



PLANNING ADVISORY NOTICE

Mount Selection Considerations

Each day, our world relies more on properly functioning communications infrastructure. Often times, the mounting interface between the communications equipment and the supporting structure is overlooked. Our industry has long relied on its great contractors to solve problems and present solutions to the end users. One pertinent example is the selection of, and in many cases the procurement of, antenna mounts. As the industry has evolved, the capacity of antenna mounts is being pushed (more and more) to their respective limits. The intent of this PAN is to provide the men and women of our industry various topics to consider when faced with selecting effective mount solutions.

Telecommunication structural engineers utilize the latest techniques and tools during the design process to assure mounts are both engineered and manufactured to meet the intended use. End users tend to have vastly different loading requirements, and manufacturers are required to produce mounts to suit a wide range of applications. In fact, each site and its equipment configuration can be unique and considerably different from the other sites in a given vicinity for the same end user. The design, selection, and procurement of mounting products would be greatly simplified if this were not the case; however that is not the world we live in.

It is also important to understand the supporting structure geometry at the mount connection is often not quantifiably known. This pushes the top-tier mount manufacturers to constantly evolve and provide flexibility for their products to perform properly on structures with differing sizes and shapes. In the last several years, top-tier manufacturers have also taken an active approach by designing and documenting mounts that consider the structure's climbing facility and, if present, protecting the wire rope safety climb. Initiatives like these point to a general comprehension level that top-tier manufacturers have on the intended purpose of their products. Likewise, these manufacturers also understand that their mount products must not only support the equipment in its final position, but that this equipment must also be accessed and maintained along the way. Maintenance loads are yet another area that top-tier mount manufacturers are actively considering in their design and development criteria for their mount products.

The experience and support provided by a manufacturer is of principal importance to both the contractor who is recommending, procuring, or installing the mount as well as the end user.

Initial support must include proper documentation as well as the ability to demonstrate proficient manufacturing processes and capabilities. It is also important to select a manufacturer that has the ability to support the documentation



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requirements, install needs and carry out necessary warranty support in the future if such a need should arise.



The manufacturers' on-staff engineer must be fluent in the appropriate standards for the design of the mounts, as well as the manufacturing process.

These manufacturers shall be able to provide contractors and even end users with documentation that the design and manufacturing processes are compliant with current industry standards. Some examples include the ability to actively demonstrate compliance with ANSI/TIA 222, ANSI/TIA 322, TIA 5053, ASTM, and AISC standards. The manufacturer should support the contractor or end user's understanding of code compliance when specific codes are listed on a manufacturer's published documentation.

Top-tier manufacturers will have engineers on staff that will utilize industry standard software packages to complete 3D modeling, 3-D beam analysis and finite element analysis for validation of their products. The engineers employed by top tier manufacturers also encourage third party analysis and further validation by utilizing other engineering resources throughout the industry. In addition to engineering, the manufacturer must employ competent manufacturing and quality-control personnel utilizing computer assisted manufacturing equipment to support the manufacturing process, ensuring that the parts are accurately produced and reliable.



Many end users have created specific documentation requirements to ensure the performance of the mounts deployed for their networks. This aids in procurement as well as supporting the need to analyze the mount in the future. It is imperative that the contractors require verification that the manufacturer's documentation meets the end users' requirements, and thus the top-tier manufacturers must

be able to demonstrate the requirements are met when requested. Accurate record keeping, including revision control, by the manufacturer is also important to assist in fact-finding missions in the future in the event of data loss.

The above discussion can be boiled down into three main considerations that should be made when selecting a mount:

Constructability

Contractors must have the ability to trust that the members will fit up properly. Proper installation instruction documentation is also critical when the contractor has precious resources seeking to complete the site and move onto the next. In case of arising issues on-site it is also important to understand if the manufacturer has an engineering support team able to answer questions in a timely manner when the contractor is performing work to avoid unnecessary delays.



Structural Sufficiency

End users must have trust that the products are compliant with the standards and equipment loading configuration, and top-tier manufacturers must be able to demonstrate compliance. The manufacturer must also be able to support the contractor in meeting close-out requirements of the end user.

Serviceability

Long term maintenance needs to be a consideration for each manufacturer. The equipment of the end user is an important consideration for not only the initial installation but also future upgrades and equipment modifications. ●



(PLEASE SEE THE PAN TIF WHITE PAPER RELEASE ON THE FOLLOWING PAGE)

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TIF White Paper Release

Mount Selection Considerations

As our industry seeks to support societies ever growing desire for communications infrastructure it is becoming more common to have telecommunications equipment mounted on a structure that was not originally designed for a telecommunications application. When multiple new uses impact a structure it can be difficult to discern how to properly apply design standards when performing a comprehensive analysis of all structures impacted by the deployment of the telecom equipment.

The intent of this Telecommunications Industry Foundation (TIF) White Paper is to aid stakeholders within the telecommunications industry in understanding how to determine the intended use of the underlying structure and the proper application of engineering standards when performing a structural analysis on multiple structures with differences in their intended use. Whether it is right of way structures such as light poles or structures comprised of non-traditional materials (FRP), this white paper provides insight into which standards govern various aspects of the analysis and how to ensure that the intended use is properly accounted for.

This TIF white paper places a strong emphasis on small cell applications where the supporting structure may not have been intended for this purpose. With the rapid deployment of small cell equipment, often on structures with an intended use outside of telecom, there is often misunderstanding of how to properly apply the governing codes and standards. This results in inconsistency not only in analysis results across engineering firms, but also in different guidance amongst jurisdictions and regulatory bodies.

It is believed that this white paper will help people involved in the planning, deployment, regulation, and maintenance of telecommunications equipment to assess structures for the application of this equipment and ensure that the intended use is properly considered.

The working group of the Telecommunications Industry Foundation (TIF) that developed this white paper included members from multiple industry stakeholders. Engineers, structure owners, end users, and manufacturers came together to pool their knowledge for the benefit of the industry. This paper is meant to generate a dialogue between various stakeholders in the industry. TIF encourages feedback and input to update the paper as circumstances arise. This paper intends to do the following:

- Outlines a logical approach to the determination of the governing design standards to be utilized in the design of telecommunications installations and the analysis of the underlying multi-use structures.
- Guides a reader on how to determine the intended use of the structure.
- Discusses the important role of the structure owner in defining the underlying use of the structure.
- Details the importance of the ANSI/TIA 222 Standard to quantify the telecommunications infrastructure and how to relate this information to be used in other standards based on the intended use of the structure.
- Communicates the need for the engineer to be knowledgeable and apply not only the ANSI/TIA Standard but also the other standards that may apply to the intended use of the structure while understanding the owner's designation.
- Finally, this white paper outlines some example workflows based on telecommunications infrastructures that have varying intended uses.

"As our industry sees an ever-increasing deployment of small cell structures to support the 5G network, this white paper provides timely and expert guidance from practicing professionals within the wireless industry. This well-written guide provides a wealth of information and advice useful to engineer, network operators, owners, and jurisdiction authorities. I recommend this white paper as a useful guide to those professionals tasked with the design and deployment of 5G systems." David Hawkins – Paul J. Ford and Company

This document is available for download from TIF Website.

The Board of Directors for TIF and this white paper committee, support feedback to bring to industry a means for educating and for information sharing through a portal on its website, tifonline.org. ●

