50. Raised Floor Equipment Installation Standards for AT&T Equipment Locations

50.1 Overview

For all new telecommunication equipment space, AT&T is requiring that the equipment be mounted on a raised, seismic Equipment Mounting Platform System (EMPS) **ATTP 760-200-110**, similar to that used in computer facilities. This platform has been specially developed to be compatible with equipment designs and to meet seismic and installation requirements.

Click here to access: **ATTP 760-200-110**

If you have any questions on the above EMPS practice, please contact Rich Mickle on (770) 785-4233, or E-Mail mickle@att.com

The space in the equipment area is divided as follows:

? Below raised floor
   a) power distribution
   b) smoke detection
   c) system interconnection cabling

? Top of raised floor to 11 foot level
   a) equipment cabinets
   b) cable distribution and cable enclosures
   c) air circulation space
   d) overhead lighting

? Over 11 foot level
   a) ducting and piping

50.2 Floor Height

The Company's standard is a twenty-four inch finish platform height although there are many existing raised floors that are three and four feet. Installation procedures are the same regardless of the height. Finished floor height is to be measured from concrete floor to top of removable panel.

50.3 Cabling Overview

Running cable under a raised floor must be done in a manner similar to running cable overhead on cable racks. The vendor must follow cable paths to get from one frame to another. The cable must be neat, protected, sewn when on racks, and must not be mixed with other types of cable.

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The only cable racks used under the floor are for primary power cables from the power room. Secondary power feeders and switchboard cable are run directly on the concrete floor. Fiber, bus, and AC is run in separate raceways designated for each and attached to the pedestals that support the raised floor.

50.3.1 Raised Floor Cabling Rules

- ? Standard designated cable paths with "signs" on pedestals shall be used to specify the paths.
- ? All cable diversity rules such as "Golden Path" and power must be followed under the floor as well as above.
- ? Power, switchboard, & fiber cable to be run in different paths or "shields" similar to cable racks above the frames. No mixing of cable types allowed.
- ? Switchboard cable to be run neatly down lineup paths and protected from all sharp metal edges. Run directly on concrete floor.
- ? Cable bridges should be used for cross aisles to prevent cable buildup but should be minimized to avoid excessive cable crossovers.
- ? Slack for excess cable runs should be taken up in the same lineup, not coiled up next to the bay.
- ? All FPS (Fiber Protection System) should be the plastic orange type or equivalent, no aluminum or steel FPS should be used. Should be mounted on pedestals, not on cable racks or on the concrete floor. No sharp bolts or wing nuts should be used to support FPS or they should be covered to avoid damaging cables.
- ? All 4ESS BUS cable must be run in a raceway mounted on pedestals. If raceway is metal it must be insulated from pedestals as 4ESS is isolated ground and the under floor environment is integrated ground.
- ? Primary power runs from power room to PD/BDFB to be secured on cable racks under the raised floor. Cable racks to be mounted on u-channel and must be grounded to central office ground (COG), not isolated ground.
- ? Secondary power feeders from a PD / BDFB are to be run on concrete floor, but A & B loads should never cross or be run together. They can be run under same lineup, but should be banded on opposite sides of the lineup.
- ? Under normal conditions, floor stringers "Shall Not" be removed to install cables. If office and/or job conditions require the stringers to be removed, the procedure must be listed in the MOP and approved by the appropriate AT&T representative.
- ? No coils of cable or other materials should be stored under the raised floor,

50.3.2 Bringing cable up from under raised floor

- ? When bringing cable into cabinets such as 5ESS, the removable raised floor tile is cut to the cabinet template, the hole insulated to protect the cable, and the cable is brought directly into the cabinet. Use frame method of cabling drawing if available.

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? When frames are used instead of cabinets such as in 4ESS, cable enclosures are used to bring cable from under the floor and into cable racks bolted to the frames. A cable access hole is cut in the floor tile to meet the opening in the cable enclosure. The hole has fiber protection added to protect the cables, and the cables must meet the same requirements as cable rack on top of the frames. They must be brought up and separated by cable types or shields. Shield one is either fiber or bus cable, shield three is switchboard or T&R, and shield four is power. Shields cannot be mixed and load A (red) and load B (blue) secondary power cannot be run together. Use opposite sides of the enclosure or metal dividers on the same side to separate shields

50.3.3 Cable racks and cable bridges

The only cable racks used under the raised floor are for the primary power cable from the power room, vertical racks to cable enclosures and all racks must meet these requirements:

? Horizontal cable rack must be mounted on u-channel anchored to the concrete floor.
? Cable rack must be grounded to integrated ground to clear any faults fast.
? Cable bridges should be used for cross aisles per the office cable plan to prevent mixing of shields and interweaving of cable.
? Vertical rack to cable enclosure must be secured on every strap and rack must be grounded to integrated ground..

50.4 Equipment Installation

50.4.1 Leveling of equipment

The raised floor is laser leveled at time of the floor installation so no leveling blocks or shims should be necessary to level the frames. This is especially important in seismic zones 2B and higher as leveling blocks would cause a rocking motion of the frames during a earthquake. If a vendor finds the floor is not level they should contact the AT&T representative and they will make sure the floor is level before starting the installation.

50.4.2 Cutting and drilling of removable floor tile

Mark removable floor tile for the cable access from below into the cabinet using template supplied by frame vendor, floor plan drawing, or place frame in proper footprint and mark the tile from the base of the frame or cabinet. Mark the tile for the frame anchoring holes in the same manner. Remove the tile, cut cable access holes, and drill anchoring holes through the tile in an area away **from the equipment** to make sure the equipment area is not contaminated with metal shavings. If the floor plan identifies a future frame on the same tile as the one you are adding a frame, it is necessary to drill and cut the tile for the future frame as you cannot remove the tile later.

It will be necessary to use alternate anchoring holes in the event the primary holes are obstructed by the stringers supporting the removable tile.

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50.4.3 Framework Anchoring Details

To anchor framework to a raised floor, the vendor must first know what earthquake zone the equipment is being installed in. Zones 0 -2A have the frames bolted to the raised floor through a u-channel across the bottom of the floor tile and stringers. Zones 2B - 4 have ½ inch threaded rods extending through the raised floor and connected to seismic anchors with coupling nuts. Standard hold down parts are used on top of the floor for all zones with the only difference being the length of the threaded rod. Anchors and hold down material to be engineered for proper seismic zone.

50.4.3.1 Seismic Zones 0 - 2A

To fasten network and unequal flange duct framework to a raised floor, place under the stringers a 1-5/8 x 1-5/8 u-channel with continuous slot down and clips covering the free ends of the u-channel to prevent it from spreading when compressed. Use hold down plate engineered for that frame, and use threaded rod, nut, washer, insulating bushing and hold down washer in the base of frame, and clip, washer, lockwasher, and nut on bottom of u-channel. The u-channel should not extend more than four inches past the edge of the stringers or it will block access under the floor. End caps must be used on the u-channel to prevent injury. Torque the nut to 30 foot pounds. Do not over tighten as the tile will become deformed and will be uneven with surrounding tiles

50.4.3.2 Seismic Zones 2B - 4

In seismic zones 2B and higher threaded rods are run down to seismic anchors with coupling nuts from the concrete floor. U-channel is not used in higher earthquake zones. Anchor the cabinet at all four corners in higher earthquake zones. Do not over tighten threaded rods as floor tile will deform and make floor uneven.

50.5 Raised Floor AC Distribution

- ? The vendor line engineer shall provide AC wiring and appropriate conduit or raceway to feed power from the customer's AC system . AC wiring shall conform to National Electric Code (NEC) Article 310 "Conductors for General Wiring".
- ? Aluminum Raceway or the equivalent shall be used to house the AC wiring and shall be supported from the floor stanchions.
- ? The vinyl jacket covering of the flexible conduit does not serve as an insulator at each point of contacts or support with metal (integrated ground) hardware. The installer shall wrap the metal with fiber insulation.

- ? In 4ESS raised floor applications, appliance outlets are to be located in cable enclosures only.

- ? In 5ESS raised floor applications, appliance outlets are to be located in end guards only.

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50.6 Raised Floor Grounding

Section 18 of this document is the standard for AT&T grounding. This section is in addition to section 18 with raised floor specifics.

- Grounding of the raised floor platform is shown in AT&T Standard **760-200-110** and is orderable from CIC.
- Electronic Switching equipment on top of a raised floor is connected to isolated ground while the environment below the floor is integrated ground including the stanchions and all cable rack.
- Conductive objects more than 7 feet from the isolated ground plane must be grounded to the closest Central Office Ground (COG) Bar.
- Conductive objects in close proximity to the Isolated Ground Plane (7 feet or less) must be maintained at a ground potential as close as possible to the Isolated Ground Plane for personnel safety purposes during lightning strikes or high voltage faults. This is accomplished by connecting these objects to the Main Ground Bus (MGB) in the ground window.
- Conductive objects include frames, cable rack sections, air conditioning ducts, storage cabinets, and electrical conduits supplying power to aisle lighting fixtures.
- Ground connections are to be made with insulated, no. 6 awg copper stranded wire and two-hole compression lugs.
- Frame grounding is the same for raised floor installations as it is for concrete floor and can be seen in section 18 of this document or on office grounding drawings.

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