

MiVoice MX-ONE Site Planning

ENVIRONMENTAL SPEC



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1 INTRODUCTION

This document describes what to consider when choosing and preparing a site for an MX-ONE™ installation. The MX-ONE installation site must meet certain requirements to allow for proper installation, and operation and maintenance of the system. This document lists requirements, instructions, recommendations, and useful tips for the site-planning process.

1.1 SCOPE

This document describes the conditions and lists the preparations for a successful MX-ONE installation. The following two main types of requirements are described:

- Environmental requirements, such as site size, floor characteristics, and air quality.
- Electrical requirements for power supply and grounding.

1.2 TARGET GROUP

The target group for this document is Mitel customers and partners.

1.3 PREREQUISITES

The following prerequisites must be met before starting the site planning:

- The building floor plans must be available.
- Drawings of electrical cables, and water and gas pipes in the building must be available.
- Read through each device installation documentation, and from there, conclude where the equipment can be installed. Considerations shall be taken to environmental requirements, safety related issues as to avoid electrical hazards, etc.
- Special conditions are valid for the Nordic countries; Sweden, Norway and Finland, where the MiVoice MX-ONE must be installed in a Restricted Access Location (RAL). An analog trunk line generates a touch or leakage current, and when the MX-ONE is equipped with several analog connections to the public switch, to avoid an electrical hazard, the MX-ONE shall be installed in a RAL. To reflect this potential hazard, the equipment is marked with a warning text "High voltage...".
- All personnel must read and understand the safety document. See the document *SAFETY INFORMATION*.

2

REQUIREMENTS AND CONSIDERATIONS

This section describes environmental requirements and important considerations for site planning.

2.1

GENERAL CONSIDERATIONS

- It is recommended to place the MX-ONE in an internal room in the building. Placing the exchange in a room bordering with an external wall increases the risk for break-in and theft, and for the effects of weather conditions, such as temperature, rain, snow, direct sunlight, and wind.
- The MX-ONE components may occupy different rooms. In this case make the necessary planning for size of passages and doors, hole drilling, cable-ways, cable lengths, and so on.
- Consider constraints in the site form and structure when planning cabinet placement in the room (in rows, back to back, along the walls, or in other configurations).
- Make sure construction work, renovations, and other dirty, dusty work are completed before the arrival of electronic equipment to the site.

2.2

GENERAL REQUIREMENTS

- All drawings of the floor areas, ceiling heights, beam locations, window positions, doors, ventilation shafts, and previously drilled holes shall be checked for accuracy according to building or floor plans.
- It is recommended to have a work desk for maintenance needs in the room.
- It is recommended to have a telephone extension and a Local Area Network (LAN) extension in the room, for use during the site planning and installation work.

2.3

SITE DIMENSIONS

The site must be large and high enough to accommodate the cabinets with the exchange equipment, peripheral equipment, and optional spare parts.

It is very important to allow sufficient margins for future expansion of the system, whether or not it is currently planned.

2.3.1

GENERAL

The MX-ONE site installation includes the following types of cabinets:

- BYB 501 cabinets for exchange equipment, 600 mm wide and 400 mm deep. Cabinets can be mounted back-to-back to create a 800 mm deep cabinet.
- Standard server cabinets for MX-ONE Servers. These cabinets are 600 or 800 mm wide and 800 or 1000 mm deep.

To enable installation and service work on a BYB 501 cabinet, leave free space around the cabinet as follows:

- 800 mm on the front side of the cabinet
- 800 mm between the cabinet side panel and the wall (recommended).

To enable installation and service work on a standard server cabinet, free space must be left around the cabinet as follows:

- 800 mm on the front side of the cabinet
- 400 mm on the rear side of the cabinet.
- 800 mm between the cabinet side panel and the wall (recommended).

2.4 CABINET LAYOUT

This section describes a few examples for cabinet layout in different possible configurations. The minimal required room dimensions for each configuration are given. Note that mounting cabinets side by side saves room, but might complicate installation and service work.

2.4.1 TWO BYB 501 CABINETS

The figure below shows one standard server cabinet (800 mm x 800 mm) and one BYB 501 cabinet (600 mm x 400 mm). The recommended site size is 2.4 m x 2.0 m, 1 One BYB 501 Cabinet and One Server Cabinet on page 5.

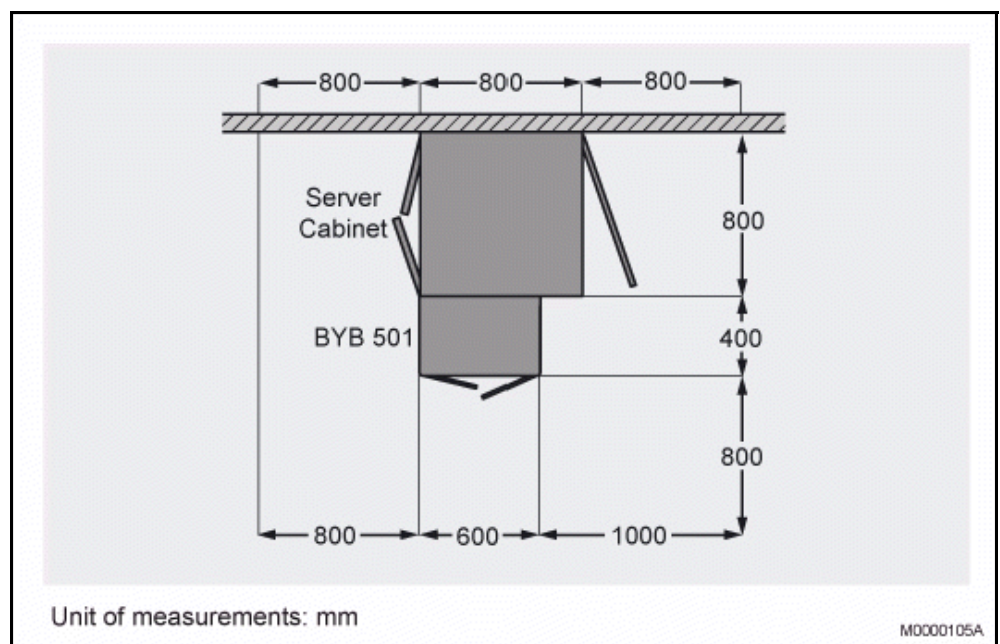


Figure 1: One BYB 501 Cabinet and One Server Cabinet

2.4.2 TWO BYB 501 CABINETS AND ONE SERVER CABINET

The figure below shows two BYB 501 cabinets (600 x 400 mm) and one bigger version of a standard server cabinet (800 mm x 1000 mm). The recommended site size is 2.8 m x 2.2 m, 2 Two BYB 501 Cabinets and One Standard Server Cabinet on page 6.

In this layout, the back of the BYB 501 cabinets are placed up against the side of the server cabinet.

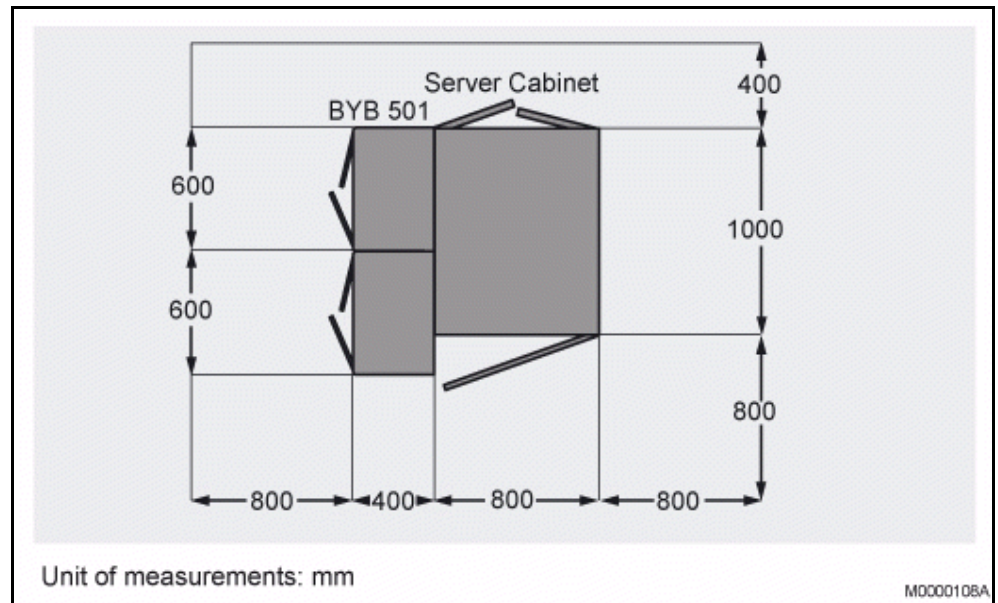


Figure 2: Two BYB 501 Cabinets and One Standard Server Cabinet

2.4.3

FOUR BYB 501 CABINETS AND ONE SERVER CABINET

The figure below shows four BYB 501 cabinets (or two double cabinets mounted back to back) and one smaller version of a standard server cabinet (600 mm x 800 mm). The recommended site size is 3.4 x 2.4 m, 3 Four BYB 501 Cabinets and One Server Cabinet on page 6.

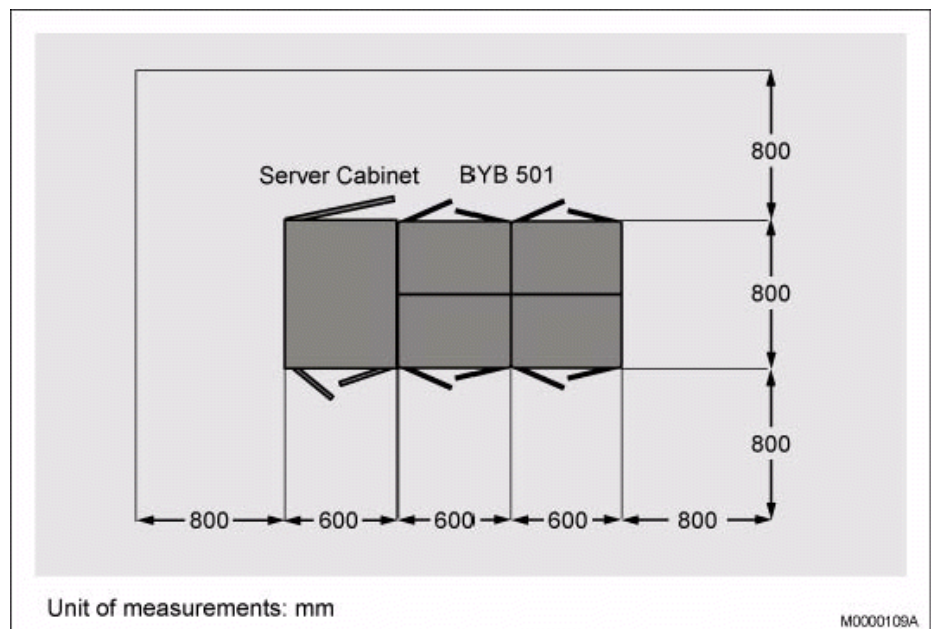


Figure 3: Four BYB 501 Cabinets and One Server Cabinet

2.5

SITE WALLS, WINDOWS, AND DOORS

MX-ONE cabinets must not be secured to the site walls due to earthquake safety considerations. The cabinets are to be secured to the site floor and in some cases to each other. Cabling to the cabinets should be drawn along the floor or the ceiling. Therefore, drilling in walls is only required for drawing cables between rooms.

When planning drilling in walls, floors, or ceilings, first check drawings or information about the location of electrical cables and water pipes to prevent damage during installation.

The exchange area should be as dust-free as possible to protect units with fans. Therefore, walls and ceilings should be dust repellent and painted with a plastic- or oil-based paint that contains no form of turpentine other than mineral spirits. Whitewash should not be used under any circumstances.

The following measures should be taken regarding the site doors and windows:

- All doors to the MX-ONE room should be lockable, and windows should be sealed or locked.
- Doors and windows must be closed tightly to reduce dust contamination.
- Protect from direct sunlight to avoid over heating. Direct sunlight can also damage the electrical equipment. Apply window covers, blinds, shades, or other necessary aids.
- Door openings must allow free passage of the cabinets and telephony equipment. Consider that the use of cabinet lifting equipment may be required, specially when fully-equipped cabinets are ordered.

2.6

SITE FLOOR

Preparing the floor area for the MX-ONE equipment is a major part of the site preparation. The procedure involves inspection of the floor type, material and condition, floor leveling, floor marking and preparing the floor for fastening the cabinets.

Prepare the floor as follows:

- The site floor must be flat and leveled. It is recommended that the floor slope will not exceed +/- 5 mm over a 5 m distance.
- Make sure the floor is strong enough for the weight of the ordered equipment. For concrete floors, the distributed load is the total mass of equipment in the room divided by the area of the room. A concrete floor must have a compressed strength of 25 N/mm² (C 25/30) or higher to enable proper anchoring of the exchange equipment, as well as other telecom equipment. For wooden floors, extra caution must be taken concerning the spot load of the cabinet rack.
- The floor should be covered by a grounded anti-static carpet to reduce the risk of the system being exposed to interference caused by static electricity.
- Floor coverings must be durable and made of a non-dust-producing material that is easy to clean.
- Conductive floors may be used, but they must be covered with protective carpet during the installation period. Conductive floors are not to be waxed with regular floor wax, since it insulates the surface and reduces the conductive quality of the floor.
- A raised floor system is in common use at sites hosting telecom equipment. The floor system consists of floor panels resting on a sturdy mechanical frame

system and pedestals. The floor system can be combined with optional equipment such as borders, stairs, guard rails, and ramps. When needed, it can be combined with earthquake bracing frames. See 2.7 Earthquake Bracing Frames on page 8.

- It is possible to mark cabinet placement on the site floor already at the site-planning stage. Floor marking includes site-engineering verification, validity check for the floor plan, and drawing of construction lines. Alternatively, “rough and ready” floor marking can be applied, using marking tape to mark cabinet placement on the floor.
- Make sure not to leave open cable holes in the floor.

2.7 EARTHQUAKE BRACING FRAMES

In areas subject to earthquakes, consider the following:

- Follow the regional earthquake code and relevant standards for earthquake protection in office buildings.
- At MX-ONE sites in such areas, it is recommended to apply preventive steps for earthquakes and to install earthquake bracing frames within the raised floor system or any other floor used.
- The installation of earthquake bracing frames can be done during either the site-planning stage or the preparation for MX-ONE installation stage.
- Use only approved earthquake bracing frames suitable for the site floor and for the size of the cabinets.
- Make sure the frames are firmly mounted and secured to the floor according to manufacturer instructions.
- Cable chutes may be installed in a raised floor when using earthquake bracing frames.

2.8 CABLING PREPARATION

Cabling preparation includes planning of cable ways, drilling holes in walls (if required), and installation of cable chutes.

It is recommended to complete all drilling and other work which produces dust and dirt before the arrival of electronic equipment to the site.

There are two recommended types of external cable routing systems:

- Cabling in a raised floor system
- Cabling in an overhead cable chute system

Which system to use depends on the site characteristics.

Cable chutes can be mounted on walls. In that case it is not recommended to fasten them directly to cabinets, due to earthquake safety considerations.

2.8.1 RAISED FLOOR SYSTEM

When installing cables in a raised floor system or in other floors for telecom equipment, the cables are placed directly on the floor or in cable chutes, 4 Example of Cable Routing in a Raised Floor System on page 9.

Routing cables on the floor is simpler and does not require the drilling and mounting of supports which are required for overhead cable routing.

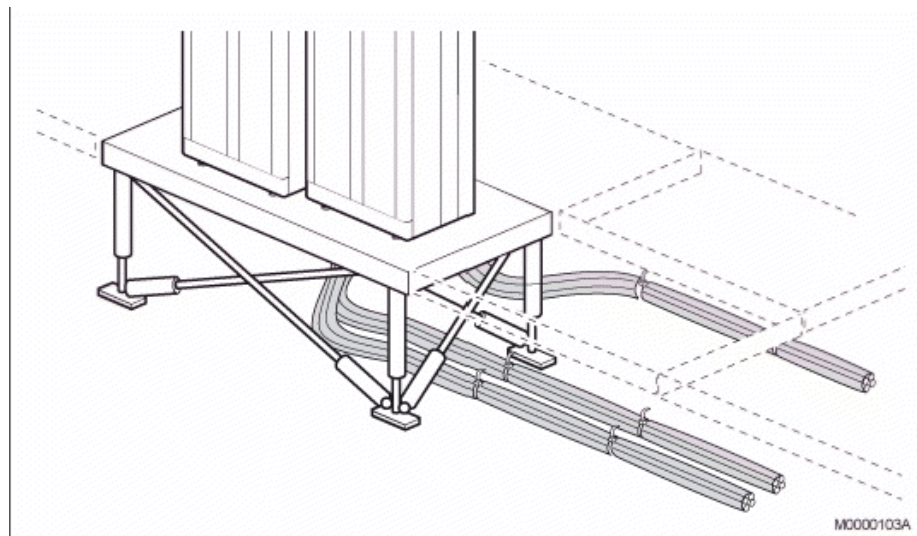


Figure 4: Example of Cable Routing in a Raised Floor System

When inspecting a raised floor system, make sure the following requirements are met:

- All floor pedestals and floor tiles are properly leveled.
- All floor mechanics are free from any damage or contamination.
- All ramps, guard rails, and borders are installed as required.

2.8.2

OVERHEAD CABLE CHUTE SYSTEM

In an overhead cable chute system, all external cables are run above the cabinets. The cables can be run in an overhead cable way with chute systems in one level or more.

It is important to consider cable weight. In larger systems with many extensions the weight of the cables can increase significantly and may require extra support for the overhead cable chute system.

Make sure the ceiling is high enough for an appropriate installation of an overhead cable chute system above the cabinets. The BYB 501 cabinet height is 180 cm, and the standard server cabinet height is 200 cm. An overhead mechanics cabling installation can reach a height of 440 mm.

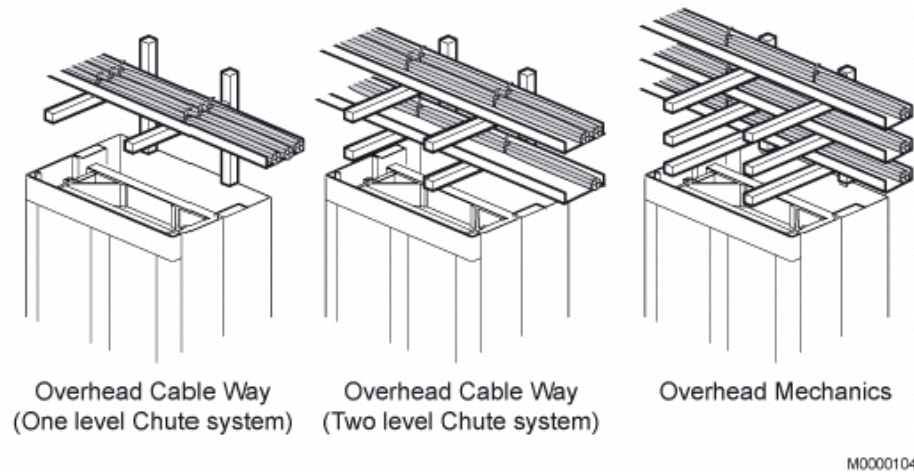


Figure 5: Overhead Cable Routing

2.9 HEAT DISSIPATION

When planning a site for MX-ONE, consider heat dissipation of the hardware components. For allowed room temperature, 2.10 Climatic Environment on page 10.

Calculate the total heat dissipation of the ordered equipment and allow for possible system expansion. For technical data on heat dissipation of MX-ONE components, see the description for *POWER DISSIPATION*.

Make sure the site dimensions are sufficient to prevent over-heating. Allow for future system expansion.

2.10 CLIMATIC ENVIRONMENT

Table 1 Temperature Range and Humidity

Product		In Operation	Storage
MX-ONE Slim (1U) or ASU Server ^{a)} MX-ONE Lite (3U) MX-ONE Classic (7U) MX-ONE Classic Fan unit	Temperature range	+5° C to + 40° C IEC 60068-2-1, -2, -14 and -56; ETSI EN 300 019-2-3 Class 3.1, Table 1, Normal climatic limits	-5° C to +55° C IEC 60068-2-1, -2 and -56; ETSI EN 300019-2-1 Class 3.1, Table 1
	Relative humidity	+5% to 85% IEC 60068-2-1, -2, -14 and -56; ETSI EN 300 019-2-3 Class 3.1, Normal climatic limits (no condensation)	Maximum +95% ETSI EN 300019-2-1 Class 3.1 (condensation)
AC/DC power unit - stand-alone (not built-in)		As specified by supplier	As specified by supplier

Product		In Operation	Storage
Limits for a non Mitel server, e.g. DELL server (model R320) Refer to suppliers documentation for details	Temperature range	+10° C to +35° C	-40° C to +65° C
	Relative humidity	20% to 80% non condensing	5% to 95%

a) Recommend use of SSD disk as storage media, if exposure to earth quakes is anticipated.

Table 2 Mechanical Range

Product	Seismic exposure (product in operation)	Transport
MX-ONE Slim (1U) or ASU Server ^{a)} MX-ONE Lite (3U) MX-ONE Classic (7U) MX-ONE Classic Fan unit	VERTEQ II IEC 60068-2-6, -27, -64 and GR-63-CORE; ETSI EN 300-019-2-3 Class 3.2 Table 5	Random and bump IEC 60068-2-29, -32 and -64; ETSI 300 019-2-2 Class 2.2 Table 4
AC/DC power unit - stand-alone (not built-in)	As specified by supplier	As specified by supplier
Limits for a non Mitel server, e.g. DELL server (model R320) Refer to suppliers documentation for details	VIBRATION 0,26 G _{ms} at 5 Hz to 350 Hz (all operation orientations)	VIBRATION 1,87 G _{ms} at 10 Hz to 500 Hz for 15 min (all six sides tested)

a) Recommend use of SSD disk as storage media, if exposure to earth quakes is anticipated.

2.11

ILLUMINATION

- General light fixtures should be installed and produce evenly distributed light measuring a minimum of 300 lux at 1 meter above the floor. The lighting should be glare-free and equipped with anti-dazzle fittings.
- Voltage caused by electromagnetic fields from sources such as power lines can create disturbances for the exchange equipment. Ensure that readings of electromagnetic fields do not exceed the recommended ranges. The recommended range for frequencies 0 – 1 GHz is 1 V/m, and 10 V/m for frequencies above 10 GHz. Magnetic field readings that exceed 10,000 A/m for frequencies below 1 kHz are not acceptable.
- It is recommended to install emergency lighting (for power shutdown) at the site.
- It is recommended to have a directional lighting fixture or a flashlight at the MX-ONE site for different work needs.

2.12

ALARMS

It is recommended to install the following alarms at the site:

- Burglar alarm to protect the exchange equipment against break-in and theft.
- Water or flooding alarm in case the room has a floor drain or other flooding risk exists.

- Fire Alarm including smoke and heat detectors, and an automatic alarm siren. Clearly indicated alarm buttons should be situated in suitable places throughout the building. If a fire alarm system is installed, it should be operational before the installation work begins.

2.13

ADDITIONAL EQUIPMENT

Make sure there is enough space for the following additional equipment, if needed:

- MDF
- Separate batteries
- External AC/DC equipment
- Uninterruptible Power Supply (UPC)
- LAN Switch
- Keyboard Video Module (KVM)

3

ELECTRICAL REQUIREMENTS

This section specifies requirements for power supply and grounding.

3.1

MAINS ELECTRICITY POWER SUPPLY

Some equipment is designed to be connected to non-industrial (domestic) socket outlets, while other equipment is designed to be permanently connected to the supply or connected by industrial socket outlets.

The site must meet the following power requirements:

- A mains electricity supply with a voltage between 205 V and 240 V must be available in the site.
- For every ordered AC/DC power supply unit in the MX-ONE, there must be one connection to the mains power supply. This connection can either be a permanent connection or a socket outlet for an industrial plug. Industrial socket outlets must comply with IEC 60309 or with a comparable national standard.
- Every Media Gateway and every server requires its own socket outlet.
- An adequate amount of non-industrial (domestic) grounded socket outlets must be available and easily accessible at the site. The socket outlets should be located near the exchange equipment they are intended to serve.
- An adequate amount of socket outlets should be available for additional equipment (2.13 Additional Equipment on page 13).
- A few reserve socket outlets must be left for occasional working purposes, like installation, maintenance, testing, cleaning, and so on. It is recommended to leave at least five socket outlets, regardless of the size of the exchange.
- For service purposes, there must be an accessible main switch (disconnect device) in the site, for disconnection of permanently connected equipment from the mains supply.

A power emergency switch is not mandatory.

3.2

GROUNDING

- Verify that a main grounding terminal exists in the premises or that such a terminal can be arranged.
- Verify that it is possible to draw a ground cable from the main grounding terminal in the building to the MX-ONE site.