

Guidelines for Contracted Personnel to Install/Replace Fixtures on MLGW Communication Towers.

1. Request and Approval Procedures

- 1.1. Telecommunications provider “Carriers” will submit a written request to the MLGW Utility Coordinator for proposed communication equipment that will include a general description of the proposed communications equipment to be installed, the MLGW structure number on which the proposed equipment is to be mounted, the structure location with respect to nearest street intersection or landmark, and the structure’s relation to any other MLGW structures in the immediate vicinity. This structure number shall be made a part of all correspondence and record drawings including site plans, site agreements, and all other supporting documents.
- 1.2. MLGW Wireless Committee will conduct a preliminary review of structural, electrical, and utility conflicts. Structures will be inspected by MLGW Telecommunications Engineering Department. No authorization will be given to commence construction until all towers are made in suitable condition.
- 1.3. MLGW will not supply the carrier with copies of the easement documents. This information can be obtained by using Mid-South Title Company:
Locate: 1-800-351-1111
Title Company: 901 685-3748
Lawyer’s Title: 901 685-2500
- 1.4. MLGW will grant preliminary authorization to proceed with the planning and design of the ground equipment. The carrier will supply MLGW with the detailed specifications of the proposed communications equipment to be mounted on the structure required to proceed with the engineering of the antenna mounts by MLGW Telecommunications Engineering Department or its consultant. MLGW reserves the right to allow the carrier to hire its own engineering consultant to engineer the antenna mounts under special circumstances.
- 1.5. MLGW will return a cost estimate and schedule for the engineering of the antenna mounts. The estimate will include, but not be limited to, the structural analysis of the tower with proposed antenna(s), detailed plans for the erection of the antenna, platforms, and the mounting of coax cables on the structure, and the design of any foundations required to support the antennas. The cost estimate will include only engineering and design but will not include the purchasing of any materials or labor and equipment required for the installation. The primary contact for MLGW consultant will be provided to the carrier at this time.

- 1.6. MLGW will provide plan & profile drawings, tower erection drawings, and this specification upon customer's request to enable the carrier to develop its construction plans for ground equipment, access roads, and electrical site service. It will be the responsibility of the carrier's engineering consultant to coordinate its work with MLGW Telecommunications Engineering Department or MLGW engineering consultant.
- 1.7. Telecommunications Company will submit site plan for approval. Site plans shall conform to all applicable standards and those described in Section 2 of these specifications.
- 1.8. Completion of Contract and/or Commencement Agreement and preconstruction meeting before any site work begins.

2. Design and Engineering

- 2.1. All tower analyses and intermodulation studies shall be performed using the appropriate tower analysis programs, latest version. The analysis shall be representative of the detailed antenna mount plans and shall be re-run per changes to the design. The intermodulation study shall investigate how various combinations of transmitter frequencies (and their harmonics) may generate resultant "intermodulation products" that fall on (or in a specified range or "guard-band" of) MLGW's receiver frequencies. The study shall produce a list of potential problems where multiple transmit frequencies may interfere with MLGW's equipment in the same area. In the event that the tower does not meet structural strength requirements or the intermodulation study finds potential intermod effect of a particular transmitter, the carrier will be given the option to modify the size and number of antennas to meet these requirements. No structural modifications to the arms, post angles, or foundations of the tower will be allowed. It is up to the discretion of MLGW's Telecommunications Engineering Department to allow any other minor modifications to the structure.
- 2.2. All tower modification and antenna bracing to the tower shall be detailed per TIA/EIA-222-F, Guide for Self-supported Communication Towers, latest version. All connections from the antenna support to the tower and any replacement members for the tower shall be detailed, complete with referenced dimensions from existing bolts or tower members. All interferences to the installation of additional bracing members and the drilling of additional holes with typical equipment shall be checked in the overall design. All plans will include a bill of material to include member sizes and weights, fabrication details, material specifications, and any installation instructions required. No conceptual or illustrative documents

or plans indicating the need for adjustments and/or modifications in the field will be approved as construction documents. In addition, the approval of construction documents developed by the carrier's engineering consultant does not indicate that a detailed design check of the work has been performed by MLGW Engineering.

- 2.3. Site must have a sign on the gate with the name of their company, site name, tower number, and a telephone number for MLGW contact 24 hours a day. The appropriate electromagnetic energy signs in accordance with Federal Communication Commission rules on radio frequency emissions 47 CFR 1.1307(b) must also be displayed.
- 2.4. All utility services to the site shall be underground and identified on the plans. Site utility service shall be handled through the Customer Engineering area of the appropriate work center that the proposed site is located within.
- 2.5. There shall be no welding allowed directly to the structure.
- 2.6. Galvanox paint should be applied to all holes drilled in existing tower members and any steel that is to be connected directly to the tower.
- 2.7. Coax must be located inside the tower body on the ahead or rear tower face and away from the step-bolt leg of the tower. The coax should be run adjacent to the post angle to allow the post angle to partially shield the coax from additional wind loads. The waveguide ladder should be secured to the tower through the use of u-bolts or j-bolts.
- 2.8. The step bolt leg must be identified on the drawings submitted for approval. No structural modifications may be made to the step-bolt leg of the tower.
- 2.9. No permanent generation or fuel storage will be allowed within a Communication Tower Easement. Provisions will be allowed to connect temporary portable generation in the case of a prolonged outage.
- 2.10. Every effort shall be made such that the addition of the antenna and associated facilities shall not impede access in, around, and on the tower or sacrifice the structures existing level of safety.
- 2.11. Palnuts (are an inexpensive replacement for standard lock nuts and washers. They can be used in many applications for quick and easy assembly and reused) shall be used and properly installed on all new bolts.
- 2.12. The latest date of this specification must be made a part of the plans for each site.

- 2.13. All structural analyses, intermodulation studies, and site and structural drawings must be stamped by a Licensed Professional Engineer of the state of Tennessee.
- 2.14. The contractor shall design and install grounding system that connect the proposed towers and equipment shelter in conjunction with the National Electrical Code and TIA/EIA 222F Standards as well as local grounding-related buildings code. Telecommunications Engineering Department at MLGW will provide all the necessary sketches that bidder might need prior to installation of the towers and shelter in order to design a grounding system.

- **GROUND RODS**

An industrial grade, copper clad steel rod with a minimum diameter of 5/8 inch shall be used in designing the grounding system.

- **CONDUCTORS**

Conductors are the wires, bar or straps, which connect, ground rods together to form ground rings and allow connection of objects to be bonded to the grounding system.

- **CONDUCTOR TYPE**

All conductors shall be solid tinned copper wire, #2 AWG minimum and copper strap, 3 inch width by 0.0159 inch (26 gauge) thickness minimum for below and above earth grade.

3. Construction and Maintenance

- 3.1 The safety of Memphis Light, Gas & Water Division personnel, property, contractors, employees, and the public is of paramount importance in the performance of any work on MLGW communication towers. As reinforcement and in furtherance of overall safety measures to be observed by all work performed by the contractor shall conform to OSHA's requirement of the use eye protection, hard hats, safety shoes, gloves or any other necessary personal protective equipment (PPE). The terms "contractors" and "employees" as used in this document refer to all employees of the contractor as well as all employees of any subcontractor.

MLGW is committed to providing the safest workplace possible for our employees, our contractor's employees, and the public. Adherence to these minimum safety requirements, plus additional instructions at the job site, will help to ensure an accident / injury-free project. Accidents do not "just happen"; accidents are the results of unsafe conditions or unsafe acts, or a combination of both. Therefore, MLGW employee/s in charge of

that particular job is authorized to take any actions necessary to prevent injuries to any person, damage to property, or disruption of MLGW daily operations.

- 3.2 Upon MLGW Telecommunications Engineering Department approval of any given site a Work Order will be issued to the Utility Coordinator of Telecommunications Engineering for the coordination and inspection of each site. The following information will accompany each Work Order:
 - Work Request Number
 - Inspection Checklist
 - Site Plans
 - Structural Drawings
 - MLGW Updated List of Sites
 - MLGW Plan and Profile Drawings
 - MLGW Site Location Map
 - MLGW Tower Erection Diagrams
- 3.3 MLGW Engineering will coordinate a General Preconstruction meeting to include representatives from MLGW Telecommunication Engineering, Radio & Communication, an employed representative from the carrier, and general contractor. No preconstruction meeting shall be held prior to the approval of all construction documents for the site. No preconstruction meeting will be held without representation from the carrier and its contractors.
- 3.4 The daily outage window will be 8 AM to 5 PM, Monday – Friday. The extension of the outage window will be determined on a site-by-site basis.
- 3.5 The Utility Coordinator shall have the right to stop work at any time when he determines that an unsafe work conditions exist due to negligence of the contractor, weather, electrical system requirements, or other reason.
- 3.6 The Contractor shall supply new bolts, nuts, and palnuts for any existing ones that may be removed during installation.
- 3.7 No structural members may be removed unless indicated so on approved structural drawings.
- 3.8 All gates must be properly secured.
- 3.9 Each tower installation is subject to inspection upon completion. The Utility Coordinator of The Telecommunication Engineering Department will coordinate with the appropriate MLGW Work Center to have MLGW's linemen or contractors to climb and fully inspect the installation. If the property or the tower are destroyed or damaged during

installations the carrier will be held responsible to make all necessary repairs in a timely manner, not to exceed thirty - (30) days. The Planner Coordinator will notify The Telecommunications Engineering Department when this is complete, by returning the signed Work Order to The Utility Coordinator of The Telecommunications Engineering Department.

4. Provisioning For Climbing

- 4.1 All "Qualified Climbers" will provide documentation of required tower climbing training and climbing experience (~~i.e. copy of RMW~~) to the MLGW's Telecommunication Engineering Department. During all climbing activities, at least two (2) qualified climbers shall be present on the job site.
- One of these qualified climbers will have been a "Qualified Climber" for at least two years.
 - One employee qualified in rescue procedures and CPR.
 - A personal RF monitor shall be worn when climbing structures that may have active transmitters in the area.

5. Retirement

- 5.1. A written request must be given to MLGW Utility Coordinator when any facility is to be retired.
- 5.2 All Construction and Maintenance procedures must be followed as outlined in this specification including final inspection.
- 5.3 The tower shall be returned to "as good" or better condition than existed prior to installation.
- 5.4 No work is to commence until all material is on hand to completely restore the tower.
- 5.5 Any tower members removed or modified for installation must be replaced.

6. Liability

MLGW shall not be responsible for damage to the Lessee's equipment as a result of its normal construction and maintenance practices.