

Tower Communications

“Your Total Wireless Solutions Provider”

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SITE MANAGEMENT EQUIPMENT INSTALLATION RULES

These are the Site Minimum Requirement's

Specific tenants may have unique requirements and their lease may be different.

1. EQUIPMENT MOUNTING:

- **A.** Each rented rack space allocated in the building is based on the space required for a standard 19" wide rack space. Tenants may lease multiple adjacent rack spaces under a single contract. The actual floor space allowed per leased rack is 24" X 24". All equipment, whether actually rack mounted or housed in a cabinet, shall not exceed these measurements. Ventilation of equipment, battery boxes, power and RF transmission lines are to be taken into consideration.
- **B.** The rack or equipment cabinet is to be securely mounted to the floor, or the top secured to the cable tray, to prevent such equipment from being tipped over accidentally while someone is working in front or behind such equipment, or by an earthquake.
- **C.** Cabinets are not to be stacked on top of other cabinets without securing the top cabinet to the one below. If the lower cabinet is not owned by the same tenant, then written permission must be gained from the lower tenant prior to drilling or mounting to the lower cabinet.
- **D.** All racks / cabinets will be secured electrically to the earth-ground provided in the building. This is to be accomplished using heavy copper braid, or a minimum of #6 stranded copper conductor. If insulated, standard electrical grounding codes require it to be green in color.
- **E.** All RF transmission cable will be routed neatly, and secured in the provided overhead cable trays. Excess cable is not to be coiled up in the cable tray, nor is a coil to be strapped to the bottom of the tray.

- **F.** All transmission cables shall be bonded to the tower at the top and bottom, and be terminated with a “Poly-Phaser” lightning arrester unit upon entry to the building. Jumper cables, from transmission lines to individual racks or cabinets, will be run to equipment racks or cabinets through the cable trays neatly and kept as short as reasonably possible.
- **G.** No equipment is to be set on the floor around the rack or cabinet space, with the exception of duplexer cavities or transmitter-combining equipment, which will occupy the next adjacent rack / cabinet space. All cavities / combiners should be mounted into a cabinet whenever possible.
- **H.** All transmission lines will be identified using proper tags, located in transmitter building.

2. ELECTRICAL WIRING:

- **A.** All equipment connected to commercial power must have the standard grounded three-prong plug, and the safety ground must be intact on the plug.
- **B.** Outlet strips and outlet boxes used to operate several pieces of equipment inside a rack or cabinet must be permanently affixed to the rack or cabinet and the “green wire” bonding ground must be intact from the power panel through the rack power cord, through the outlet strip or box (or all of the outlet strips or boxes) all the way to the radio equipment frame.
- **C.** All backup batteries must be housed in a nonflammable box (or boxes) with a lid. This will avoid accidental access to the battery terminals, and will also contain any chemical leakage. All batteries should be kept within the allocated floor space for that rack. Additional space for batteries if needed will be considered on a case-by-case basis. Even if it’s obvious which rack they are hooked to, battery boxes must be labeled with the system owner’s name, the rack number, and the total string battery voltage and capacity, for example “XYZ Ambulance Inc., Rack #14, 14 volts 80ah”.
- **D.** Wiring from batteries to equipment must be neatly run, and any connections to the batteries must be protectively fused as close to the batteries as possible.
- **E.** All cabling and harnessing required for a given rack or cabinet will be neatly tied, or dressed, to the specific rack; or in the case of cabinets, all cabling will be neatly routed inside the cabinets. No cabling is to hang or drape outside of the cabinet(s).

3. RADIO FREQUENCY TRANSMISSION:

- **A.** All non-rigid cable used as jumpers between transmitters and transmission line will consist of good quality cable such as Belden type RG-142, RG-214, or RG-400. Cables of the RG8X “Minifoam” and similar cable will NOT be allowed, as these cables do not meet required shielding specifications for use as transmission cable.
- **B.** All RF cables, from the tower to the building, must be terminated on equipment of proper impedance, or if not connected to equipment then the cables are to be attached to a termination load of proper impedance. RF cabling un-terminated is impedance mismatched and will have the potential ability to radiate inside the building and cause interference to other users.
- **C.** All transmission cables will have the outer shield bonded to the tower at the top of the transmission line and at the bottom of the tower. Each feedline will also be bonded to the earth-ground provided when entering the building at the cable entrance. “Andrew” type grounding kits are the preferred method to accomplish this. These connections are to be waterproof.
- **D.** All penetrations of the exterior walls for the feedline will be done with the permission of the site manager. Once the feedline is installed all holes will be plugged per the site manager’s directions to make them waterproof and preclude all local wildlife from entering the building through the new hole(s). If a tenant observes an unplugged wall breach, he is urged to plug it and notify the site manager.
- **E.** No transmitting antenna of any type is permitted to be installed inside the buildings. Use common sense discretion when transmitting with cell phones and hand held radios while inside the buildings.
- **F.** No transmitters without operational harmonic filters.
- **G.** Pressurized feedlines requiring a nitrogen cylinder shall have the cylinder fastened to the cabinet in such a way that they can not be tipped over. Alternatively the cylinder may be fastened to the wall next to the feedline pass-through or under the appropriate cable tray using an approved wall bracket system (with an intact, code-compliant and in-service backup safety chain) and a nitrogen hose run through the tray to the injection fitting. The cylinder valve or hose will be labeled as to which rack / feedline it connects to, i.e. “XYZ Ambulance Inc., Rack #14”. The site manager will be consulted before the bracket is mounted to the wall.

4. ANTENNA MOUNTING:

- **A.** All antennas are to be mounted on the tower structure in its assigned spot. No antennas will be mounted to the buildings without prior written approval from the site manager.

- **B.** All antennas mounted on the tower structure shall be mounted using commercially accepted galvanized or stainless hardware.
- **C.** No bare copper wire (of any type) on towers! It's simple chemistry. The copper will eventually chemically etch the zinc out of the tower galvanization. The tower will eventually rust where the copper touches it.
- **D.** All cables must be secured by snap-in's or Andrew tire wires. No electrical wire is permitted. Butterfly style securing is not preferred and must be approved by site manager.
- **E.** Antennas are not to be installed or removed at the site without prior authorization from the site manager.
- **F.** All inverted antennas must be designed by the manufacturer for inverted mounting.
- **G.** If a tenant observes an antenna problem (s), he is urged to be a good neighbor and look up the color code, or tag, on the feedline and notify the responsible person (s) as well as the site manager.

5. DOCUMENTATION AND LICENSING:

- **A.** All tenants are required to have a current F.C.C. license permitting transmission from the radio site prior to the installation of equipment. Permission to occupy the site will not be granted without prior hardcopy proof of proper license and correct / current coordination. All transmitters are to have an up-to-date copy of the FCC License for each transmitter's frequency attached to the specific cabinet or rack for inspection. **This is an FCC rule.** Copies of all license updates and renewals will be provided to the site manager, as well as being posted on the appropriate cabinet.
- **B.** Next to the license mentioned in item A must be a dated sheet of paper listing all transmitting frequencies for equipment in that cabinet, plus a minimum of three contact names and their associated phone numbers (work, home, cell phone, pager, answering service, mother-in-law, etc...whatever is appropriate...). The tenant is responsible for providing a current copy of their contact list for the site manager's office files and keeping the contact information current on the cabinet due to the fact that interference troubleshooting is not limited to just the site manager.

6. INSPECTION / ACCESS:

- **A.** All buildings and equipment will be inspected for compliance of this installation and operation code by the site manager at any time, especially if necessary in the process of interference troubleshooting.
- **B.** All transmitters will be inspected to determine compliance of their F.C.C. authorization (frequency, modulation & transmitter power output).

- **C.** All transmitting antennas will be inspected along with transmitter output power to insure that maximum F.C.C. authorized ERP is not exceeded.
- **D.** Should a specific transmitter be determined to be causing harmful interference, the contact sheet on the rack or cabinet will be used and the first person will be called, and when contacted be requested to shut off said transmitter immediately. If the contact person cannot be located, the second name will be tried, then the third. If transmitter shutdown will be delayed the site manager will shut off said transmitter by shutting off the circuit breaker to the appropriate cabinet if there is no other means of shutting it off. As stated above, contact information on the rack or cabinet must be kept current. Systems with battery backup must have a clearly labeled and accessible transmitter shutdown switch. This switch must shut down **all** transmitters in the cabinet.

7. SITE INFORMATION:

- **A.** Tenants understand that the site buildings are alarmed for temperature, power fail, generator transfer and all FAA tower lighting.
- **B.** Air conditioning systems are set at 72° and are to be kept at that setting. Over cooling of equipment can cause condensation while entry door is opened and closed.
- **C.** Ensure that all doors and gates are locked when leaving site.
- **D.** Report any issues with the tower site to the site manager.

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