

SECTION 26 05 26: GROUNDING & BONDING

1. GENERAL

- A. This section details the requirements for the grounding and bonding of building electrical systems and related equipment.
- B. All grounding materials to be copper or bronze, unless they are part of factory assembled aluminum assembly (bus-duct).
- C. Grounding conductors in building to be bare copper, or 600 volt insulated wire, installed conduit.
- D. Above ground connections: exothermic welded or bronze mechanical connectors
- E. Ground Wells:
 - 1. Well Pipe: 8" NPS by 24" fiberglass pipe with belled end.
 - 2. Well Cover: cast iron with legend "Ground" embossed on cover.
- F. Provide two independent grounding connections for medium voltage distribution and service transformers, switchgear and unit substations.
- G. Inspect and test grounding system in accordance with NETA ATS and submit a written report of results for Engineer of Record review and for inclusion in the O & M manuals
- H. Exterior Lighting:
 - 1. For large site lighting and parking lot poles (over 15 feet height), provide supplementary ground rod and connection at each pole.
 - 2. All underground lighting circuits for site lighting must contain a dedicated ground copper wire.
- I. The building grounding system shall include the following grounding electrodes:
 - 1. Building metal underground water pipe
 - 2. Building structural steel
 - 3. Ufer ground system (connections to reinforcing steel not smaller than #4 within the column footings and grade beams) OR a ground loop around the entire building
- J. Grounding systems must meet the following ground resistance values:

Data Center	Less than 2 ohms
Outdoor Transformer/Switchyard	Less than 5 ohms
Low Voltage Building Service	Less than 10 ohms
Medium Voltage Building Service	Less than 5 ohms

2. BUILDING GROUNDING SYSTEM

- A. Isolated ground conductors, if required, to be connected to the building ground system only at its separately derived supply transformer grounding location, per IEEE Std.1100 guidelines. Isolated ground distribution panels to include a separate isolated ground bus and bonded equipment ground bus.

- B. Where individual transformers (less than 300 KVA) and associated switchboard or panelboard is used, make the bonding jumper connection in the transformer enclosure.
- C. At each separately derived system, such as a transformer, the bonding jumper and grounding electrode conductor connection to be located within the same device. For a unitized secondary substation, the connection to be in the switchboard section just before the main breaker.

- D. Main Building Electric Rooms:
 - 1. Provide a copper ground bus, which serves as the common grounding electrode conductor.
 - 2. This ground bus is to be the common grounding and bonding point for the incoming electrical service grounds, supplementary grounding electrode connections and as the common grounding point for connection and bonding of other building systems, such as telecommunications, lightning protection and various separately derived electrical systems.
- E. Medium Voltage Substation & Main Electric Rooms (buildings with medium-voltage (over 600 VAC) services and /or distribution equipment):
 - 1. Install a continuous grounding bus-ground bus to be 2"x ¼" hard drawn copper bar.
 - 2. Attach ground bus to the wall, at 30 inches above the floor, with standoff insulators. The ground bus shall be located behind the high voltage loop switches and extend the entire length of at least two walls inside the room so that it is accessible for connections.
- F. Low Voltage Building Main Electric Rooms: provide a 2"x ¼" x minimum 24 inches long hard drawn copper ground bus bar; attach ground bus to the wall, at 30 inches above the floor, with standoff insulators.
- G. Electrical Distribution Rooms & Closets & Telecomm Rooms (electrical distribution rooms and closets with multiple panels and stepdown transformers installed):
 - 1. Install a 2"x ¼" x minimum 12" long hard drawn copper ground bus bar, mounted on standoff insulators.
 - 2. Connect local ground bus back to main electric service room ground bus.
- H. Equipment Grounds:
 - 1. Do not use electrical equipment enclosures (transformer case, etc.) as a grounding path.
 - 2. Install a separate ground conductor with all feeders and branch circuits. Do not rely on the conduit as the grounding means—ground to the cabinet of the panelboard or a non-insulated ground bus.
 - 3. Provide bonding bushings on conduit fittings for all feeders rated over 200 amps.
 - 4. Provide external grounding conductors for flexible liquid tight metal conduit fittings.