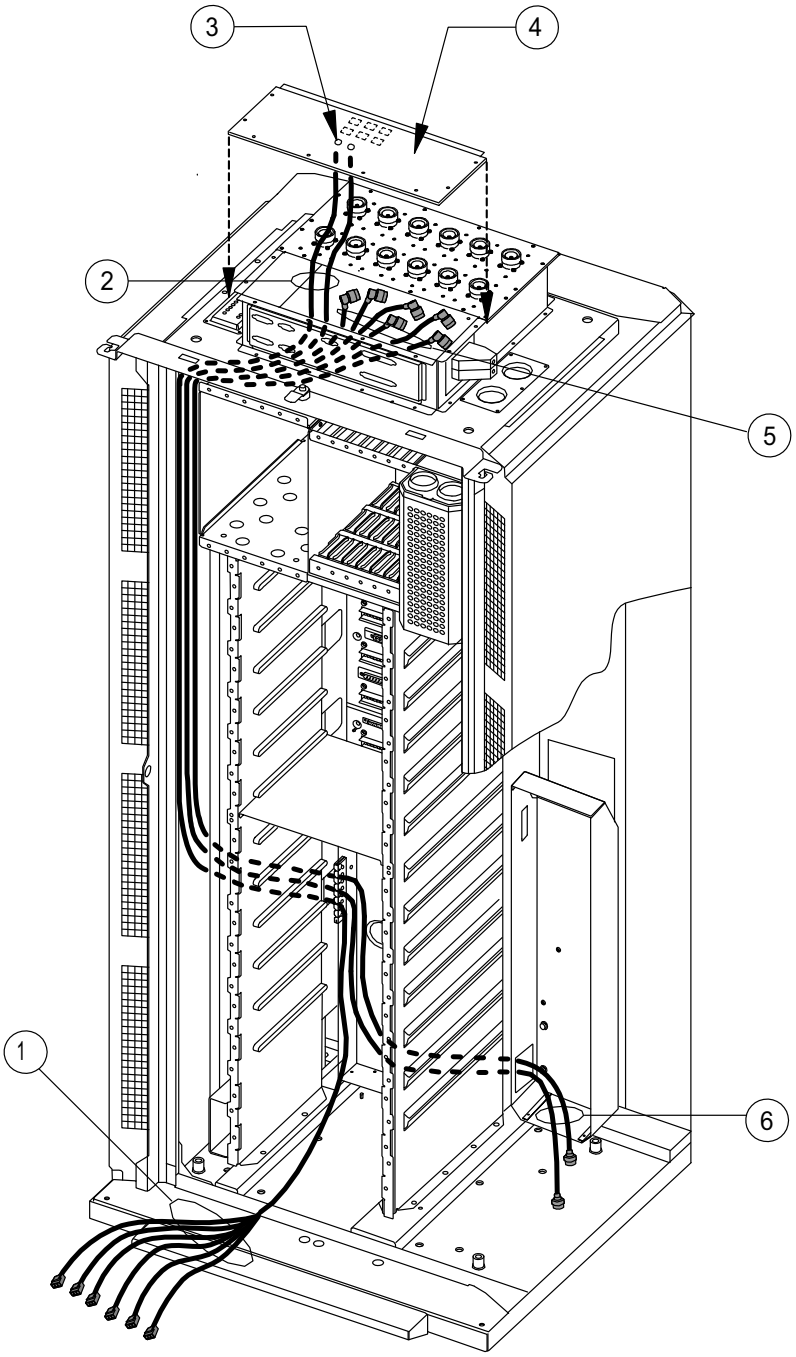
Summary



1	MHA cables dn994144

2	Chain Clock cables
3	Chain Clock cable connectors
4	MHA cable connectors
5	WCDMA Upgrade Kit antenna box front cover
6	Chain Clock cables

Figure 26. Installing MHA cables, Chain Clock cables and the antenna box front cover to the Indoor cabinet



1	MHA cables dn994144

2	Chain Clock cables
3	Chain Clock cable connectors
4	WCDMA Upgrade Kit antenna box front cover
5	MHA cables dn994144
6	Chain Clock cables

Figure 27. Installing MHA cables, Chain Clock cables and the antenna box front cover to the Outdoor cabinet

Steps

1. *If* you are installing MHA cables, Chain Clock cables, and the antenna box cover to the Indoor cabinet,

   Then

   perform the following tasks:

   a. Unpack the new WCDMA Upgrade Kit antenna box front cover and check for visible damage.
   b. Cut open the six square perforated connector holes in the antenna box front cover with side cutters.
   c. Check the markings on the MHA cables and on the antenna box front cover.
   d. Connect the cables to the correct connector holes as shown in the following table.

Table 5. MHA cable connections for the Indoor cabinet

MHA cable	Antenna box front cover	WAF rack connector
Ant 0	Ant 0	X21
Div 0	Div 0	X20
Ant 1	Ant 1	X19
Div 1	Div 1	X18
Ant 2	Ant 2	X17

Table 5. MHA cable connections for the Indoor cabinet (cont.)

MHA cable	Antenna box front cover	WAF rack connector
Div 2	Div 2	X16

e. Connect the two Chain Clock cables to the round connector holes in the antenna box front cover as shown in the following table.

Table 6. Chain Clock cable connectors

Chain Clock Cable	Antenna box front cover	BB rack connector
REF CLK	REF	X418
REF R CLK	REF R	X419

f. Route the cables through the antenna box, along the cabinet side wall and through the cable entry holes in the lower compartment of the cabinet.

g. Screw the new front cover to the antenna box with M3x6 Torx screws.

2. *If* you are installing MHA cables, Chain Clock cables and the antenna box cover to the Outdoor cabinet,

   Then

   perform the following tasks:

   a. Unpack the new WCDMA Upgrade Kit antenna box front cover and check for visible damage.

   b. Connect the two Chain Clock cables to the round connector holes in the antenna box front cover as shown in the following table.

Table 7. Chain Clock cable connectors

Chain Clock Cable	Antenna box front cover	BB rack connector
REF CLK	REF	X418
REF R CLK	REF R	X419

c. Route the Chain Clock cables through the antenna box, along the cabinet side wall and through the cable entry holes in the lower compartment of the cabinet.
d. Route the MHA cables to the antenna box, along the cabinet side wall and through the cable entry holes in the lower compartment of the cabinet.
e. Insert the cables to the cable block in the RF rack IP shield.
f. Screw the new front cover to the antenna box with M3x6 Torx screws.

4.4.6 Installing the heater control cable to UltraSite EDGE BTS outdoor cabinet with WCDMA Upgrade

Before you start

Review the *Overview of upgrading UltraSite EDGE BTS with WCDMA*.

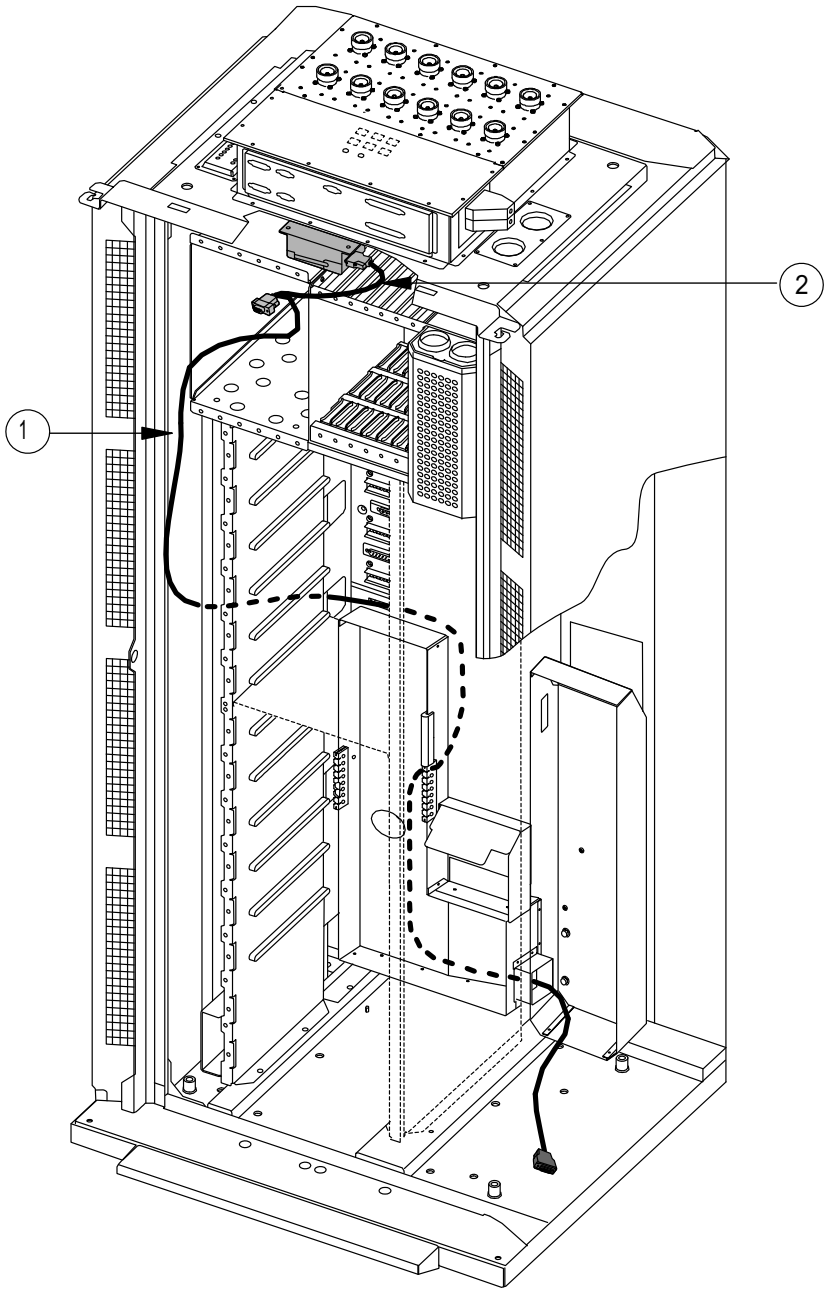
Summary

Note

The heater control cable is installed to the Outdoor cabinet only.

Note

The heater control cable is an optional part of the WCDMA Upgrade Kit. It is needed only if you need to install heater unit to the Outdoor cabinet door.



1	Heater control cable dn994122
2	To door switch box

Figure 28. Routing and installing the heater control cable to the Outdoor cabinet

Steps

1. **Route the heater control cable through the RF rack IP shield and the BB rack IP shield, and along the cabinet side wall.**
2. **Insert the cable to the cable block in right side of the RF rack IP shield.**
3. **Connect the short branch of the cable to the door switch box.**

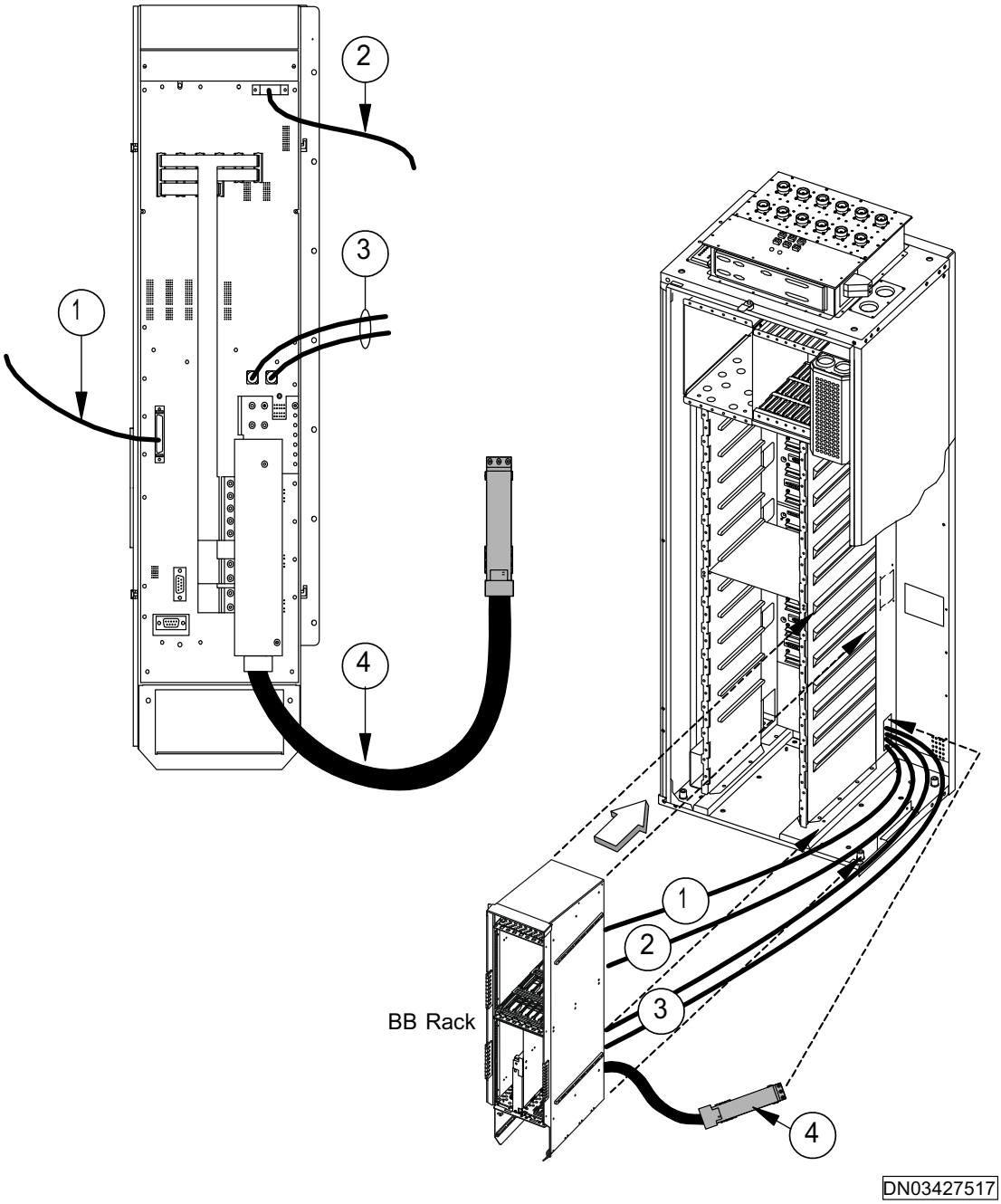
4.4.7 Installing the BB rack to UltraSite EDGE BTS with WCDMA Upgrade

Before you start

Review the *Overview of upgrading UltraSite EDGE BTS with WCDMA*.

Summary

BB Rack backplane, back view

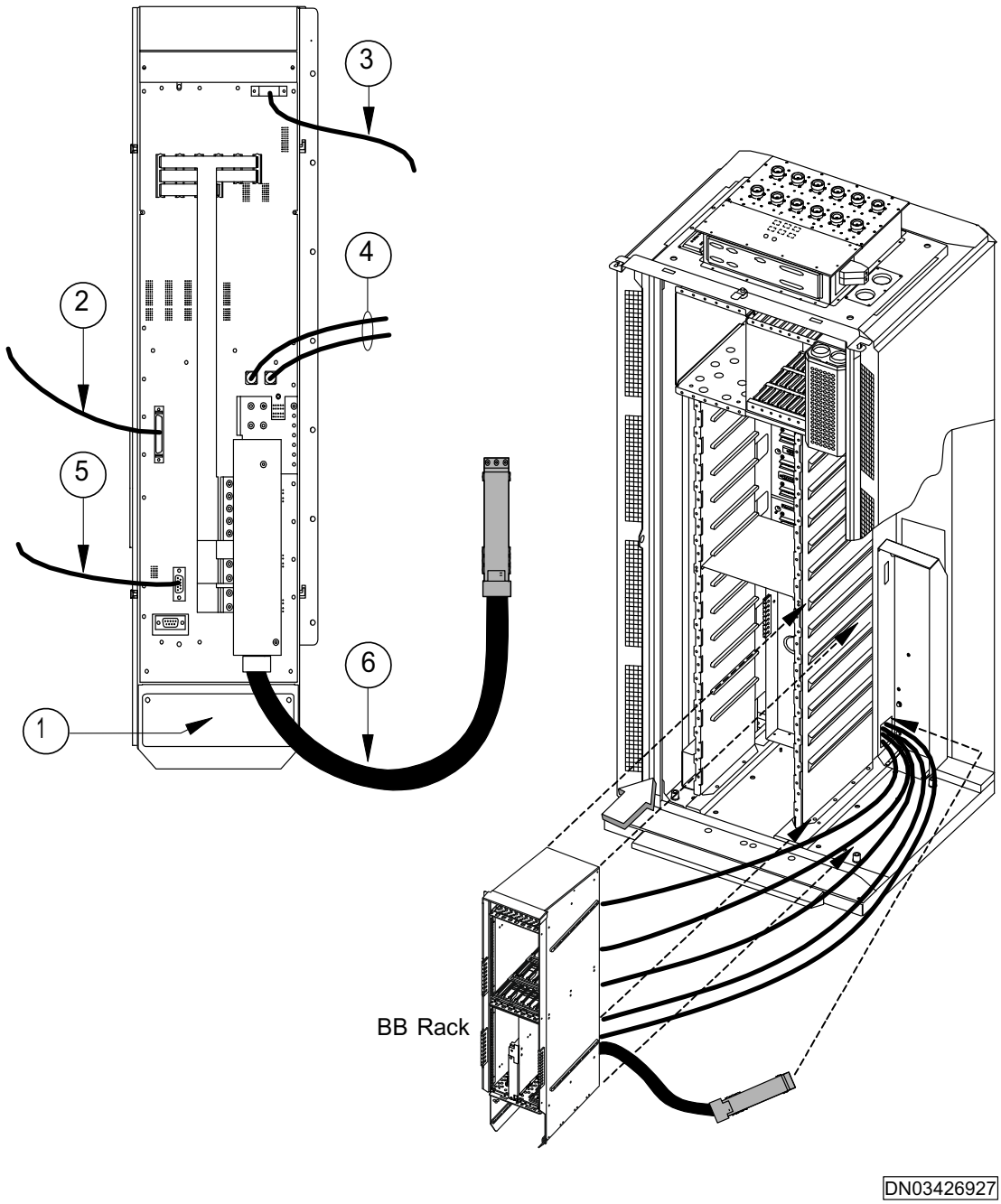


1	Bus cable

2	Bus cable
3	Chain clock cables
4	Main busbar

Figure 29. Connecting cables to the back of the BB rack backplane and installing the BB rack to the Indoor cabinet

BB Rack backplane, back view



1	WFA cover plate

2	Bus cable
3	Bus cable
4	Chain dock cables
5	Heater control cable
6	Main busbar

Figure 30. Connecting cables to the back of the BB rack backplane and installing the BB rack to the Outdoor cabinet

Steps

1. *If* you are installing the BB rack to the Indoor cabinet,

   Then

   Perform the following tasks:

   a. Connect the bus cables (1 and 2 in Figure 1) to the connectors in the back of the BB rack backplane (cable dn994105 to X330 connector, cable dn994107 to X331 connector).
   b. Connect the Chain Clock cables (3) to the connectors in the BB rack backplane (REF CLK cable to REF CLK connector X418, REF R CLK cable to REF R CLK connector X419).
   c. Route the bus cables (1 and 2) and the Main Busbar (4) through the cable entry.
   d. Insert BB rack to the unit slot.
   e. Make sure the main busbar is not bent behind the BB rack.

2. *If* you are installing the BB rack to the Outdoor cabinet,

   Then

   Perform the following tasks:

   a. Remove the cover plate from the WTCA Fan module.
   b. Fit the cover plate to the bottom of the BB rack (1 in Figure 2) so that the handle of the cover plate is inside the BB rack.
   c. Screw the cover plate to the BB rack with three M3 Torx screws.
   d. Connect the bus cables to the connectors in the back of the BB rack backplane (cable dn994105 to X330 connector, cable dn994107 to X331 connector).

e. Connect the Chain Clock cables to the connectors in the BB rack backplane (REF CLK cable to REF CLK connector X418, REF R CLK cable to REF R CLK connector X419).
f. Connect the heater control cable to connector X332 in the back of the BB rack backplane.
g. Route the bus cables and the Main Busbar through the cable entry in the lower compartment of the cabinet.
h. Insert BB rack to the unit slot.
i. Make sure the main busbar is not bent behind the BB rack.

4.4.8 Installing the WAF rack to UltraSite EDGE BTS with WCDMA Upgrade

Before you start

Review the *Overview of upgrading UltraSite EDGE BTS with WCDMA*.

Summary

Note

Take care not to damage the baseband cable and the MHA cables when inserting the WAF rack.

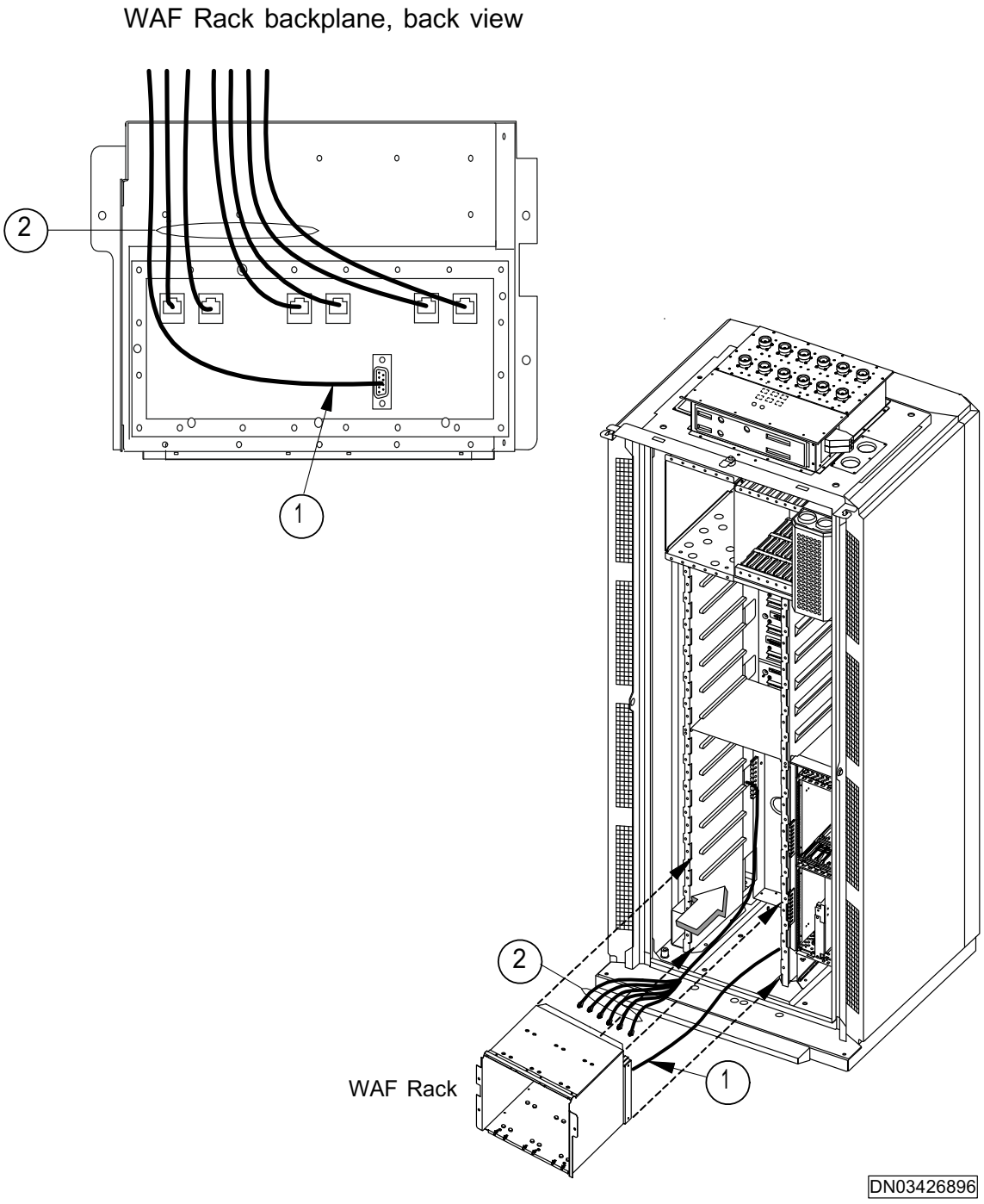


Figure 31. Connecting cables to the back of the WAF rack backplane and installing the WAF rack

Steps

1. **Connect the baseband cable dn994123 to connector X9 in the back of the WAF rack backplane (see 1 in Figure 1).**

2. **Route the baseband cable up and insert it to the cable block.**

   The baseband cable will later be connected to the RF rack.

3. **Connect the six MHA cables (2) to the connectors in the back of the WAF rack backplane as listed in the following table.**

Table 8. MHA cable connections

MHA cable	Antenna box front cover	WAF rack connector
Ant 0	Ant 0	X21
Div 0	Div 0	X20
Ant 1	Ant 1	X19
Div 1	Div 1	X18
Ant 2	Ant 2	X17
Div 2	Div 2	X16

4. **In Outdoor installation, insert the cables to the cable block in the RF rack IP shield.**

5. **Insert WAF rack to the unit slot.**

6. **Tighten the WAF rack mounting screws (M4 Torx) to 1.2 Nm.**

7. **Fit the M4 Torx mounting screw to the screw hole in the inside of the WAF rack and tighten the screw.**

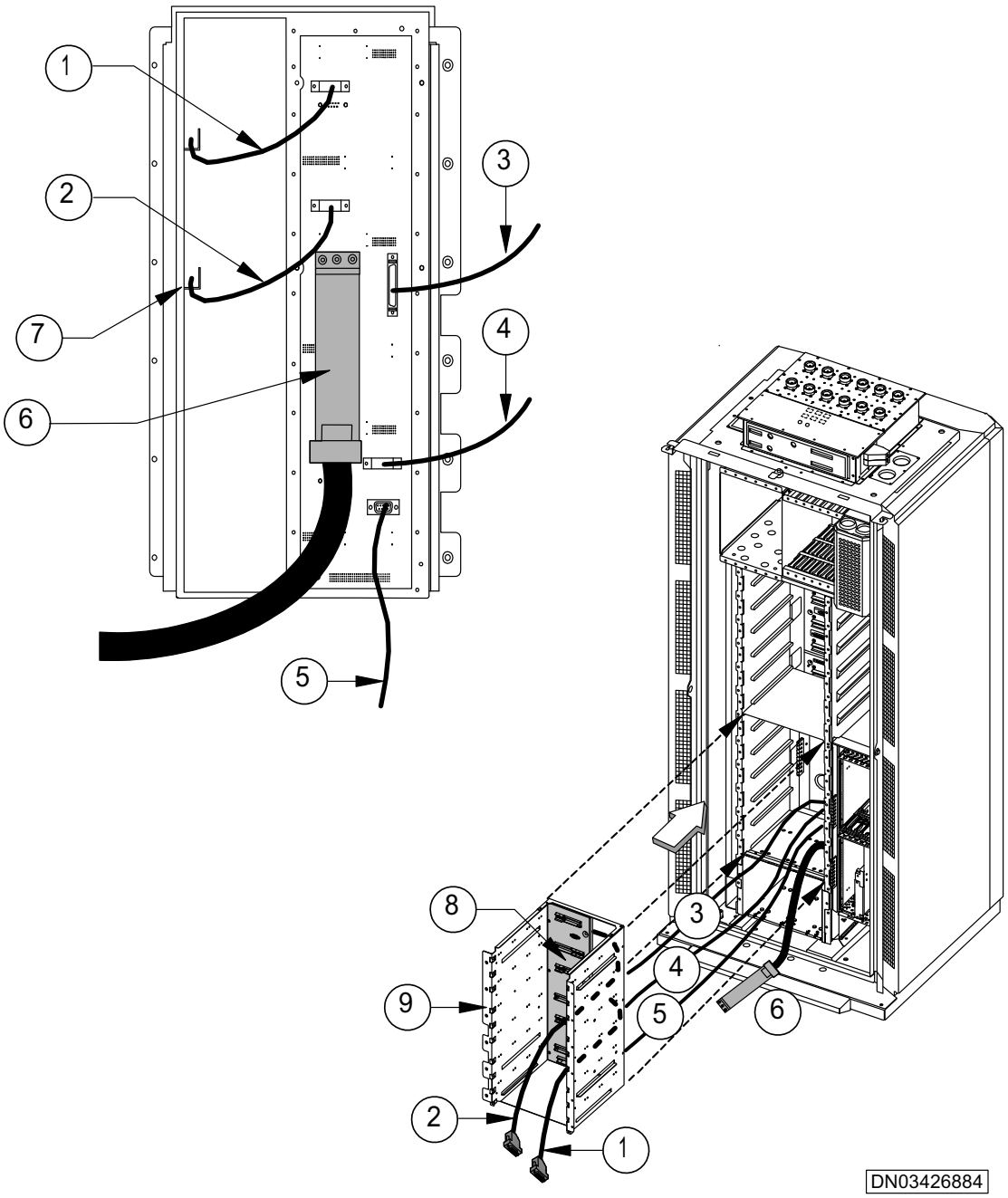
4.4.9 Installing the RF rack to UltraSite EDGE BTS with WCDMA Upgrade

Before you start

Review the *Overview of upgrading UltraSite EDGE BTS with WCDMA*.

Summary

RF Rackbackplane, back view



1Bus cable2Bus cable3Bus cable4Bus cable5Baseband Cable from the WAF rack6Main busbar from the BB rack, screws (6 pcs) tightened from the front of the RF rack7Cable holders8RF fack from IP shield9RF rack

Figure 32. Connecting cables to the RF rack backplane and installing the RF rack

Steps

1. **Remove the RF rack front IP shield from the front of the RF rack backplane.**

2. **Connect the bus cables to the connectors in the back of the RF rack backplane (two cables dn994106 to connector X92 and connector X93).**

3. **Route the bus cables 1 and 2 along the cable holders in the inside of the RF rack (lower dn994106 cable to the lower cable holder, upper dn994106 cable to the upper cable holder).**

   Bus cables dn994106 are later connected to the Wideband Summing and Multiplexing (WSM) unit that is installed in the BB rack.

4. **Connect bus cables coming from the BB rack to the connectors in the RF backplane (cable dn994105 to connector X90, cable dn994107 to connector X91).**

5. **Connect the baseband cable (dn994123) coming from the WAF rack to connector X43 in the back of the RF rack.**

6. **Insert the RF rack to the unit slot.**

7. **Connect the Main Busbar to the back of the RF rack backplane; tilt the RF rack forward to ease connecting.**

8. **Tighten the six Main Busbar screws (M3x8 Torx) from the front of the RF rack backplane.**

   See *Torque settings*.

9. **Push the RF rack all the way in to the unit slot.**

10. **Install the RF rack front IP shield to the front of the RF rack backplane.**

11. **Connect the three unit fan cables to the connectors in the front of the RF rack backplane.**

12. Tighten the RF rack mounting screws (M4 Torx).

See *Torque settings*.

13. Tighten the BB rack mounting screws (M4 Torx).

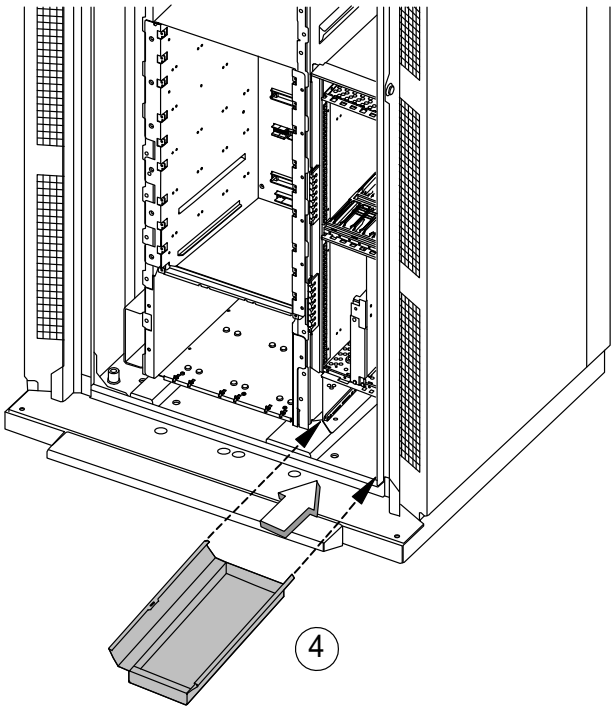
See *Torque settings*.

4.4.10 Installing the Wideband Fan Module (WTCA) to UltraSite EDGE BTS outdoor with WCDMA Upgrade

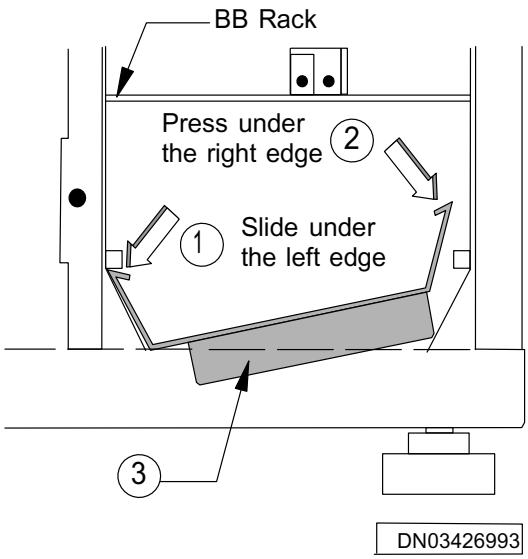
Before you start

Review the *Overview of upgrading UltraSite EDGE BTS with WCDMA*.

Summary



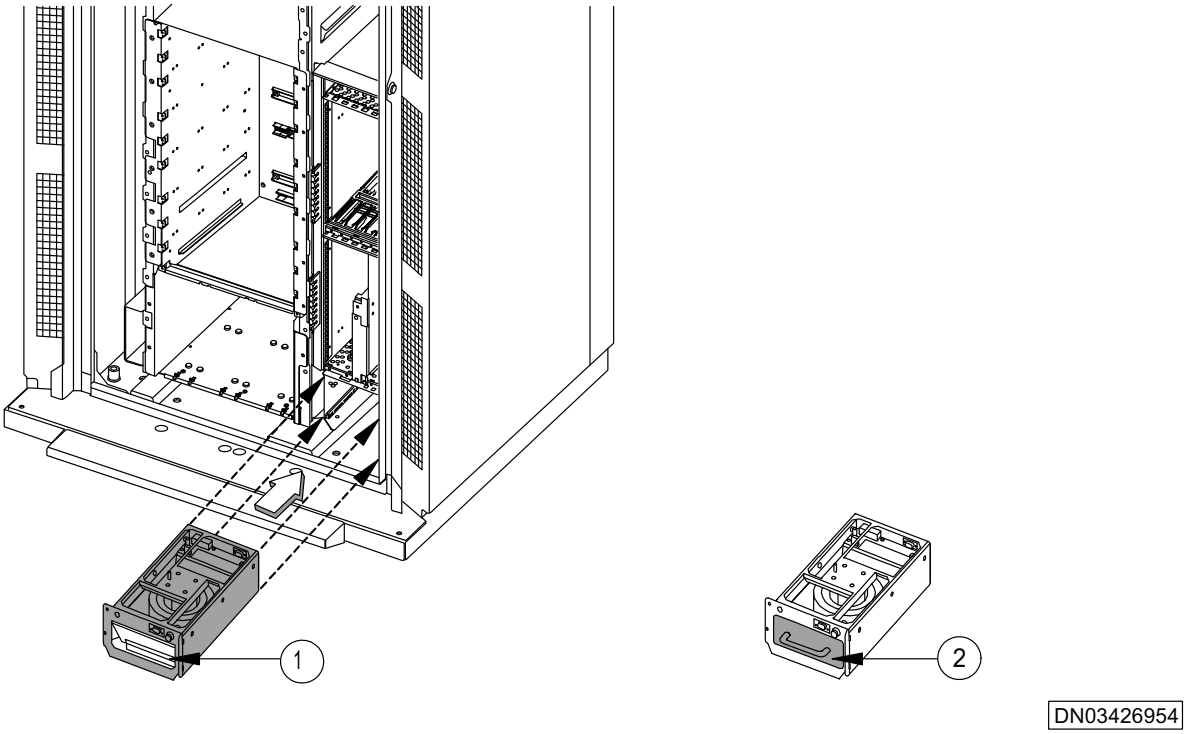
BB Rack and Bottom Plate, front view



1	Slide under the left edge

2	Press under the right edge
3	Bottom plate
4	WTCA fan module bottom plate

Figure 33. Installing the WTCA Fan Module Bottom Plate



1	WTCA Fan Module for Outdoor cabinet cover plate removed
2	WTCA Fan Module for Indoor cabinet cover plate installed

Figure 34. Installing the WTCA Fan Module

Steps

1. *If* you are installing in an outdoor cabinet,

   Then

   Make sure you have removed the WTCA Fan Module cover plate and installed it to the back of the BB rack.

2. *If* you are installing in an indoor cabinet,

   Then

   attach the cover plate to the WTCA Fan Module front panel.

3. **Unpack the WTCA Fan Module bottom plate and check for visible damage.**

   See *Unpacking the WTCA Fan Module bottom plate.*

4. **Slide the left edge of the bottom plate under the bottom left edge in the BB rack.**

5. **Press the right edge of the bottom plate under the bottom right edge in the BB rack.**

6. **Insert the WTCA Fan Module to the unit slot.**

7. **Tighten the WTCA Fan Module mounting screws.**

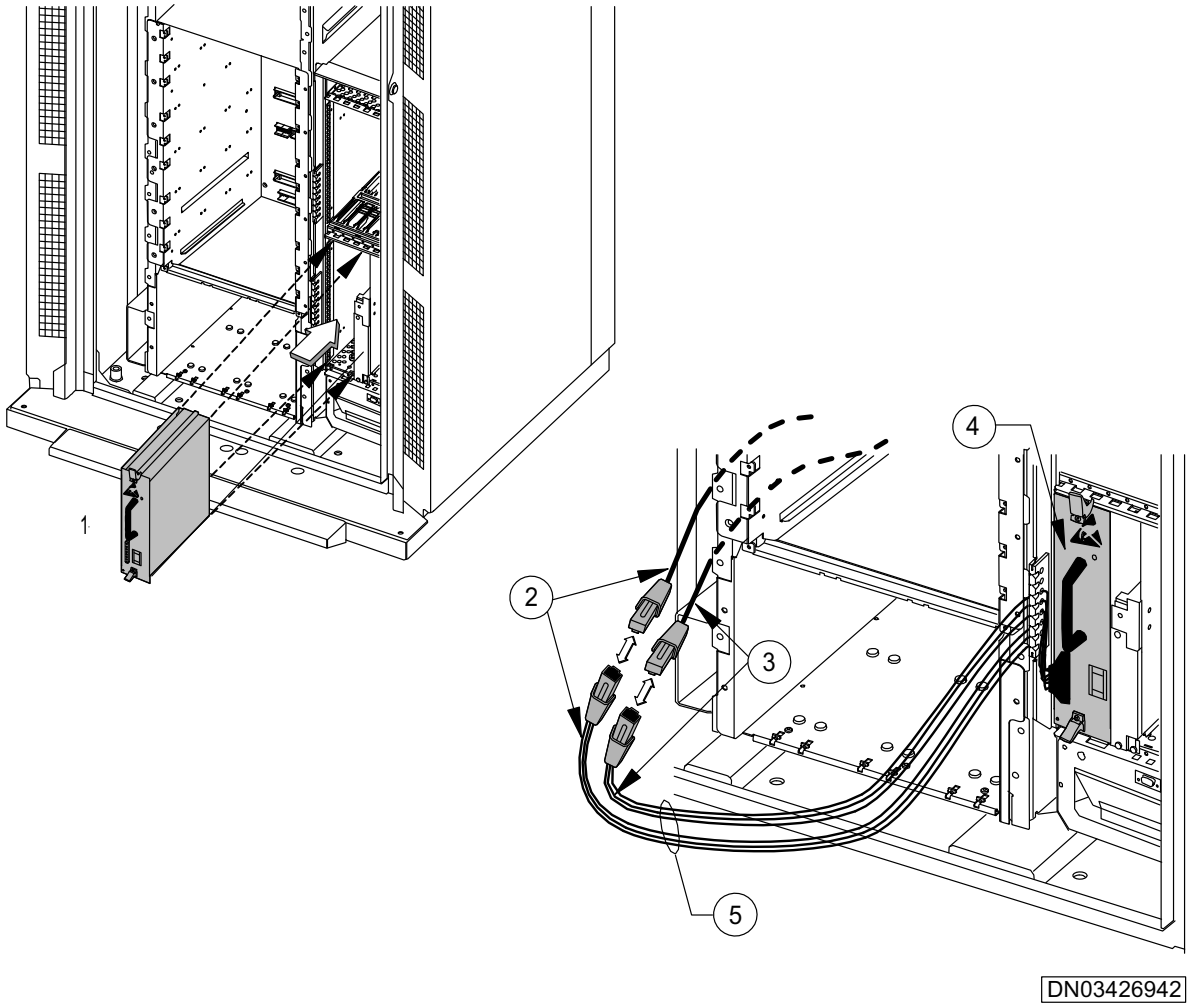
   See *Torque settings*.

4.4.11 Installing the Wideband Power Supply (WPS) unit to UltraSite EDGE BTS with WCDMA Upgrade

Before you start

Review the *Overview of upgrading UltraSite EDGE BTS with WCDMA*.

Summary



1	WPSx
2	Black
3	Blue
4	WPSx
5	Power Cable extension

Figure 35. Installing the WPS unit and the power cable extension

Steps

1. **Unpack the WPS unit from its protective package and check for visible damage.**

   See *Handling and unpacking units*.

2. **Insert the WPS to the unit slot.**

   See *Installing units with ejectors*.

3. **Close the unit ejectors.**

4. **Tighten the WPS mounting screws.**

   See *Torque settings*.

5. **Connect the branches of the power cable extension to the branches of the BTS power cable (black cable to the black branch, blue cable to the blue branch).**

6. **Connect the power cable extension to the connector in the front of the WPS.**

7. **Insert the power cables to the cable block in the BB rack.**

4.4.12 Installing the WCDMA Upgrade Kit door to the UltraSite EDGE BTS outdoor cabinet with WCDMA upgrade

Before you start

Review the *Overview of upgrading Ultrasite EDGE BTS with WCDMA*.

Summary

You will need a minimum of two installation personnel to install the WCDMA Upgrade Kit door to the Outdoor cabinet.

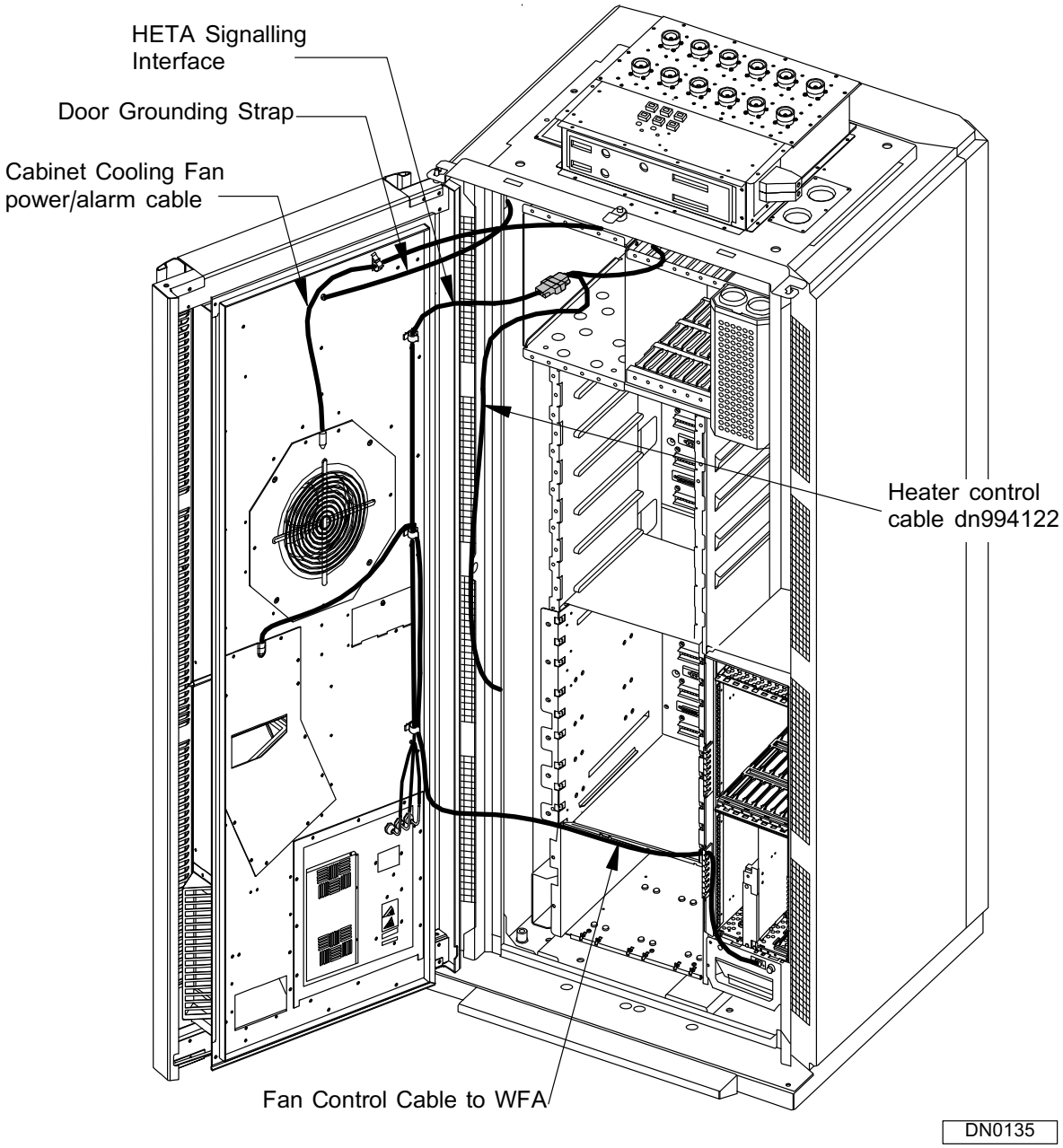


Figure 36. Installing the WCDMA Upgrade Kit door

Steps

1. **Install the WCDMA Upgrade Kit door to the Outdoor cabinet.**
2. **Install the door grounding strap.**
3. **Connect the Cabinet Cooling Fan power/alarm cable.**
4. **Install the heater unit (optional) to the WCDMA Upgrade Kit door.**
5. **Connect the heater unit signalling interface to the heater control cable (optional) coming from the BB Rack.**
6. **Connect the WTCA Fan Module control cable from the Heat Exchanger in the WWCDMA Upgrade Kit door to the connector in the front of the WTCA Fan Module.**
7. **Insert the WTCA Fan Module control cable to the cable holders in the door.**
8. **Insert the WTCA Fan Module cable to the cable block in the BB rack.**

4.5 Installing WCDMA units of UltraSite EDGE BTS

4.5.1 Overview of installing UltraSite EDGE BTS WCDMA units

Before you start

Ensure that the site is ready for unit installation.

Review the *Overview of installing the units of UltraSite EDGE BTS.* Pay careful attention to all warnings and cautions.

Summary

The WCDMA units are installed into the slots in the BTS after the WCDMA Upgrade Kit racks (RF Rack, WAF Rack and BB Rack) and cables have been installed in Nokia UltraSite EDGE BTS.

Warning

Be careful when handling the Power Supply Unit (PWSx) or WCDMA Power Supply Unit (WPS) and power cables. Electrical hazards exist. The power is ON in the GSM/EDGE part of the BTS.

Caution

Install the units into the slots with great care to avoid damage to the backplanes and connectors.

Note

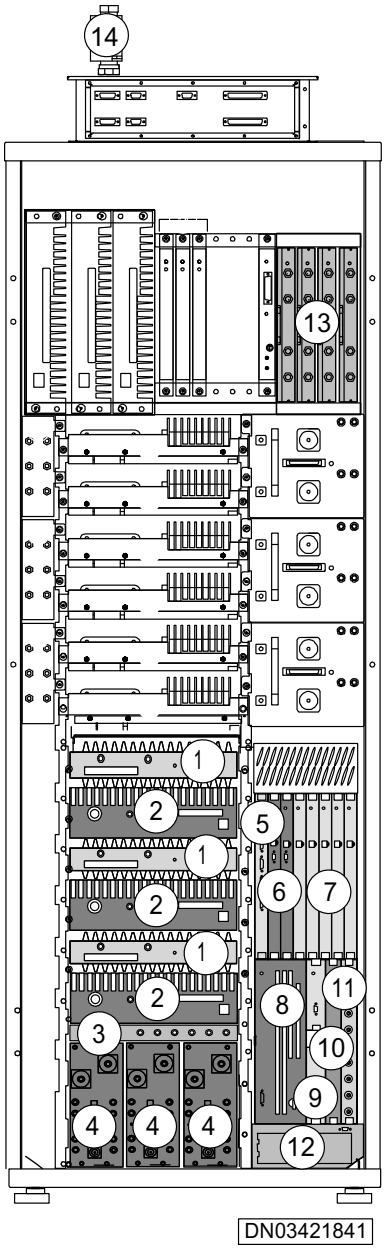
Protect all vacant connectors and slots in the Outdoor cabinet with connector caps and dummy panels.

Note

Ensure all unit mounting screws are properly secured.

Note

Follow applicable procedures for installing *units with handles* and units with ejectors.



1	WCDMA Transceiver unit (WTR)
2	WCDMA Power Amplifier unit (WMP)
3	WCDMA Input Combiner unit (WIC)
4	WCDMA Antenna Filter unit (WAF)

5	WCDMA Summing and Multiplexing unit (WSM)
6	WCDMA Application Manager unit (WAM)
7	WCDMA Signal Processor unit (WSP)
8	WCDMA Power Supply unit (WPS)
9	WCDMA System Clock unit (WSC)
10	ATM Multiplexer unit (AXU)
11	Interface unit (IFU)
12	WTCA Fan Module
13	Transmission unit (VXxx)
14	Bias Tee unit (Bias-T)

Figure 37. WCDMA unit positions in Nokia UltraSite EDGE BTS

Steps

1. **Install an Antenna Filter (WAF) unit.**
2. **Install a Mini Power Amplifier (WMP) unit.**
3. **Install a Transmitter and Receiver (WTR) unit.**
4. **Install an Input Combiner (WIC) unit.**
5. **Install a Summing and Multiplexing (WSM) unit.**
6. **Install an Application Manager (WAM) unit.**
7. **Install a Signal Processor (WSP) unit.**
8. **Install a System Clock (WSC) unit.**
9. **Install an ATM Cross-connect (AXU) unit.**
10. **Install an Interface (IFU) unit.**
11. **Install a Transmission unit box cover.**
12. **Install a Wideband Power Supply (WPS) unit.**

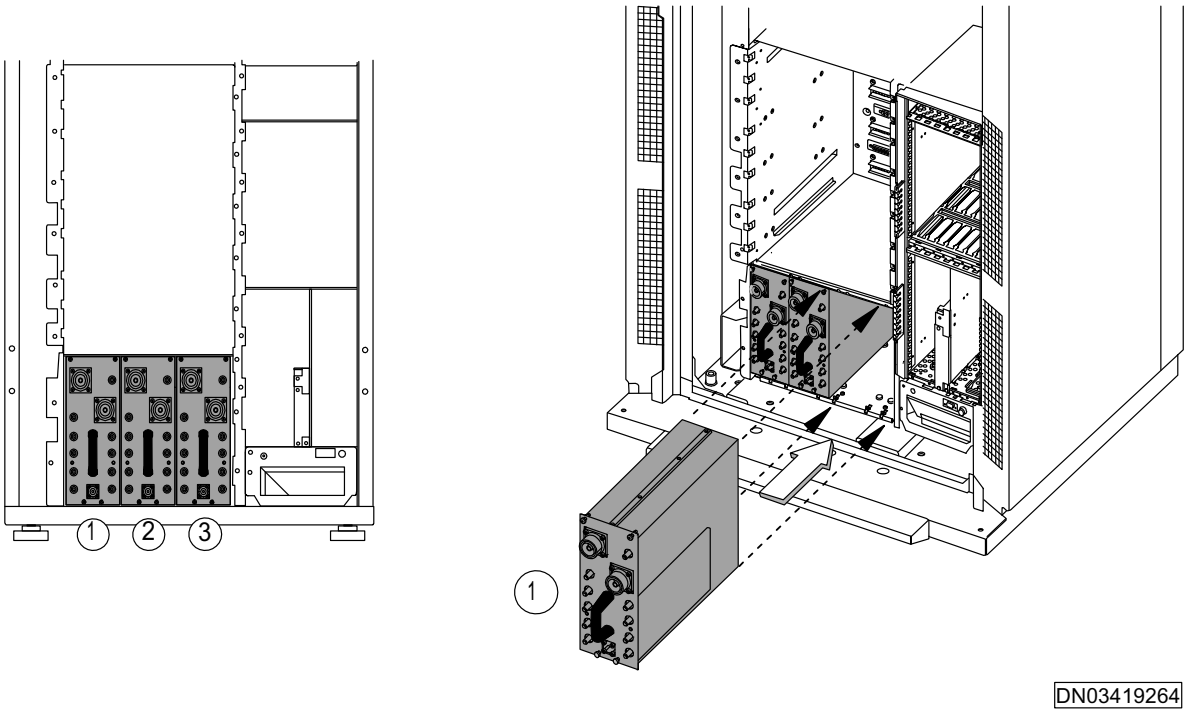
4.5.2 Installing a Wideband Antenna Filter (WAF) unit in UltraSite EDGE BTS with WCDMA upgrade

Before you start

Review the *Overview of installing WCDMA units.* Pay careful attention to all warnings and cautions.

Summary

The cabinet provides three slots for the WAF units.



1	WAFx

Figure 38. Installing the WAF units

Steps

1. Install the units from left to right.

2. **Align the WAF unit top and bottom guide trails to the guide trails of the rack.**

3. **Slide the WAF unit on the rack into the cabinet core.**

4. **Check that the rear connectors are fully engaged.**

5. **Tighten the screws on the unit front panel.**

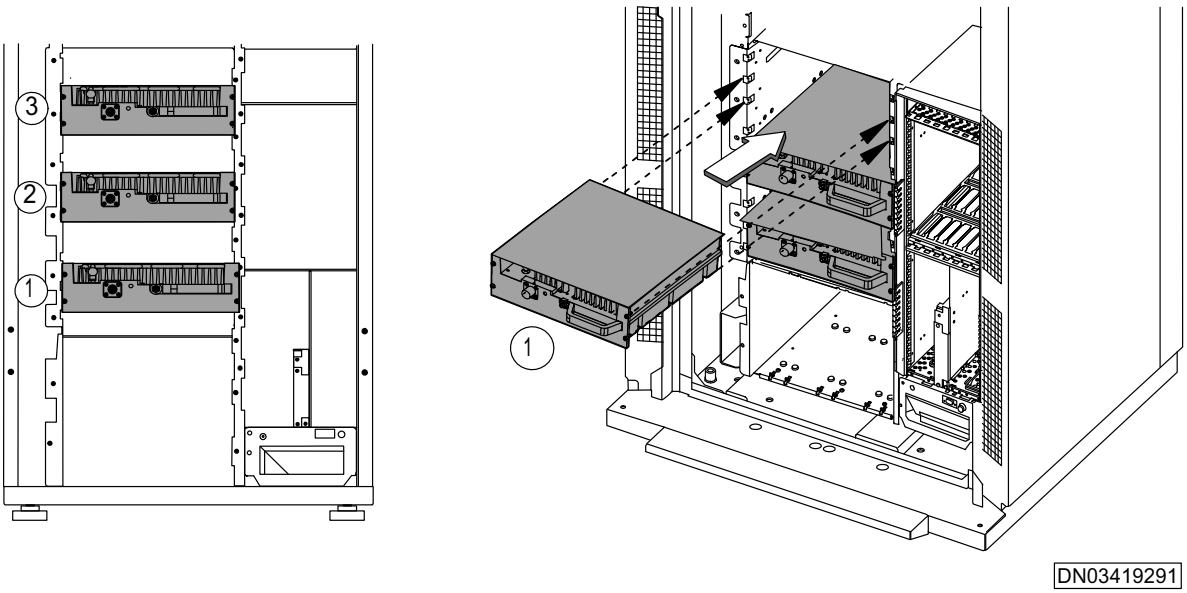
   Lifting the unit eases the tightening.

4.5.3 Installing a Wideband Mini Power Amplifier (WMP) unit in UltraSite EDGE BTS with WCDMA upgrade

Before you start

Review the *Overview of installing WCDMA units.* Pay careful attention to all warnings and cautions.

Summary



1	WMPx (units 1, 2 and 3)

Figure 39. Installing the WMP units

The cabinet provides three slots for the WMP units.

Steps

1. **Install the WMPs in this order:**
   a. Install the lowest WMP.
   b. Install the middle WMP.
   c. Install the upper-most WMP.
2. **Align the left and right guide trails of the WMP unit to the guide trails of the rack.**
3. **Slide the WMP unit into the cabinet core.**
4. **Check that the rear connectors are fully engaged.**
5. **Tighten the screws on the unit front panel.**

   Lifting the unit eases the tightening.

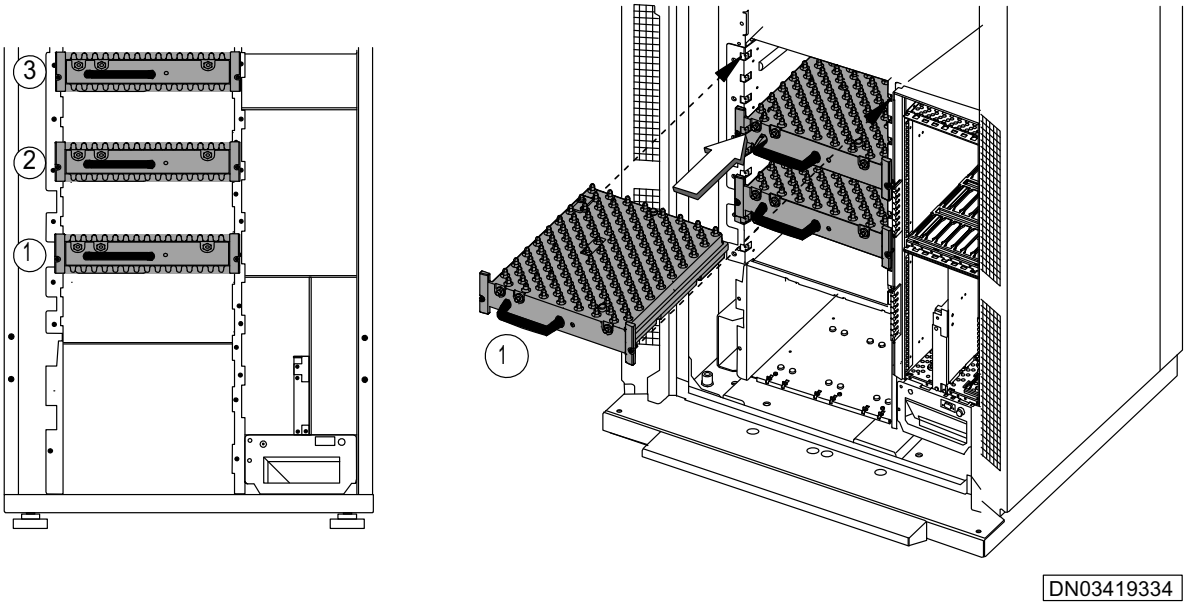
4.5.4 Installing a Wideband Transmitter and Receiver (WTR) unit in UltraSite EDGE BTS with WCDMA upgrade

Before you start

Review the *Overview of installing WCDMA units.* Pay careful attention to all warnings and cautions.

Summary

The cabinet provides three (3) slots for WTR units.



1	WTRx

Figure 40. Installing the WTR units

Steps

1. **Install the WTRs in this order:**
   a. Install the lowest WTR.
   b. Install the middle WTR.
   c. Install the upper-most WTR.
2. **Align the left and right guide trails of the WTR unit to the guide trails of the rack.**
3. **Slide the WTR unit into the cabinet core.**
4. **Check that the rear connectors are fully engaged.**
5. **Tighten the screws on the unit front panel.**

Lifting the unit eases the tightening.

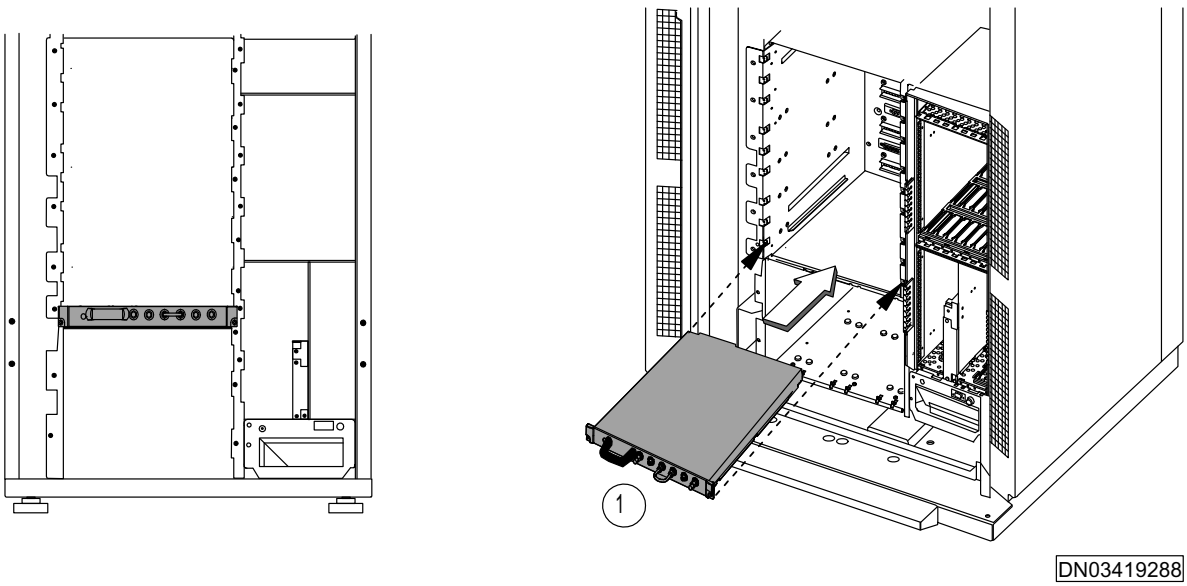
4.5.5 Installing a Wideband Input Combiner (WIC) unit in UltraSite EDGE BTS with WCDMA upgrade

Before you start

Review the *Overview of installing WCDMA units.* Pay careful attention to all warnings and cautions.

Summary

The cabinet provides one (1) slot for the WIC unit.



1	WICx

Figure 41. Installing the WIC unit

Steps

1. Align the WIC unit's left and right guide trails to the guide trails of the rack.

2. **Slide the WIC unit into the cabinet core.**

3. **Check that the rear connectors are fully engaged.**

4. **Tighten the screws on the unit front panel.**

   Lifting the unit eases the tightening.

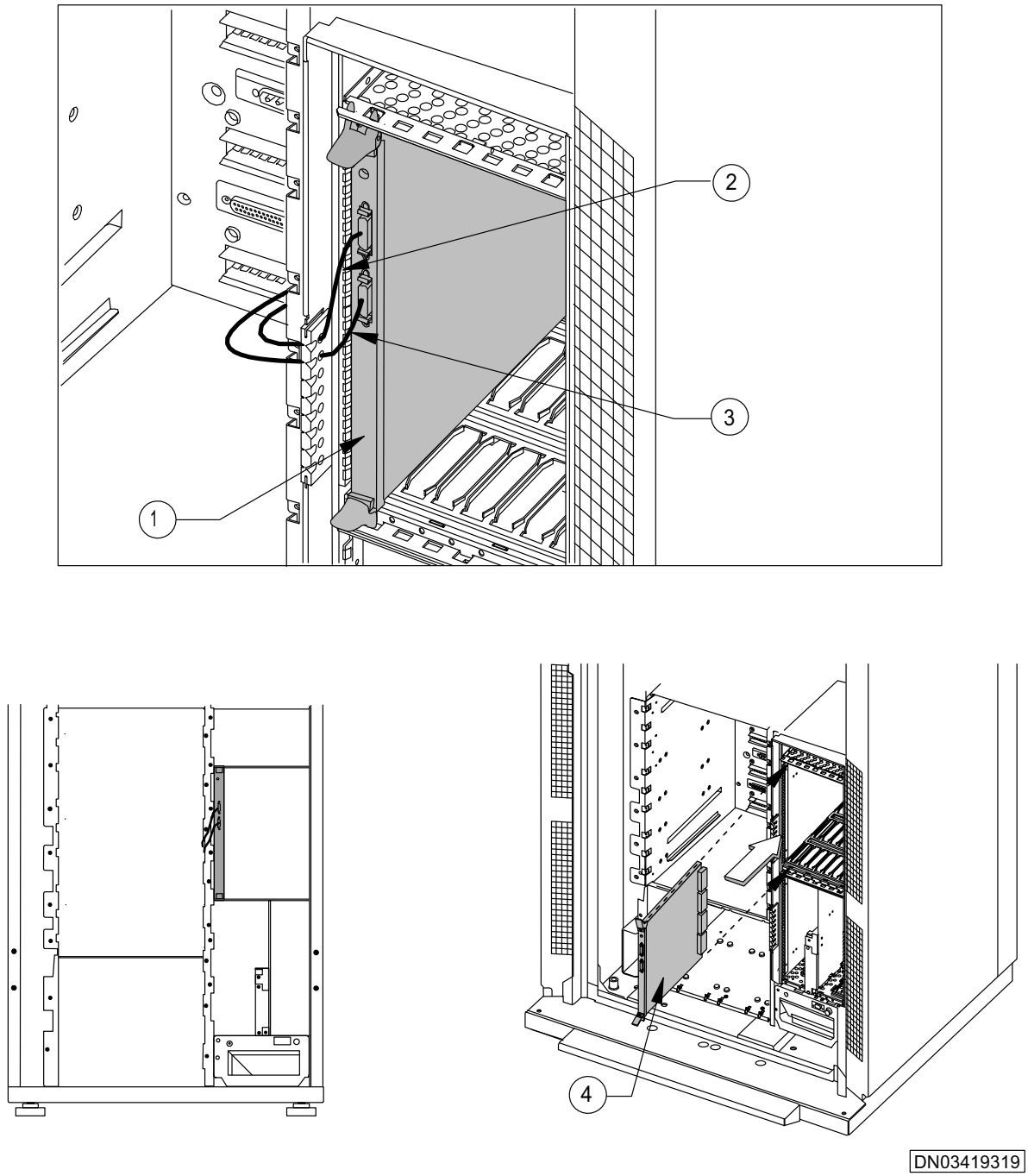
4.5.6 Installing a Wideband Summing and Multiplexing (WSM) unit in UltraSite EDGE BTS with WCDMA upgrade

Before you start

Review the *Overview of installing WCDMA units.* Pay careful attention to all warnings and cautions.

Summary

The cabinet provides one (1) slot for the WSM unit.



1	WSMx

2	Bus Cable dn994106 from connector X93 in the RF Rack
3	Bus Cable dn994105 from connector X92 in the RF Rack
4	WSMx

Figure 42. Installing the WSM unit

Steps

1. **Hold the ejectors open.**
2. **Slide the WSM unit into the rack.**
3. **Close the ejectors.**

   The ejectors fix the unit completely so that the rear connectors are fully engaged.
4. **Tighten the screws on the unit front panel.**

   Lifting the unit eases the tightening.
5. **Connect the bus cables from the RF rack to the connectors in the front of the WSM unit as follows:**
   - cable dn994105 to the lower connector in the WSM
   - cable dn994106 to the upper connector.
6. **Insert the bus cables in the cable block next to the WSM in the BB rack.**

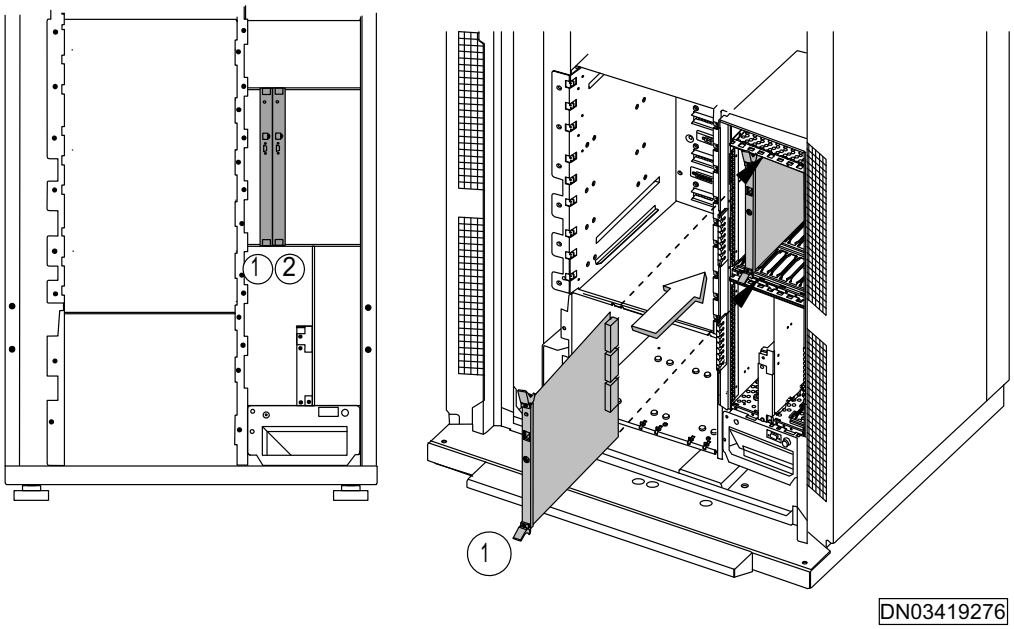
4.5.7 Installing a Wideband Application Manager (WAM) unit in UltraSite EDGE BTS

Before you start

Review the *Overview of installing WCDMA units.* Pay careful attention to all warnings and cautions.

Summary

The cabinet provides two (2) slots for the WAM units.



1	WAMx

Figure 43. Installing the WAM units

Steps

1. **Install the WAM units from left to right.**
2. **Hold the ejectors open.**
3. **Slide the WSM unit into the rack.**
4. **Close the ejectors.**

   The ejectors fix the unit completely so that the rear connectors are fully engaged.

5. **Tighten the screws on the unit front panel.**

   Lift the unit to ease the tightening.

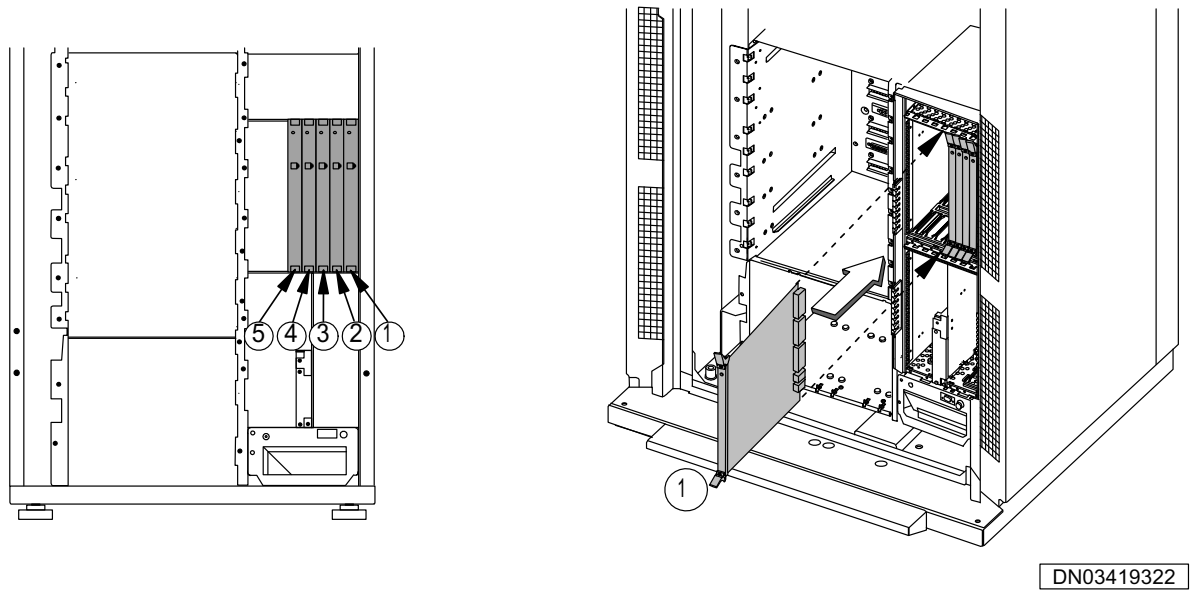
4.5.8 Installing a Wideband Signal Processor (WSP) unit in UltraSite EDGE BTS with WCDMA upgrade

Before you start

Review the *Overview of installing WCDMA units.* Pay careful attention to all warnings and cautions.

Summary

The cabinet provides five (5) slots for the WSP units.



1,- 2,- 3,- 4,- 5	WSPx

Figure 44. Installing the WSP units

Steps

1. Install the units from right to left.

2. **Hold the ejectors open.**

3. **Slide the WSP unit into the rack.**

4. **When the WSP unit is in place, close the ejectors.**

   The ejectors fix the unit completely so that the rear connectors are fully engaged.

5. **Tighten the screws on the unit front panel.**

   Lift the unit to ease the tightening.

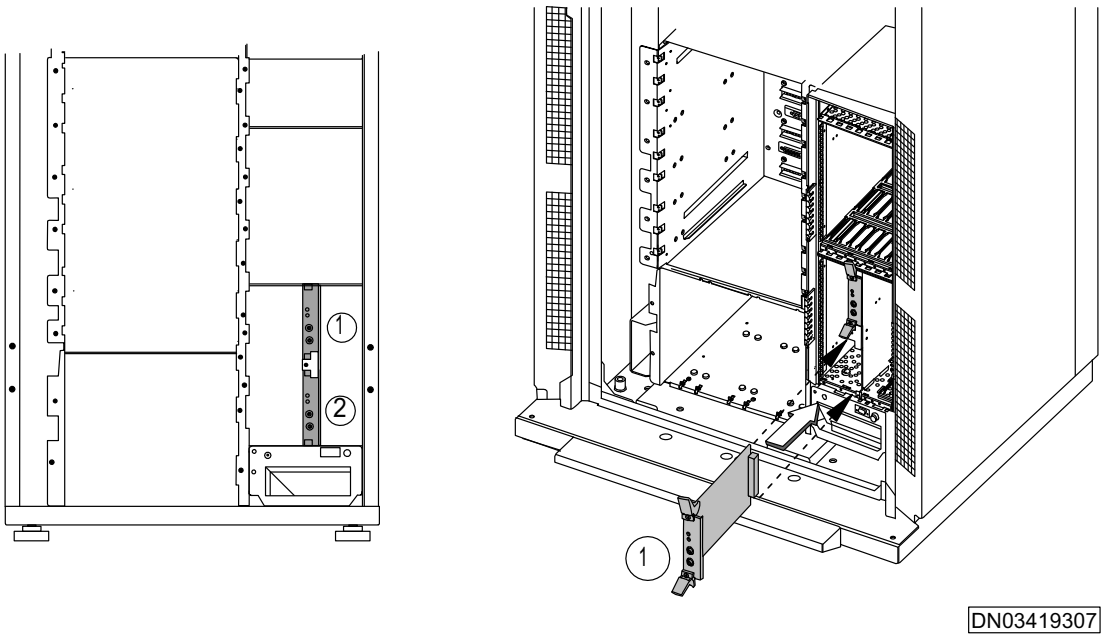
4.5.9 Installing a Wideband System Clock (WSC) unit in UltraSite EDGE BTS with WCDMA upgrade

Before you start

Review the *Overview of installing WCDMA units.* Pay careful attention to all warnings and cautions.

Summary

The cabinet provides two (2) slots for the WSC units.



1	WSCx

Figure 45. Installing the WSC units

Steps

1. **Slide the WSC units into the racks in this order:**
   a. Slide the upper WSC unit into the rack.
   b. Slide the lower WSC unit into the rack.
2. **Hold ejectors in an open position.**
3. **Close the ejectors when the WSC unit is in place.**

   The ejectors fix the unit completely so that the rear connectors are fully engaged.
4. **Tighten the screws on the unit front panel.**

   Lift the unit to ease the tightening.

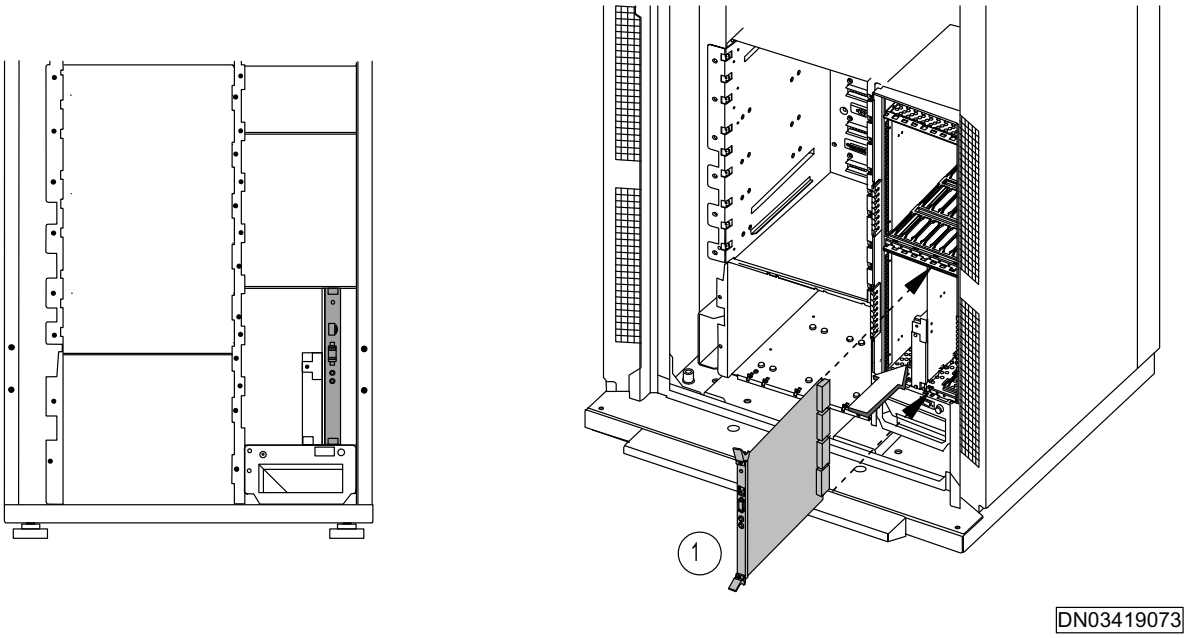
4.5.10 Installing a Wideband AXC-ATM Cross-connect (AXU) unit in UltraSite EDGE BTS with WCDMA upgrade

Before you start

Review the *Overview of installing WCDMA units.* Pay careful attention to all warnings and cautions.

Summary

The cabinet provides one (1) slot for the AXU unit.



1	AXUx

Figure 46. Installing the AXU unit

Steps

1. **Slide the AXU unit into the rack.**
2. **Hold the ejectors in an open position.**
3. **When the AXU unit is in place, close the ejectors.**

   The ejectors fix the unit completely so that the rear connectors are fully engaged.
4. **Tighten the screws on the unit front panel. L**

   Lift the unit to ease the tightening.

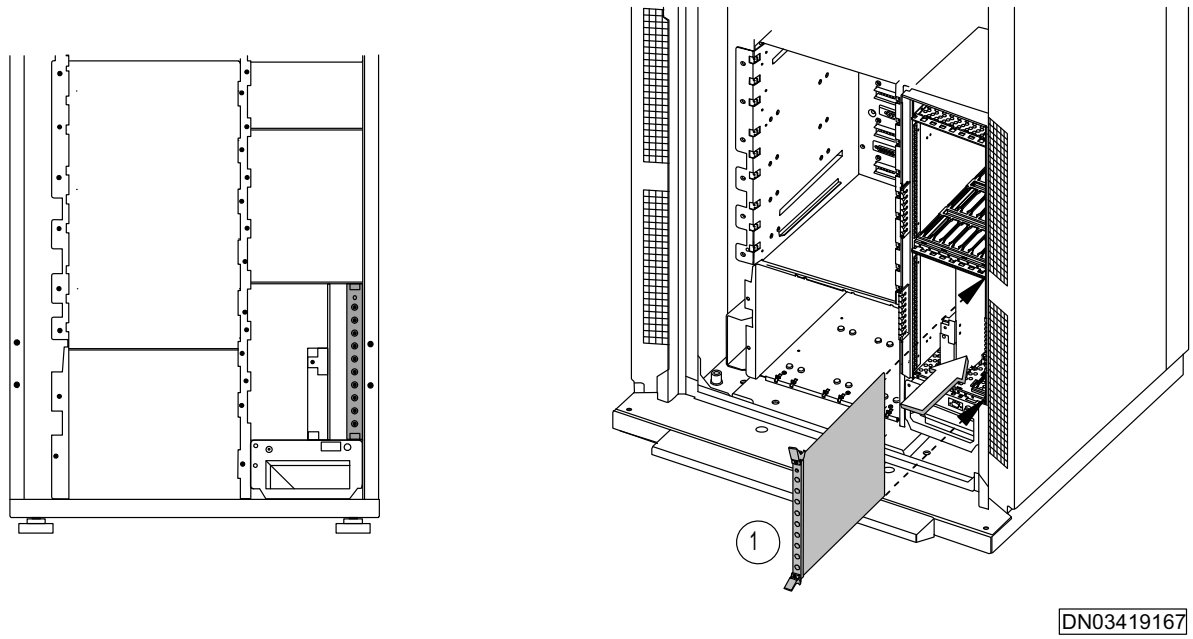
4.5.11 Installing a Wideband Interface (IFU) unit in UltraSite EDGE BTS with WCDMA upgrade

Before you start

Review the *Overview of installing WCDMA units.* Pay careful attention to all warnings and cautions.

Summary

The cabinet provides one (1) slot for the IFU unit.



1	IFUx

Figure 47. Installing the IFU unit

Steps

1. Slide the IFU unit into the rack.

2. Hold the ejectors in an open position.

3. **When the IFU unit is in place, close the ejectors.**

   The ejectors fix the unit completely so that the rear connectors are fully engaged.

4. **Tighten the screws on the unit front panel.**

   Lift the unit to ease the tightening.

4.6 Cabling WCDMA units of UltraSite EDGE BTS

4.6.1 Overview of cabling units of UltraSite EDGE BTS with WCDMA upgrade

Summary

The cable sets are delivered with the units when you order the configuration from the factory. All cables are identified by the cable code and the cable label.

Note

During commissioning, the code and label information can be stored to a file in the BTS.

Steps

1. **Route antenna cables.**
2. **Route TX/RX cables.**
3. **Route transmission cables.**
4. *If* installing heater control in an outdoor cabinet,

   Then

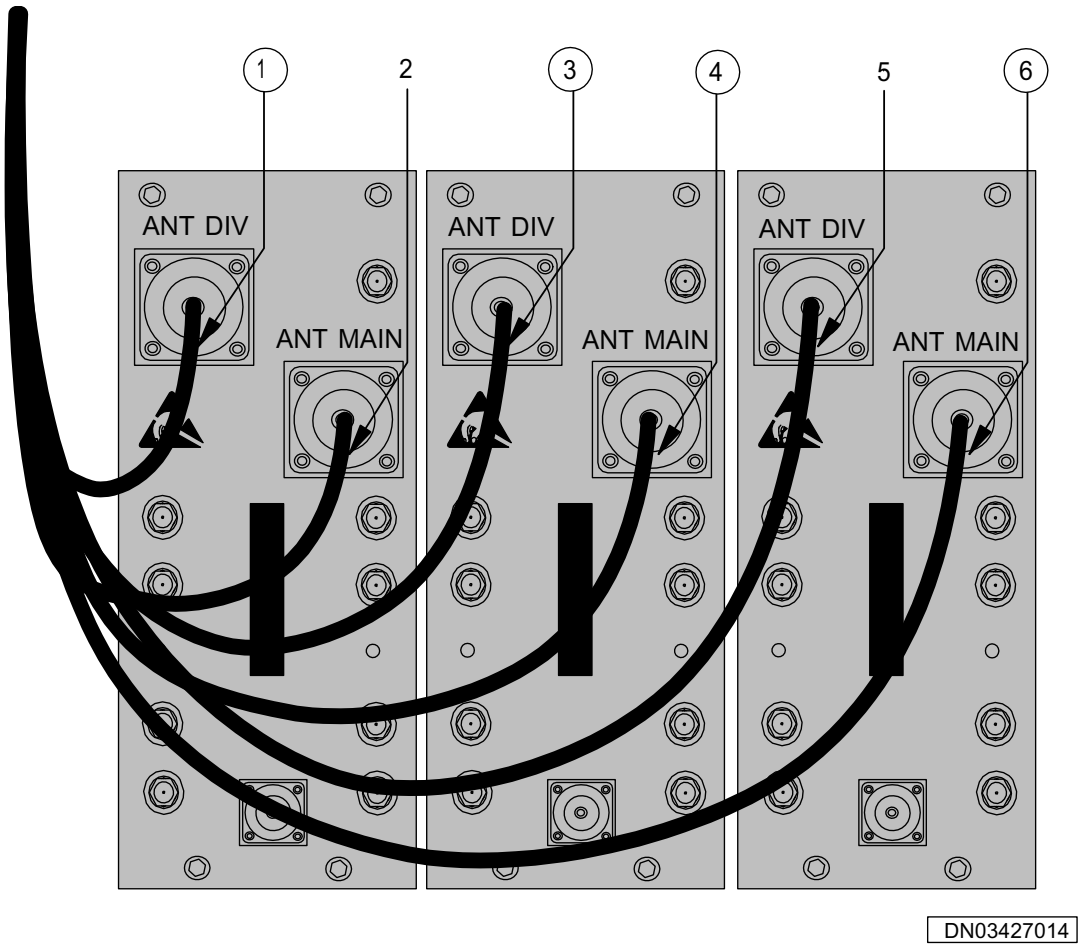
   Follow these instructions.

4.6.2 Cabling antenna connections in UltraSite EDGE BTS with WCDMA upgrade

Before you start

Review the *Overview of cabling units of UltraSite EDGE BTS with WCDMA upgrade*.

Summary



1	DIV 1
2	MAIN 1
3	DIV 2

4	MAIN 2
5	DIV 3
6	MAIN 3

Figure 48. Antenna cables in 1+1+1 or 2+2+2 configuration

Steps

1. **Connect the WCDMA antenna cables to the WAF unit connectors.**
2. **Tighten each antenna cable.**

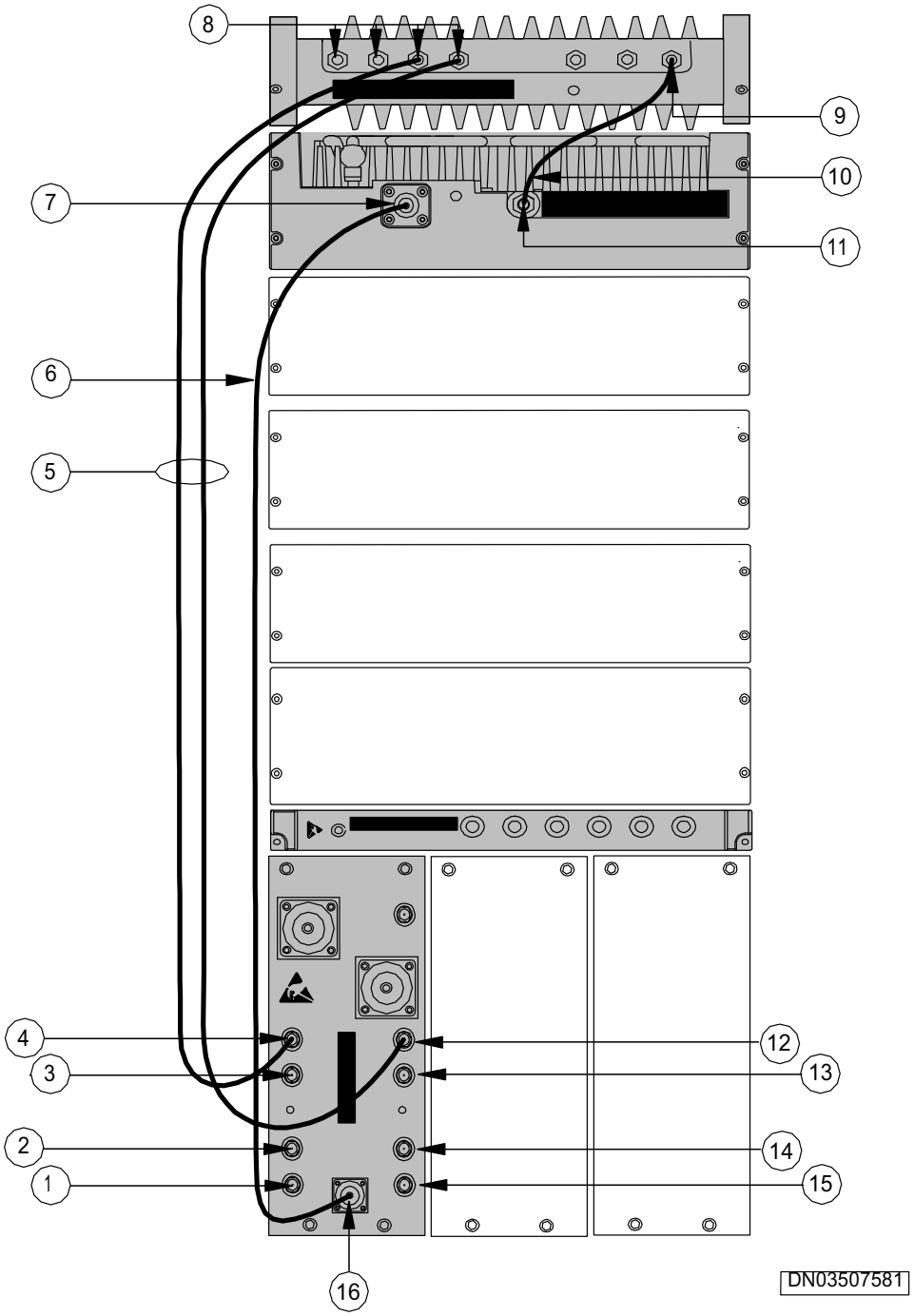
   See *Torque settings of UltraSite EDGE BTS*.

4.6.3 Cabling TX/RX connections in UltraSite EDGE BTS with WCDMA upgrade

Before you start

Review the *Overview of cabling units of UltraSite EDGE BTS with WCDMA upgrade*.

Summary



1	RX DIV4
2	RX DIV3

3	RX DIV2
4	RX DIV1
5	DN994114
6	DN994112
7	RF OUT
8	RXD2, RXM2, RXD1, RXM1
9	TX1
10	DN994117
11	RF IN
12	RX1
13	RX2
14	RX3
15	RX4
16	TX

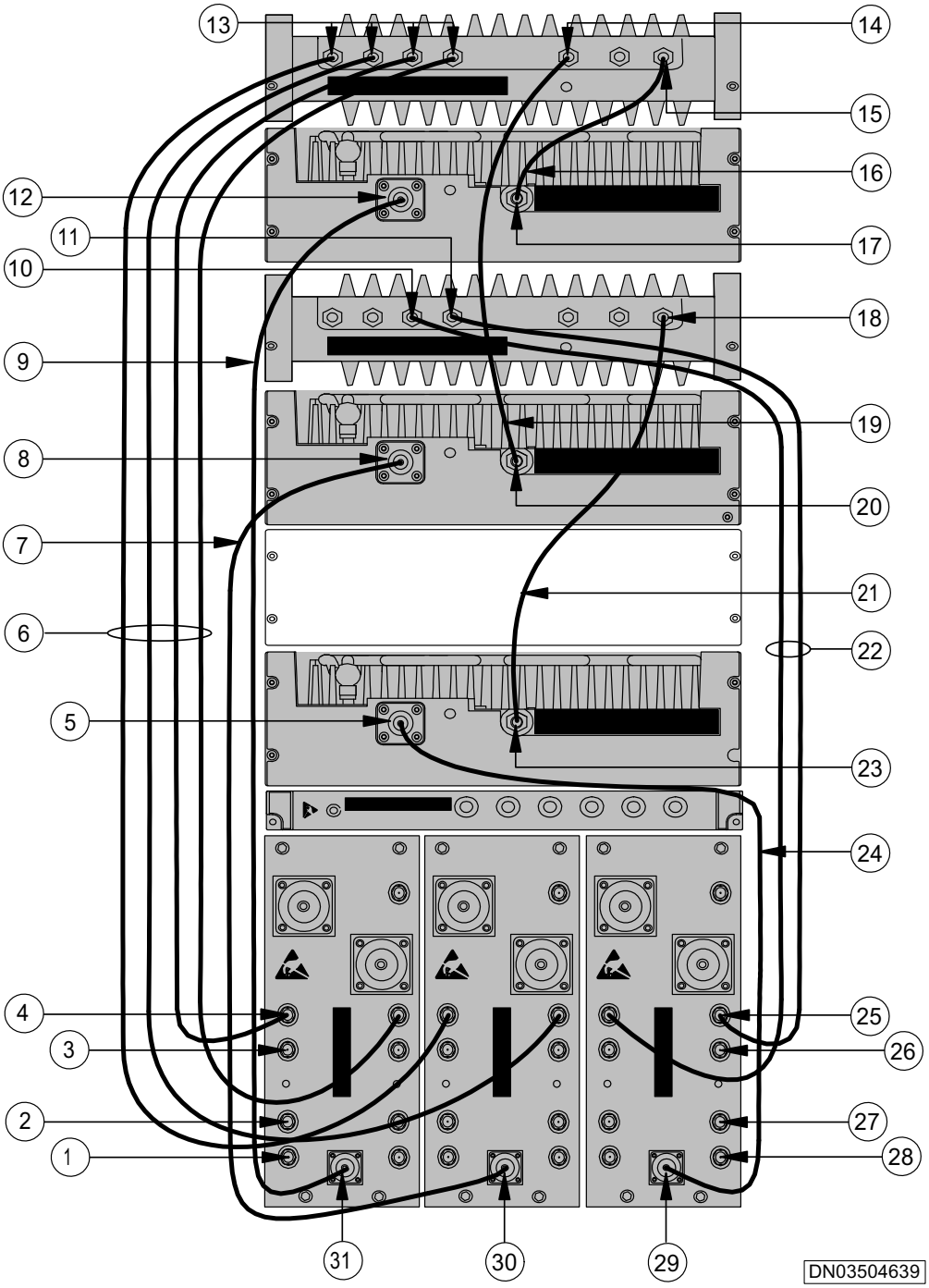
Figure 49. TX and RX cables in 1-carrier omni configuration

Graphic Not Found

1	RX DIV4
2	RX DIV3
3	RX DIV2
4	RX DIV1
5	DN994110
6	RF OUT
7	DN994112
8	DN994114
9	RF OUT
10	RXD2, RXM2, RXD1, RXM1
11	TX2
12	TX1

13	DN994117
14	RF IN
15	DN994264
16	RX1
17	RX2
18	RX3
19	RX4
20	TX
21	TX

Figure 50. TX and RX cables in 1+1 configuration

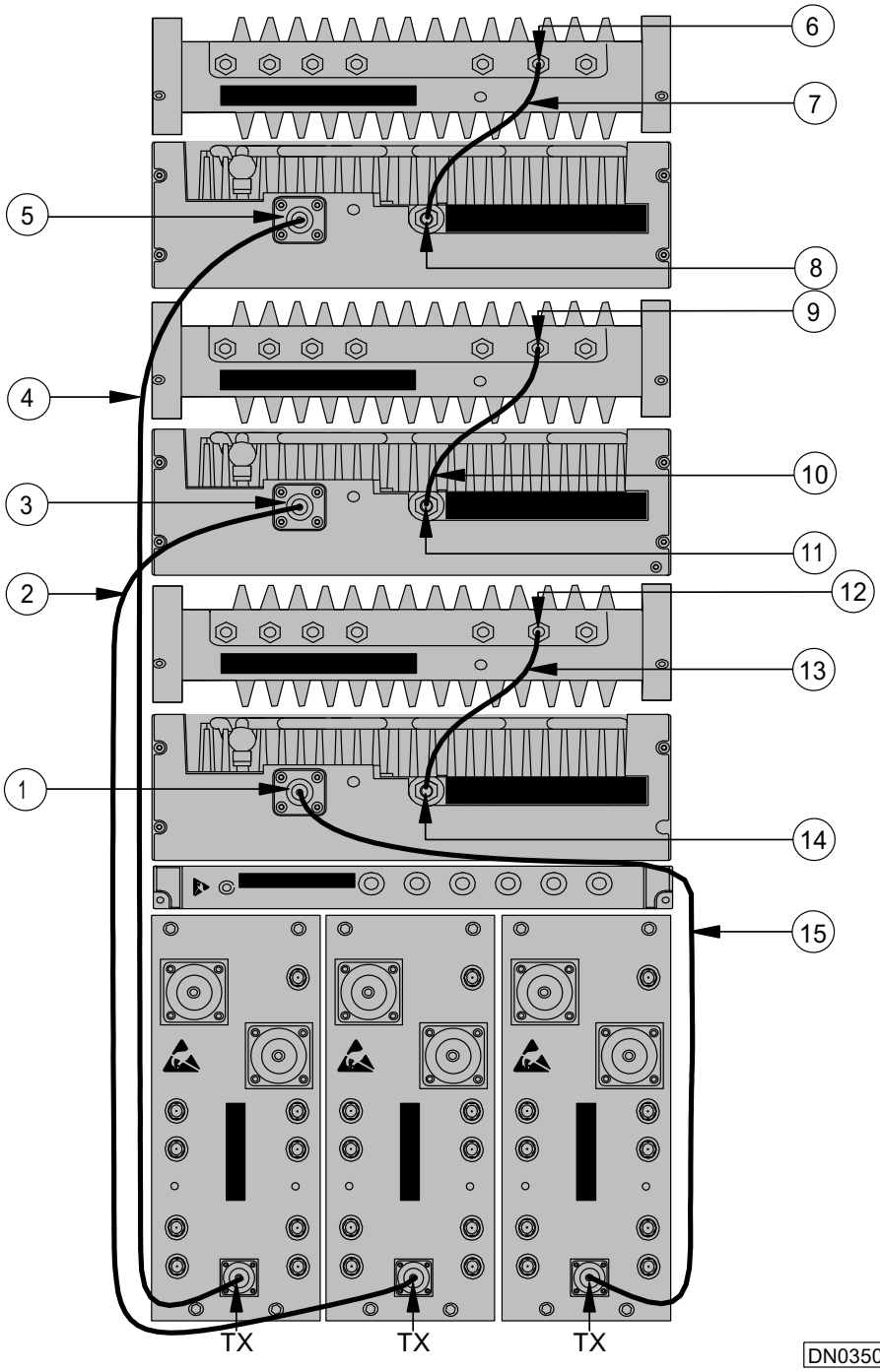


1	RX DIV4

2	RX DIV3
3	RX DIV2
4	RX DIV1
5	RF OUT
6	DN994114
7	DN994110
8	RF OUT
9	DN994112
10	RXD1
11	RSM1
12	RF OUT
13	RXD2, RXM2, RXD1, RXM1
14	TX2
15	TX1
16	DN994117
17	RF IN
18	TX1
19	DN994264
20	RF IN
21	DN994264
22	DN994115
23	RF IN
24	DN994111
25	RX1
26	RX2
27	RX3
28	RX4

29	TX
30	TX
31	TX

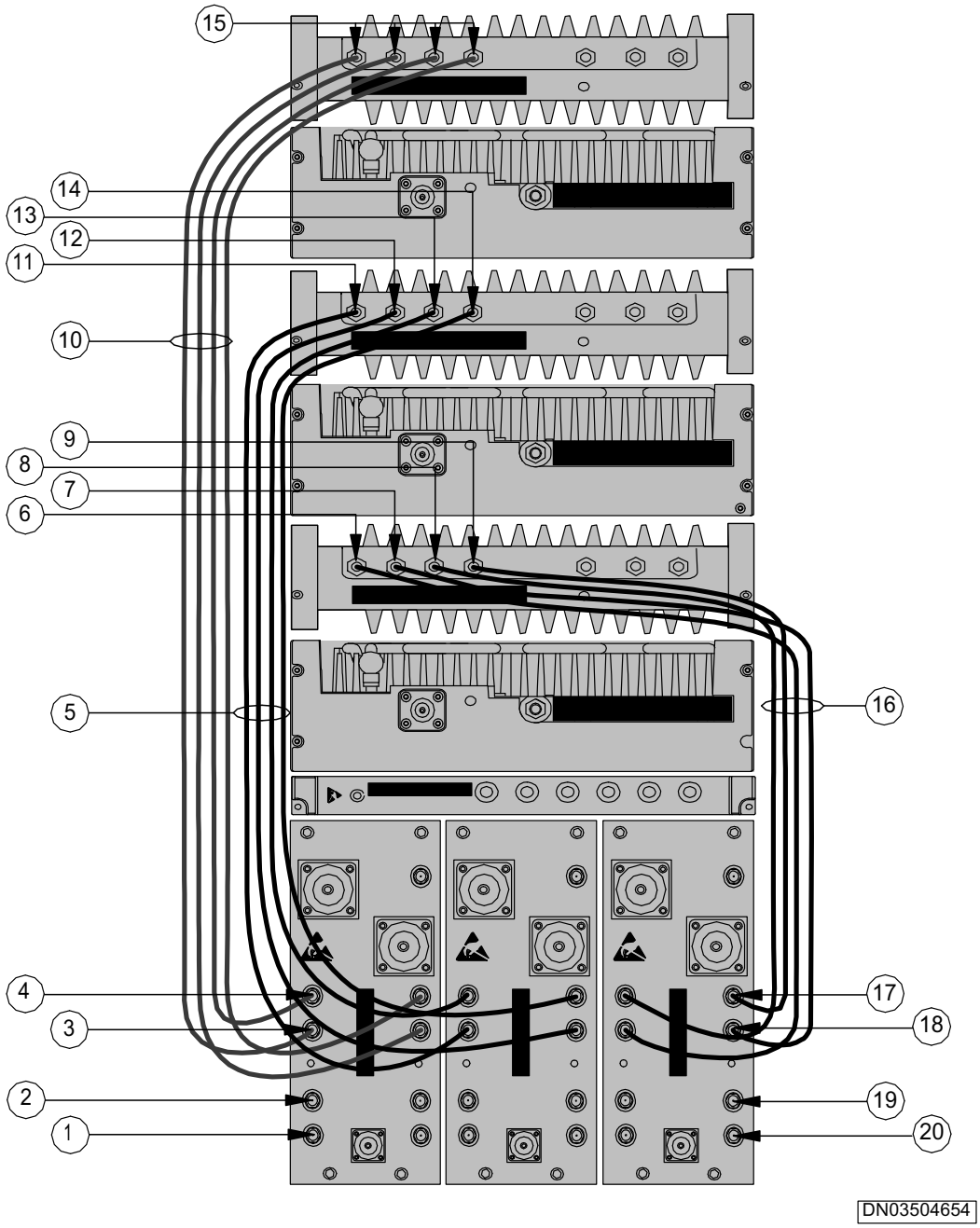
Figure 51. TX and RX cables in 1+1+1 configuration



1	RF OUT

2	DN994110
3	RF OUT
4	DN994112
5	RF OUT
6	SUMTX
7	DN994117
8	RF IN
9	SUMTX
10	DN994117
11	RF IN
12	SUMTX
13	DN994117
14	RF IN
15	DN994111

Figure 52. TX cables in 2+2+2 configuration



1	RX DIV4
2	RX DIV3
3	RX DIV2

4	RX DIV1
5	DN994115
6	RXD2
7	RXM2
8	RXD1
9	RXM1
10	DN994114
11	RXD2
12	RXM2
13	RXD1
14	RXM1
15	RXD2, RXM2, RXD1, RXM1
23	RX1
24	RX2
25	RX3
26	RX4

Figure 53. RX cables in 2+2+2 configuration

Steps

1. Install the TX cables.

a. Connect the TX cables between the WAF and WMP units for the particular sectors as illustrated by *1-carrier omni configuration*, *1+1 configuration*, *1+1+1 configuration*or *2+2+2 configuration*.

b. Tighten the cables.

See *Torque settings of UltraSite EDGE BTS.*

2. Connect the RX cables.

a. Connect the RX cables between the WAF, WMP and WTR units in the desired configuration, as illustrated by *1-carrier omni configuration*, *1+1 configuration*, *1+1+1 configuration*, or *2+2+2 configuration*.
b. Tighten the cables.
   See *Torque settings of UltraSite EDGE BTS.*

4.6.4 Cabling a transmission (VXxx) unit of UltraSite EDGE BTS with WCDMA upgrade

Before you start

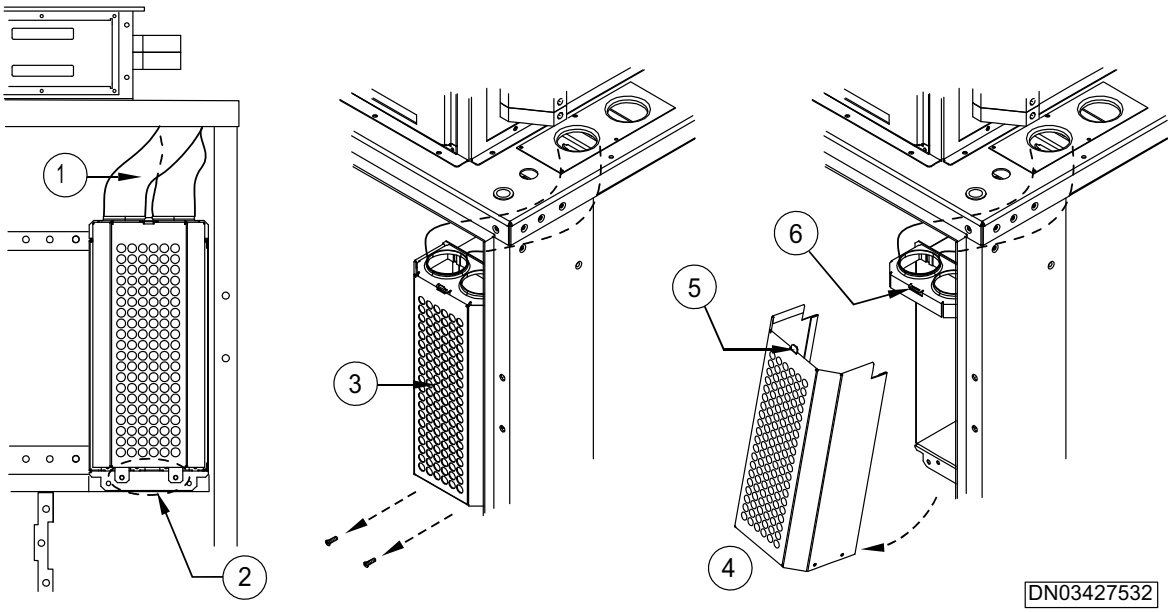
Review the *Overview of cabling units of UltraSite EDGE BTS with WCDMA upgrade*.

Summary

The UltraSite EDGE BTS with WCDMA functionality uses the same VXxx transmission units for both GSM/EGDE and WCDMA transmission. However, the WCDMA transmission requires installing WCDMA transmission cables between the IFU unit in the WCDMA part of the BTS and the VXxx unit in the GSM/EDGE part of the BTS.

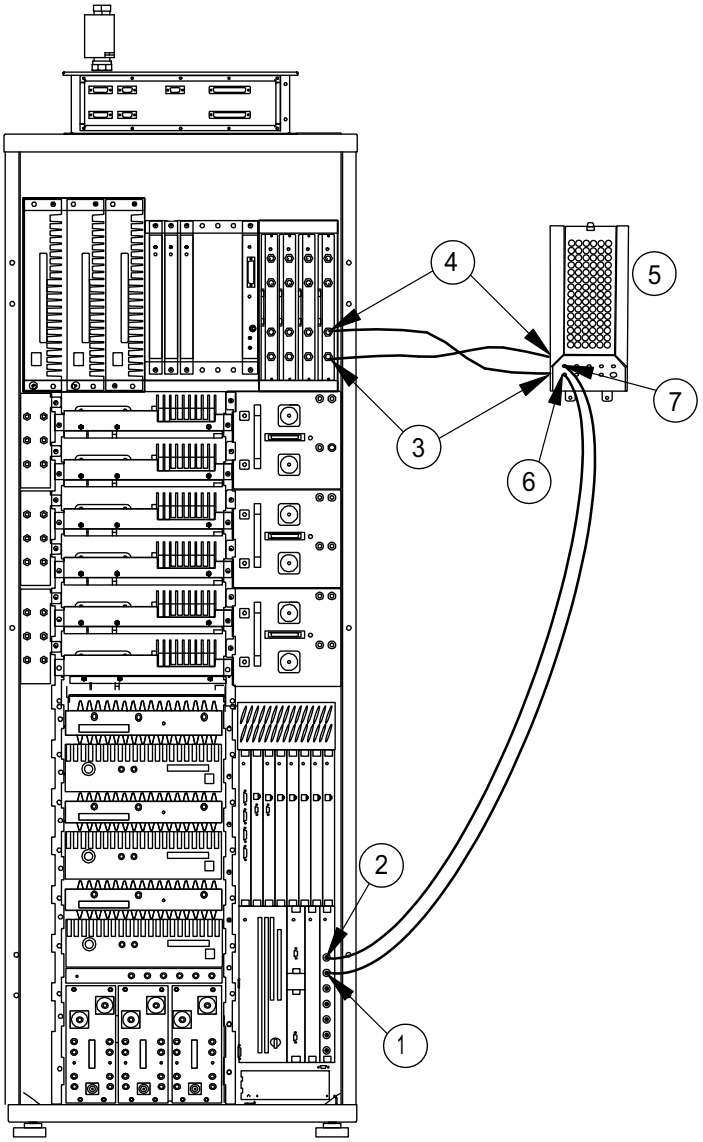
Also, this feature requires a new WCDMA Upgrade Kit Transmission unit cover with different mechanics to allow installing the WCDMA transmission cables. Before routing and installing the WCDMA transmission cables, the existing Transmission unit cover needs to be removed.

Cabinet front view



1	Cable sleeve
2	Screws (2x)
3	Transmission unit cover
4	Transmission unit cover, removed
5	Tab
6	Slot

Figure 54. Transmission unit cover removal



1	RX
2	TX
3	TX
4	RX
5	Transmission unit cover

6	TX
7	RX

Figure 55. Transmission cable connections

Steps

1. Remove the Transmission unit cover.

a. Remove the two screws from the Transmission unit box.

b. Pull the bottom of the Transmission unit cover out from the Transmission unit box, while pulling down to disengage the tab and remove the cover.

2. Install the transmission cables and WCDMA Upgrade Kit Transmission unit cover.

a. Depending on the desired WCDMA configuration and on the existing GSM/EDGE configuration, install as many additional FXC transmission units (VXxx) as required. For more information, see *Overview of installing GSM/EDGE units of UltraSite EDGE BTS*.

b. Check the VXxx unit cross-connections with Nokia BTS Manager to see which VXxx unit RX and TX connectors are available for connection to the IFU unit in the WCDMA section of the BTS.

c. Depending on the type of the IFU unit in the WCDMA configuration, connect the transmission cables between the VXxx, the WCDMA Upgrade Kit Transmission unit cover and the IFU unit as listed in the tables below.

Note

To ease connecting cables, hang the WCDMA Upgrade Kit Transmission unit cover from its hook to the common rack.

Note

The connections in the tables are examples of how to connect the transmission cables to the TX and RX connectors. The VXxx and IFUx connections may vary depending on the actual WCDMA BTS configuration.

Note

Nokia recommends that you use eight first connectors (TX1 and RX1 to TX4 and RX4) to make transmission cable connections.

Table 9. Transmission cable connections to 75Ω IFUD unit

IFUD connector	WCDMA Upgrade Kit Transmission unit cover connector	VXxx connector
TX1	TX1	IF1 RX1
RX1	RX1	IF1 TX1
TX2	TX2	IF2 RX2
RX2	RX2	IF2 TX2
TX3	TX3	IF3 RX3
RX3	RX3	IF3 TX3
TX4	TX4	IF4 RX4
RX4	RX4	IF4 TX4

Table 10. Transmission cable connections to 120 Ω IFUA unit

IFUA connector	WCDMA Upgrade Kit Transmission unit cover connector	VXxx connector
IF1	TX/RX1	IF1
IF2	TX/RX2	IF2
IF3	TX/RX3	IF3
IF4	TX/RX4	IF4

d. Install the Transmission unit cover on the Transmission unit box.

e. Insert the two screws to the Transmission unit cover and tighten them until the cover is flush on the Transmission unit box.

   See *Torque settings of UltraSite EDGE BTS.*

f. Insert the cables to the cable block in the BB rack.

5 Glossary

5.1 Glossary for UltraSite EDGE BTS

5.1.1 Abbreviations and acronyms

This section lists abbreviations and acronyms used throughout Nokia UltraSite EDGE Solution documentation.

AC	Alternating Current
ACFU	AC Filter Unit
A/D	Analog/Digital
ADC	Analog to Digital Converter
ADUA	AC/DC control and distribution unit for Integrated Battery Backup (IBBU)
AGC	Automatic Gain Control
ALS	Automatic Laser Shutdown
AMR	Adaptive Multi-Rate coding
ANSI	American National Standards Institute
ANT	Antenna connector
ARFN	Absolute Radio Frequency Channel Number
ASIC	Application Specific Integrated Circuit
ATM	Asynchronous Transfer Mode

AWG	American Wire Gauge
AXC	ATM cross-connect
AXU	ATM cross-connect unit
BAPT	Bundesamt für Post und Telekommunikation Telecommunications advisory agency of Federal Republic of Germany
BATx	Rectifier for battery backup
BBAG	12 V battery for Integrated Battery Backup (IBBU)
BB2x	Transceiver Baseband unit • BB2A for GSM • BB2E for GSM/EDGE
BCCH	Broadcast Control Channel
BCF	Base Control Function
BER	Bit Error Ratio The ratio of the number of bit errors to the total number of bits transmitted in a given time interval.
BIST	Built-In Self Test A technique that provides a circuit the capability to carry out an implicit test of itself.
BOIx	Base Operations and Interfaces unit
BPxN	Bias Tee without VSWR monitoring • BPDN for GSM 900/1800/1900 • BPxV Bias Tee with VSWR monitoring • BPGV for GSM 900 • BPDV for GSM 1800/1900
BS	British Standards
BSC	Base Station Controller

BSS	Base Station Subsystem
BTS	Base Transceiver Station (Base Station)
CC	Cross-Connection
CCCH	Common Control Channel
CCITT	Comité Consultatif International Télégraphique et Téléphonique International Telegraph and Telephone Consultative Committee (Telecommunications advisory agency of France)
CCUA	Cabinet Control Unit
CDMA	Code Division Multiple Access A technique in which the radio transmissions using the same frequency band are coded in a way that a signal from a certain transmitter can be received only by certain receivers
CE	Cable Entry; Consumer Electronics; Conformit Européen (European Conformity) CH Channel
CHDSP	Channel Digital Signal Processor
CN	Change Note A short trouble management document in a specified form sent to a customer about a modification in a product
CRC	Cyclic Redundancy Check A method for detecting errors in data transmission.
CRMx	Core Mechanics for Nokia UltraSite EDGE Base Station Indoor and Outdoor cabinet • CRMA for Indoor and Outdoor cabinets • CRMB for Site Support cabinets • CRMC for Midi Indoor and Outdoor cabinets
CSC	Customer Services Centre
D/A	Digital/Analog

DC	Direct Current
DCS	Digital Cellular System
DDS	Direct Digital Synthesis The frequency synthesis in which logic and memory are used to digitally construct the desired output signal, and a digital-to-analogue converter is used.
DL	(Downlink) The direction of transmission in which the BTS is the transmitting facility and the mobile station is the receiving facility.
DIP	Dual In-line Package
DRAM	Dynamic Random Access Memory
DRX	Discontinuous Reception
DSP	Digital Signal Processor
DTX	Discontinuous Transmission
DU2A	Dual Band Diplex Filter unit for GSM 900/1800
DVxx	Dual Variable Gain Duplex Filter unit • DVTB for GSM/EDGE 800 • DVTC for GSM/EDGE 800 co-siting • DVGA for GSM/EDGE 900 • DVHA for GSM/EDGE 900 customer-specific H band • DVJA for GSM/EDGE 900 customer-specific J band • DVDC for GSM/EDGE 1800 • DVDA for GSM/EDGE 1800 A band • DVDB for GSM/EDGE 1800 B band • DVPA for GSM/EDGE 1900
E1	European Digital Transmission Format Standard (2.048 Mbit/s)
EAC	External Alarms and Controsl

EC	European Community
EDGE	Enhanced Data rates for Global Evolution
EEC	European Economic Community
EEPROM	Electronically Erasable Programmable Read Only Memory
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
EMP	Electromagnetic Pulse
EN	European Norm
EQDSP	Equaliser Digital Signal Processor
ESD	Electrostatic Discharge
ET	Exchange Terminal
ETSI	European Telecommunications Standards Institute
Ext.	External
FACCH	Fast Associated Control Channel
FACH	Forward Access Channel
FCC	Federal Communications Commission The United States federal agency responsible for the regulation of interstate and international communications by radio, television, wire, satellite, and cable.
FC E1/T1	Wireline transmission unit (75 [ohm] E1, 120 [ohm] E1, or 100 [ohm] T1) of Nokia UltraSite EDGE Base Station without cross-connection capability.
FCLK	Frame Clock
FET	Field Effect Transistor
FHS	Frequency Hopping Synthesiser

FIFP	Forwarded Intermediate Frequency Power
FIKA	+24 VDC Installation Kit
FPGA	Field Programmable Gate Array
FXC E1	Wireline transmission unit (75 [ohm] E1) with four line interfaces to the 2 Mbit/s (E1) transmission line; cross-connection capability at 8 kbit/s level.
FXC E1/T1	Wireline transmission unit (120 [ohm] E1 or 100 [ohm] T1) with four line interfaces to the 2 Mbit/s (E1) or 1.5 Mbit/s (T1) transmission line; cross-connection capability at 8 kbit/s level.
FXC RRI	Radio link transmission unit (radio indoor unit) with cross-connection capability at 8 kbit/s level. Used with MetroHopper Radio and FlexiHopper Microwave Radio.
Gb	Interface between RNC and SGSN
GMSK	Gaussian Minimum Shift Keying
GND	Ground; Grounding (protective earthing). See Grounding and PE.
GPRS	General Packet Radio Service
GSM	Global System for Mobile communications • GSM 800 GSM 800 MHz frequency band • GSM 900 GSM 900 MHz frequency band • GSM 1800 GSM 1800 MHz frequency band • GSM 1900 GSM 1900 MHz frequency band
GUI	Graphical User Interface
HDLC	High-level Data Link Control
HETA	Base station cabinet heater
HO	Handover

	The action of switching a call in progress from one radio channel to another, to secure the continuity of the established call
HSCSD	High-Speed Circuit Switched Data
HV	High Voltage
HW	Hardware Specfically, electronic equipment supporting data transmission and processing tasks, and the electrical and mechanical devices related to their operation
IAKx	Indoor Application Kit for Nokia UltraSite EDGE Base Station • IAKA for UltraSite Indoor cabinet • IAKC for UltraSite Midi Indoor cabinet
IBBU	Integrated Battery Backup
IC	Integrated Cell
ICE	Intelligent Coverage Enhancement
ID	Identification; Identifier IE Information Element The basic unit of a transaction capabilities application part (TCAP) message.
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Inc.
IF	Intermediate Frequency
IFM	Interface Module
IFU	Interface unit
ILKA	Indoor Lock Kit
ILMT	Integrated Local Management Tool

IMA	Inverse Multiplexed ATM
IP	Ingress Protection
IRPA	International Radiation Protection Association
ISDN	Integrated Services Digital Network
ISHO	Inter-system handover The handover from one system to another.
ISO	International Organization for Standardization
ITU	International Telecommunication Union
L2	AC Phase 2
L3	AC Phase 3
Iu	The interconnection point between the RNC and the Core Network
Iub	Interface between the RNC and node B
Iubis	Interface between the RNC and the BTS
Iur	The logical interface for the interconnection of two radio network controller (RNC) components of the UMTS terrestrial radio access network (UTRAN) system
JIS	Japanese Industrial Standard
LAN	Local Area Network A data transmission network covering a small area.
LAPD	Link Access Protocol on D-channel between the BSC and BTS
LED	Light Emitting Diode
LMB	Local Management Bus
LMP	Local Management Port

LNA	Low-Noise Amplifier
LO	Local Oscillator
LTE	Line Terminal Equipment
LV	Low Voltage
LVD	Low Voltage Disconnect
LVDS	Low Voltage Differential Signalling
LVTTL	Low Voltage Transistor Transistor Logic
M2xA	2-way Receiver Multicoupler unit • M2LA for GSM/EDGE 800/900 • M2HA for GSM/EDGE 1800/1900 • M6xA 6-way Receiver Multicoupler unit • M6LA for GSM/EDGE 800/900 • M6HA for GSM/EDGE 1800/1900
MAC	Medium Access Control function, handles the channel allocation and multiplexing, that is, the use of physical layer functions.
MCLG	Master Clock Generator
MDF	Main Distribution Frame
MHA	Masthead Amplifier
MMI	Man-Machine Interface
MML	Man-Machine Language A text-based command language with a standardised structure, designed to facilitate direct user control of a system.
MNxx	Masthead Amplifier specific to Nokia UltraSite EDGE Base Station • MNGA for GSM/EDGE 800/900 • MNDA for GSM/EDGE 1800 A band • MNDB for GSM/EDGE 1800 B band

- MNPA for GSM/EDGE 1900 A band
- MNPB for GSM/EDGE 1900 B band
- MNPC for GSM/EDGE 1900 C band

MPT — Ministry of Posts and Telecommunications

Telecommunications regulatory agency of Great Britain.

MS — Mobile Station

User equipment which uses a radio connection, and which can be used in motion or at unspecified points. This is usually a mobile phone.

MSC — Mobile Switching Centre

The mobile network element which performs the switching functions in its area of operation, and controls cooperation with other networks.

MTBF — Mean Time Between Failure

NCRP — National Council on Radiation Protection and Measurements

NCU — Node Control Unit

NEBS — Network Equipment Building Systems

NED — Nokia Electronic Documentation

NMS — Network Management System

O&M — Operation and Maintenance

OAKB — Cable entry kit for BTS co-siting

OAKx — Outdoor Application Kit for Nokia UltraSite EDGE Base Station

- OAKA for UltraSite Outdoor cabinet
- OAKC for UltraSite Midi Outdoor cabinet
- OAKD for UltraSite Midi Outdoor to Talk-family Co-siting

OBKA — Outdoor Bridge Kit

OCXO	Oven Controlled Crystal Oscillator An oscillator in which the crystal and critical circuits are temperature-controlled by an oven.
OEKA	Outdoor (cable) Entry Kit
OFKA	Outdoor Air Filter Kit
OFKC	MIDI Outdoor Air Filter Kit
OMU	Operation and Maintenance Unit
OMUSIG	OMU Signalling
OVP	Over-Voltage Protection
PC	Personal Computer
PCB	Printed Circuit Board
PCM	Pulse Code Modulation
PE	Protective earthing (grounding) See GND and Grounding.
PFC	Power Factor Correction
PLL	Phase-Locked Loop
Point-to-point	Transmission between two fixed points
PSM	Power System Management
PWM	Pulse Width Modulation
PWSx	AC/DC Power Supply unit • PWSA for 230 VAC input • PWSB for -48 VDC input • PWSC for +24 VDC input
Q1	Nokia proprietary transmission management protocol

RACH	Random Access Channel
RAKE	A receiver capable of receiving and combining multipath signals
RAM	Random Access Memory
RAN	Radio Access Network A third generation network that provides mobile access to a number of core networks of both mobile and fixed origin.
RCD	Residual Current Device
RF	Radio Frequency
RFF	Radio Frequency Fingerprinting
RIFP	Reflected Intermediate Frequency Power
RLE	Radio Link Equipment
RNC	Radio Network Controller The network element in a radio access network which is in charge of the use and the integrity of radio resources.
ROM	Read Only Memory
RRI	Radio Relay Interface
RSSI	Received Signal Strength Indicator
RTC	Remote Tune Combining
RTxx	Remote Tune Combiner • RTGA for GSM/EDGE 900 • RTHA for GSM/EDGE 900 H band • RTJA for GSM/EDGE 900 J band • RTDC for GSM/EDGE 1800 • RTDA for GSM/EDGE 1800 A band • RTDB for GSM/EDGE 1800 B band • RTPA for GSM/EDGE 1900

RTN	Return
RX	Receiver; Receive
SCF	Site Configuration File
SCT	Site Configuration Tool
SDCCH	Stand-alone Dedicated Control Channel
SDH	Synchronous Digital Hierarchy
SMB	Sub-Miniature B Connector
SMS	Short Message Service
SSS	Site Support System
STM	Synchronous Transport Module
STM-1	Synchronous Transport Module (155 Mbit/s)
SW	Software
Sync	Synchronization The process of adjusting corresponding significant instances of signals, in order to obtain the desired phase relationship between these instances.
T1	North American Digital Transmission Format Standard (1.544 Mbit/s)
TC	Transcoder
TCH	Traffic Channel The logical radio channel that is assigned to a base transceiver station and is primarily intended for conversation.
TCP/IP	Transport Control Protocol/Internet Protocol
TCS	Temperature Control System
TDMA	Time Division Multiple Access

TE	Terminal Equipment Equipment that provides the functions necessary for user operation of the access protocols.
TMS	Transmission Management System The network system for managing equipment settings, and for centralised retrieval of statistics and alarm information from transmission equipment connected to the system.
TS	Time Slot A cyclic time interval that can be recognised and given a unique definition.
TRE	Transmission Equipment
TRX	Transceiver
TRXSIG	TRX Signalling
TS	Time Slot
TSxx	Transceiver (RF unit), specific to Nokia UltraSite EDGE Base Station • TSTB for GSM/EDGE 800 • TSGA for GSM 900 • TSGB for GSM/EDGE 900 • TSDA for GSM 1800 • TSDB for GSM/EDGE 1800 • TSPA for GSM 1900 • TSPB for GSM/EDGE 1900
TTL	Transistor Transistor Logic
TX	Transmitter; Transmit
UC	Unit Controller
UI	User Interface
UL	Underwriters Laboratories

UL (Uplink) The direction of transmission in which the mobile station is the transmitting facility and the BTS is the receiving facility.

- 2-way uplink diversity - The function by which a BTS uses two antennas and two receivers simultaneously on a single channel to obtain improved overall BTS receiver sensitivity in an environment that is subject to random multipath fading.
- 4-way uplink diversity - The function by which a BTS uses four antennas and four receivers simultaneously on a single channel to obtain improved overall BTS receiver sensitivity in an environment that is subject to random multipath fading.

UMTS Universal Mobile Telecommunications System

UTRAN / UMTS
Terrestrial Radio Access Network

A radio access network (RAN) consisting of radio network controllers (RNCs) and base transceiver stations (BTSs). It is located between the Iu interface and the wideband code division multiple access (WCDMA) radio interface.

UPS Uninterruptible Power Supply

VC Virtual Channel

VCO Voltage Controlled Oscillator

An oscillator for which a change in tuning voltage results in a predetermined change in output frequency.

VLL Line-to-Line Voltage

VP Virtual Path

The unidirectional transport of ATM cells belonging to virtual channels that are associated by a common identifier value.

VPCI Virtual Path Connection Identifier

An identifier which identifies the virtual path connection between two B-ISDN ATM exchanges, or between a B-ISDN ATM exchange and a B-ISDN user.

VPI — Virtual Path Identifier

An identifier which identifies a group of virtual channel links at a given reference point that share the same virtual path connection.

VSWR — Voltage Standing Wave Ratio

The ratio of maximum to minimum voltage in the standing wave pattern that appears along a transmission line. It is used as a measure of impedance mismatch between the transmission line and its load.

VXxx — Transmission unit, specific to Nokia UltraSite EDGE Base Station

- VXEA for FC E1/T1
- VXRA for FC RRI
- VXRB for FXC RRI
- VXTA for FXC E1
- VXTB for FXC E1/T1

WAF — Wideband Antenna Filter unit

WAM

Wideband Application Manager unit

WBC — Wideband Combining unit

WCC — Wideband Cabinet Core

WCDMA — Wide band Code Division Multiple Access

A spread spectrum CDMA technique used to increase the capacity and coverage of wireless communication networks.

WCH — Wideband Cabinet Heater

WCxA — Wideband Combiner, specific to Nokia UltraSite EDGE Base Station

- WCGA for GSM/EDGE 800/900
- WCDA for GSM/EDGE 1800
- WCPA for GSM/EDGE 1900

WEK	Wideband Extension Kit
WFA	Wideband Fan
WHX	Wideband Heat Exchanger
WIC	Wideband Input Combiner
WIK	Wideband Indoor Kit
WOC	Wideband Output Combiner
WOK	Wideband Outdoor Kit
WPA	Wideband Power Amplifier unit
WPS	Wideband Power Supply unit
WSC	Wideband System Clock
WSM	Wideband Summing and Multiplexing unit
WSP	Wideband Signal Processor unit
WTR	Wideband Transmitter and Receiver

5.1.2 Terms

This section provides definitions for terms used throughout Nokia UltraSite Solution documentation.

Abis Interface
: Interface between a Base Transceiver Station (BTS) and the Base Station Controller (BSC) and between two BTSs.

Absolute radio frequency channel number
: See absolute radio frequency number.

Absolute radio frequency number; absolute radio frequency channel number; ARFN; ARFCN
: Radio frequency used in connection with, for example, mobile originating and terminating test calls.

Adaptive multi-rate speech codec; AMR speech codec; AMR codec; AMR
: Speech codec which adapts its operation optimally according to the prevailing channel conditions.

Air Interface — Interface between MS and BTS.

Alarm — Announcement given to the operating personnel about abnormal functioning of the system or about a failure, or an indication of the degradation of the service level or reliability.

Alarm Status — Classification of the severity of an alarm, such as Critical, Major, Minor, and Information.

Alternating current; AC
A periodic current having a mean value zero.

Analogue-to-digital converter; Analog-to-digital converter /US/; A/D converter; ADC
A device which converts an analogue input signal to a digital output signal carrying equivalent information.

Application-specific integrated circuit; custom circuit; custom IC; ASIC
Integrated circuit which is designed for a specific application and a specific customer and which is not available to other customers.

ATM connection control; connection control; CC
Function that keeps track of connection resources and based on those handles the operations related to different kind of cross-connections.

ATM inverse multiplexing
See inverse multiplexing for ATM.

Backplane — Connector board at the back of Nokia UltraSite cabinets to which plug-in units are directly connected. See also BATA backplane and RFU backplane.

Base station — See base transceiver station.

Base station controller; BSC
Network element in the public land mobile network (PLMN) for controlling one or more base transceiver stations (BTS) in the call set-up functions, in signalling, in the use of radio channels and in various maintenance tasks.

Base station system; BSS
System of base stations (BSs) and base station controllers which is viewed by the mobile services switching centre (MSC) through a single interface.

Base transceiver station; base station; BTS; BS
: Network element in a mobile network responsible for radio transmission and reception to or from the mobile station.

BATA backplane
: Additional backplane required in a Site Support cabinet when using 12 rectifiers.

Bias Tee
: Unit that provides DC power for an associated MHA unit.

Cabinet Control Unit
: Module of the ADUA or ADUB that manages battery control, climatic control, alarm reporting, and serial and version number reporting for the IBBU or Nokia UltraSite Support cabinet. The CCU connects to the BOIx with Q1-bus.

Cell
: Coverage area of a given BTS where transmission is acceptably received.

Cell breathing
: Variation of the cell coverage area; depends on the interference and power requirements.

Cellular Network
: Two or more base stations connected together to provide an area of coverage for Mobile Stations (MS).

CENELEC
: Comité European de Normalisation ELECtrotechnique. European Committee for Electrotechnical Standardization.

Chain Connection
: Transmission solution in which the BTSs are interconnected through a chain, and the first BTS in the chain is connected to the BSC. See Loop Connection, Multidrop Connection, and Star Connection.

Chip
: Signal element.

Chip rate
: Number of chips transmitted in one second.

Commissioning
: Tasks performed to enable the BTS to be connected to the network. Includes operational tests and configuring of the transmission equipment.

Coverage Area
: See Cell.

Cross-connection
: Connection between input and output ports of a network element.

Cross-connection bank
: Information base that defines the cross-connections of a network element. The network element contains two or more banks, one of which is always active.

Custom circuit
: See application-specific integrated circuit.

Custom IC
: See application-specific integrated circuit.

D-bus
: Bus used for traffic communication between the transmission units and BB2x units (D1-bus) and for internal O&M communication with the BOIx, BB2x, and RTxx units (D2-bus).

Despreading
: The received wideband signal is modulated with the spreading code to get a narrowband signal after the multipath propagation in spread spectrum systems.

Digital signal processor; DSP
: A processor designed for signal handling, resembling an ordinary microprocessor.

Discontinuous reception; DRX
: Means of saving battery power (for example in hand-portable units) by periodically and automatically switching the mobile station receiver on and off.

Discontinuous transmission; DTX
: Feature which enables saving battery power (for example in hand-portable units) and reducing interference by automatically switching the transmitter off when no speech or data are to be sent.

Downlink Diversity
: See Frequency Hopping.

Earthing
: See Grounding.

F-bus
: Frequency Hopping bus. See Frequency Hopping.

Finger; rake finger; RAKE finger
: Receiver unit that despreads one multipath signal.

Four-way uplink diversity; 4-way uplink diversity
: Function by which a base transceiver station (BTS) uses four antennas and four receivers simultaneously on a single channel to obtain improved overall BTS receiver sensitivity in an environment that is subject to random multipath fading.

Forward link
: See downlink.

Flash memory
: Nonvolatile, electronically writable memory, similar to EEPROM in function, but which must be erased in blocks.

Flexbus
: Bidirectional coaxial cable that carries up to 16 x 2 Mbit/s signals and power between transmission equipment, such as a radio outdoor and indoor unit.

Frequency-change oscillator
: See local oscillator.

Frequency Hopping
: Function in which a BTS swaps two transmitters on a single channel to obtain improved overall MS receiver sensitivity in a system that is subject to random fading.

Gain
: Signal amplification, expressed in dBi—decibels over a theoretic, isotropic, and uniformly radiating antenna.

Grounding
: Protecting the equipment and the users against lightning and surges through the external connections.

I^2C-bus
: Integrated Inter Cell communication bus used for polling, autodetection, version and serial number management, temperature polling, and alarm collection in units without a microprocessor.

Handover
: The handover occurs between two cells; the signal goes through one base station or base station sector at a time.

Human-machine interface; man-machine interface; HMI; MMI
: A subsystem or function which provides user interface functions in a man-machine language.

Installation
: Tasks performed to enable the BTS to be mounted at the site.

Integration
: Tasks performed to make the BTS functional in the cellular network. Includes making test calls.

Inter-frequency handover
: Handover where the new carrier frequency is different from the current one.

Inter-system handover
: Handover from one system to another, e.g. between a 3rd generation system and GSM.

Inverse multiplexing for ATM; ATM inverse multiplexing; inverse multiplexing; IMA
: The transmission method in which ATM cells in a cell stream are divided across several physical E1 links on a cell-by-cell basis, and then reassembled at the receiving end without affecting the original cell order.

Loop connection
: Transmission solution in which BTSs are interconnected in a loop. For example, the first and last BTSs are connected to the BSC. See Chain Connection, Multidrop Connection, and Star Connection.

Macrocellular
: Application that covers large areas with a cell radius of 1 to 10 km (0.6 to 6 miles). The coverage area is achieved when the antenna is installed high and off the ground.

Maximum ratio combining
: A signal combining technique in which each signal is multiplied by a weight factor that is proportional to the signal amplitude: the strong signals are further amplified, while the weak signals are attenuated.

Microcellular
: Application that typically covers areas with a cell radius of 100 m to 1 km (327 feet to 0.6 miles). The antennas are installed below rooftop level.

Microwave radio
: Radio equipment for establishing an aligned and fixed radio connection between two points.

Midi
: Indoor or Outdoor cabinet with up to six TRXs.

Multidrop Connection
: Transmission solution in which one or more BTS chains are connected to one BTS that is connected to the BSC. See Chain Connection, Loop Connection, and Star Connection.

Network Element

Any equipment that can be managed, monitored, or controlled in a telecommunications network.

Network Topology

Method of transmission between the cells of a network. Examples of transmission solutions are chain, loop, multidrop, and star connections.

Node Manager

A feature of Power System Management (PSM), the Node Manager software called PSMMan is used to control network elements, or nodes, of the Site Support System.

Nokia FlexiHopper

Nokia family of Flexbus-compatible microwave radios for the 13, 15, 18, 23, 26, and 38 GHz frequency bands, in which the radio transmission capacity can be selected using software. The radio transmission capacity of Nokia FlexiHopper can be 2 x 2, 4 x 2, 8 x 2, or 16 x 2 Mbit/s.

Nokia FlexiHopper outdoor unit can be used with different indoor units: FIU 19, RRIC, FC RRI, and FXC RRI.

Nokia Hopper Manager

PC software application used for controlling and monitoring Nokia FlexiHopper and Nokia MetroHopper radios connected to FIU19 or RRIC indoor units.

Nokia MetroHopper

Nokia Flexbus-compatible radio for the 58 GHz frequency band that does not require coordinated frequency planning. The main use of Nokia MetroHopper is to provide 4 x 2 Mbit/s, point-to-point wireless access for Nokia MetroSite BTS and Nokia MetroHub.

Nokia MetroHopper outdoor unit can be used with different indoor units: FIU 19, RRIC, FC RRI, and FXC RRI.

Nokia MetroHub

Nokia’s compact transmission node with cross-connection and grooming functions, such as FXC RRI. Nokia MetroHub contains up to five transmission units.

Nokia MetroSite GSM BTS

Nokia’s compact four-TRX GSM base station for Nokia MetroSite capacity solution. Nokia MetroSite GSM BTS can contain one transmission unit.

Nokia Q1 Connection Tool
: Program that makes connection and node definitions for identifying objects on a Nokia Q1 managed network. See Q1.

Nokia UltraSite
: Multimedia coverage and capacity macrocellular base station.

Omnidirectional Cell
: Cell with a 360× sector; also known as standard cell.

Operator
: Telecommunications company running telecommunications services in a specific geographical area.

PCM time slot
: 1.5 Mbit/s PCM circuit is divided into twenty-four 64 kbit/s time slots.

  2 Mbit/s PCM circuit is divided into thirty-two 64 kbit/s time slots.

Peltier elements
: Elements that absorb or emit heat when an electric current passes across a junction between two materials. Used for heating and cooling IP20 protection class equipment.

Point-to-point
: Transmission between two fixed points.

Q1-bus
: Bus in Nokia UltraSite EDGE BTS, used for local transmission management (Q1int) and for extending the management to external equipment.

Radio interface; air interface; AI
: The interface between the mobile station (MS) and the radio equipment in the network. This is defined by functional characteristics, common radio (physical) interconnection characteristics, and other characteristics as appropriate.

Radio Relay
: Microwave radio unit that replaces a fixed cable with a microwave radio link in the Abis Interface.

Rectifier
: Device for converting alternating current to direct current. See BATx.

RFU backplane
: Backplane in Nokia UltraSite EDGE BTS cabinet to which RF units are attached.

Sectored BTS Site
: A site with multiple cells positioned to supply the desired radiation.

Sectored Cell — A cell with a conical coverage area achieved by means of a directional aerial.

Single Sector — A part of the BTS's physical equipment that serves a single cell in the network radio topology.

Site — Location where telecommunication equipment has been installed. For example, a site can contain a base station and transmission equipment with an equipment shelter and antenna tower.

Several network elements can be located at a site.

Soft handover — Handover where the signal goes through two base stations or base station sectors at a time.

Softer handover — Handover where the signal goes through two sectors in one base station area at a time.

Software Package — Software collection consisting of the components of the BTS operating system.

Spreading — A process in which the signal is modulated with the pseudo noise code to get a wideband signal for multipath propagation in spread spectrum systems.

Spreading code — A code that is used to despread a signal in spread spectrum communications.

Star Connection — Transmission solution in which three branches with one BTS in each are connected to a common node. See Chain Connection, Loop Connection, and Multidrop Connection.

Synchronisation (Sync) — Process of adjusting the corresponding significant instances of signals (between adjacent and serving cells) to obtain the desired phase relationship between these instances.

Uplink — Direction of transmission in which the mobile station is the transmitting facility and the BTS is the receiving facility.

Uplink Diversity

2-way uplink diversity – Function in which a BTS uses two antennas and two receivers simultaneously on a single channel to obtain improved overall BTS receiver sensitivity in an environment that is subject to random multipath fading.

4-way uplink diversity – Function in which a BTS uses four antennas and four receivers simultaneously on a single channel to obtain improved overall BTS receiver sensitivity in an environment that is subject to random multipath fading.

See Frequency Hopping.

Related Topics

Removing a Transceiver Baseband (BB2x) unit from UltraSite EDGE BTS

Instructions

Replacing a Transceiver Baseband (BB2x) unit in UltraSite EDGE BTS

Descriptions

Technical description of Transceiver Baseband (BB2x) unit of UltraSite EDGE BTS

Removing a Transceiver (TSxx) unit from UltraSite EDGE BTS

Instructions

Replacing a TSxx unit

Descriptions

Technical description of the TSxx unit

Installing a Transceiver (TSxx) unit in UltraSite EDGE BTS

Instructions

Removing a TSxx unit from UltraSite EDGE BTS

Description

UltraSite EDGE BTS Transceiver (TSxx) unit technical description

Removing the door from UltraSite EDGE BTS indoor cabinet

Instructions

Installing the door to UltraSite EDGE BTS

Removing the roof from UltraSite EDGE BTS indoor cabinet

Instructions

Installing the roof to the UltraSite EDGE BTS

Removing a GSM/EDGE heater (HETA) unit from UltraSite EDGE BTS

Instructions

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