

Planning Advisory Notice

The "Planning Advisory Notice" is designed to advise and educate the many stakeholders of the industry including tower owners, carriers, broadcasters, general contractors and tower erectors. By promoting the "Planning Advisory Notice", NATE continues to pursue a culture of safety dedicated to sending every tower worker home safely at the end of the day while ensuring the proper performance of the systems upon which they work. It is the intent that each PAN will allow the stakeholders to understand that quality and safety can only truly be achieved by understanding the SOW (Scope of Work) and the standards that may apply, and how to apply these standards.

The industry has had great developments in the standards that apply to the work that is performed. Many of these standards have not had their importance communicated so that the stakeholders can utilize them to afford the proper installation, maintenance and modification to existing sites. The proper Compliance with government regulations and application of industry standards are among the demands facing tower erectors and industry professionals on a daily basis. NATE's "Planning Advisory Notice" (PAN) feature will be published in each edition of Tower Times and is designed to highlight problems that arise on tower sites that could have been avoided with proper planning. Each PAN consists of a brief synopsis of issues or concerns that are addressed by specific standards. The PAN is not intended to replace the input of a competent person for the subject matter covered; rather it is intended to highlight the standards and raise awareness for all. Currently there is a group of NATE members and friends that make up the PAN advisory group and soon we will have a means for suggestions on new topics or requests for more information on existing PAN features.

Initial PAN advisory group members are Dave Anthony (President Shenandoah Tower Service, Ltd.), John Erichsen (Principal EET PE, Chairman TIA Committee TR14), Scott Kisting (MUTI Vice President), Stephanie Brewer (MUTI CC), Dale Heath (CommScope Product Line Manager), and Todd Schlekeway (NATE Executive Director).

Anchor Bolts: Height Matters



This anchor bolt installation shows an example of dangerous stress caused by too much height.

It has become all too common during structural maintenance and inspections to discover anchor bolts extending far above the top of the foundation. TIA design standards place limits on the height to maximize the bolt capacity. If not grouted, the height of the bottom of the anchor bolt above the concrete should not exceed one bolt diameter. It is important to note that some tower manufacturers require the use of grout and the grout should be placed in accordance with these recommendations while the height of the grout should not extend beyond the limitation set by the engineer of record.

When the height limitation is exceeded the bolts are subject to bending forces and these bending forces must be evaluated in accordance with the TIA standard by a competent engineer. The bolts will have a tendency to move horizontally when



subjected to the horizontal wind forces from the tower. These forces grow quickly overwhelming the anchor bolt strength. If this condition is encountered, it is important to convey the situation to the design engineer for review. Collecting the height of the bottom of the nut above concrete is a simple act.

For example, as the photos to the right illustrate, the bolt in this installation is a 1" diameter (Photo 3). The height of the bottom of the nut is 3.5" (Photo 2), which is 3.5 times the 1" height limitation. This extension of the anchor bolts can result in stresses that greatly exceed the TIA stipulated strength.

Resolving the problem can be difficult. Lowering the tower is expensive, can damage the anchor bolts and if not done properly may lead to binding of the tower on the bolts. Adding high strength non-shrink grout is an acceptable solution if approved by a competent engineer in accordance with TIA-222-G requirements. More recently, there has been a movement to eliminate grout from installations to reduce maintenance costs. Poor grout installation and improper grout material contribute to the movement to eliminate grout. Inspection of anchor bolts once grouted is not feasible without the complete removal and replacement of the grout. In some installations, grout has contributed to localized corrosion of the anchor bolts which often goes undetected. Replacing grout with shims made of steel or other acceptable materials has also been contemplated. Using shims

allows inspection of the anchor bolts and serves as an acceptable substitute to grout. The use of shims must be reviewed by a competent engineer prior to the installation. In any event when stacking a tower the installer should confirm the placement of the leveling nut is compliant with the manufacturer specifications and the bottom of the nut should not extend more than one bolt diameter above the concrete. ■

