



PLANNING ADVISORY NOTICE

Is This Mount “Man-Rated”? Understanding Fall Protection Requirements and TIA Maintenance Loads

At some point in your career, you have likely heard, asked, or been asked the question:

“Is this mount man-rated?”

Most people understand the intent behind the question. They want to know whether the steel assembly supporting telecommunications equipment is structurally capable of supporting the weight of a tower technician, their tools, fall protection equipment, and potentially associated rigging loads.

The question itself is reasonable because it is rooted in a desire to work safely. However, the term man-rated is not a term that accurately reflects how current regulations, standards, and industry practices address worker loading, fall protection, or structural capacity. More often, it attempts to simplify several distinct engineering and safety concepts into a single phrase and that phrase creates confusion in the trained, competent, and skilled workforce that enables telecommunications.

This article explains the differences between ANSI/ASSP Z359 fall protection requirements, ANSI/TIA maintenance load provisions, and ANSI/ASSP A10.48 construction planning requirements. Understanding these distinctions is critical for owners, engineers, manufacturers, contractors, and anyone responsible for planning or performing work on telecommunications structures.

The most important takeaway is that safe, quality work begins with proper planning. ANSI/ASSP A10.48 requires the development of a construction plan under the supervision of a qualified person. That qualified person may engage a qualified engineer, as needed, to evaluate the structure in accordance with ANSI/TIA-322 and determine whether the tower, mount, or supporting structure can safely support the loads defined within the construction plan.

Requirements and the Origin of “Man-Rated”

OSHA and ANSI/ASSP Z359 requires employees working at elevation to be protected from falls through compliant fall-protection systems.

When discussing the term man-rated, many people are referring to the requirements for fall-protection anchorages. Anchorages used as part of a personal fall arrest system must be capable of supporting **at least 5,000 pounds per attached worker**, unless designed as part of a complete engineered fall arrest system.

A competent person must determine:

- The type of fall protection required
- Appropriate attachment locations
- The suitability of anchorages
- Whether the proposed system provides adequate worker protection
- Access and egress
- Rescue considerations

Because of the 5,000-pound anchorage requirement, many individuals incorrectly assume that a mount must be capable of supporting a 5,000-pound load to be considered safe for personnel access. In reality, anchorage requirements and a mount's structural maintenance capacity are two entirely different engineering considerations.

Meeting OSHA Requirements

Meeting OSHA requirements on a telecommunications structure typically involves:

1. Developing a compliant construction plan under ANSI/ASSP A10.48.
2. Identifying fall hazards associated with the specific scope of work.
3. Determining appropriate anchorage locations through the competent person.

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4. Engaging a qualified engineer when structural evaluation is necessary. The need for which is determined by the qualified person as a part of the ANSI/ASSP A10.48 Construction plan review.
5. Verifying that proposed fall protection systems and anchorages are suitable for the anticipated loading conditions.

The focus is not on whether a mount is “man-rated.” The focus is on whether the overall work plan provides adequate fall protection and whether the structure can support the loads generated by the planned activity. Proper focus allows for a safe working environment as hazards are assessed as a part of the scope of work, construction plan, and site specific considerations as well as the equipment and personnel deployed.

TIA Maintenance Loads Are Different from Fall Protection Requirements

It is critical to understand that **ANSI/TIA-222 maintenance loads are entirely separate from OSHA or ANSI/ASSP fall-protection requirements.**

Maintenance work performed on telecommunications structures is planned under ANSI/ASSP A10.48 and can utilize structural analyses developed in accordance with ANSI/TIA-222 and ANSI/TIA-322.

The maintenance load provisions currently contained within ANSI/TIA-222-I originated through extensive discussions among contractors, engineers, mobile network operators (MNOs), tower owners, and equipment manufacturers.

Prior to TIA-5053, there were no standardized maintenance load calculations specifically intended to convey information to contractors assisting them in their planning for working with mounts during maintenance activities.

During development of these standards, stakeholders considered whether mounts should be designed to satisfy fall-protection anchorage requirements. Ultimately, the industry determined that such an approach was impractical.

Several questions immediately arose:

- What specific scope of work is being performed?
- Is the project an antenna swap, mount modification, or antenna addition?
- What type of fall protection system will be used?
- What climbing path will technicians follow?
- What rigging methods will be employed?
- What training and equipment will personnel use?
- What unforeseen conditions and project-specific variables that may not be immediately apparent?

The answers varied significantly from project to project.

A mount that could be “rated” for one scope of work might be unsuitable for another. Any meaningful personnel rating would require defining:

- The specific scope of work
- Fixed mount loading (in other words equipment could not be changed over time)
- The fall protection system
- Rigging forces
- Worker positioning
- Equipment configuration

The resulting rating would only apply to that exact scenario. Such a requirement would impose an unreasonable burden on both contractors and manufacturers by requiring everyone to perform work in the same manner using the same equipment. It would also prevent the industry from meeting the primary purpose of supporting antennas that must periodically change to keep pace with technological advancements. In addition, designing mounts to accommodate an additional 5,000-pound load may result in a more robust and costly structure, potentially applying additional, yet unnecessary, loads on the supporting structure.

As a result, the industry developed maintenance load criteria instead.

Understanding Maintenance Loads

Maintenance loads are design loads applied during structural analysis to convey information that can be used by a competent contractor to plan their work. These loads are intended to simulate personnel working on or traversing the mount.

Two maintenance load components are utilized:

LV Maintenance Load

LV = 250-pound concentrated vertical load

This load is applied:

- One location at a time
- At the center of each horizontal member
- Only on structural members supported at both ends

For example, if a sector frame contains upper and lower horizontal members, each of those members is independently checked with a 250-pound concentrated load applied at mid-span.

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Important Exception

Tie-backs and stiff arms are excluded from this requirement.

However, the absence of a published capacity on a tie-back does not automatically mean that work cannot be performed from it. It simply means additional planning, evaluation, and engineering consideration may be required.

LM Maintenance Load

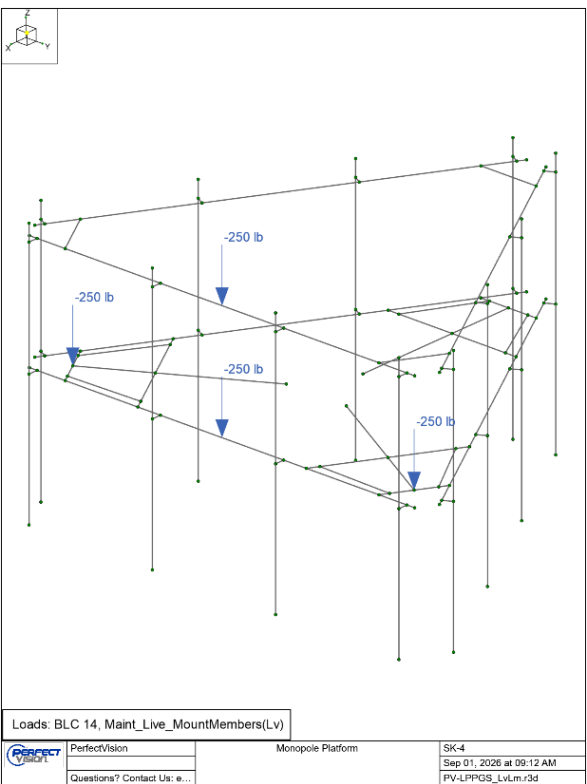
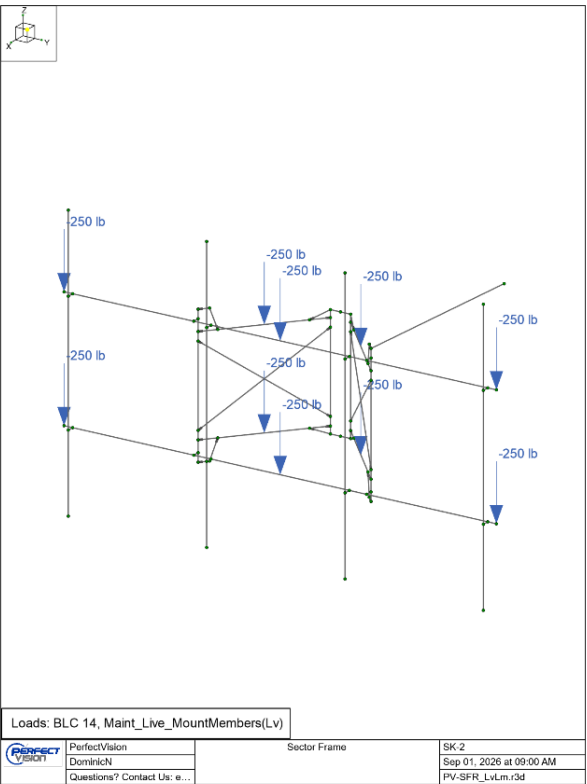
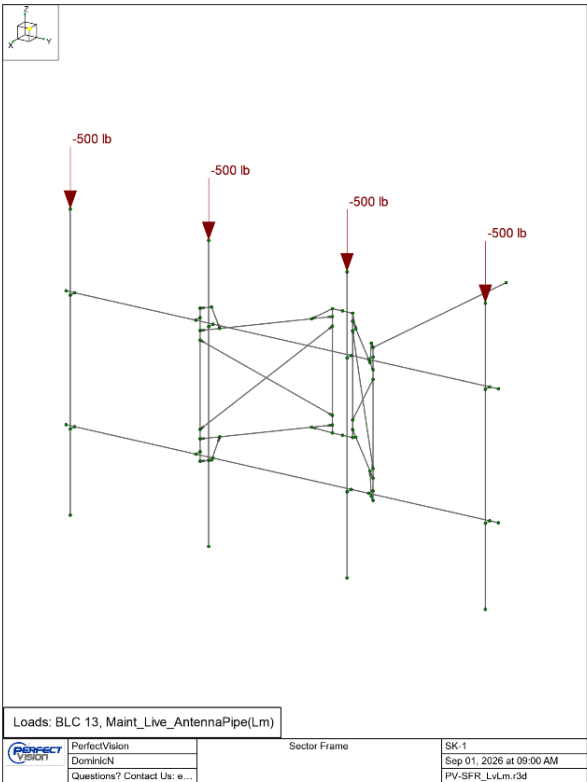
LM = 500-pound concentrated vertical load

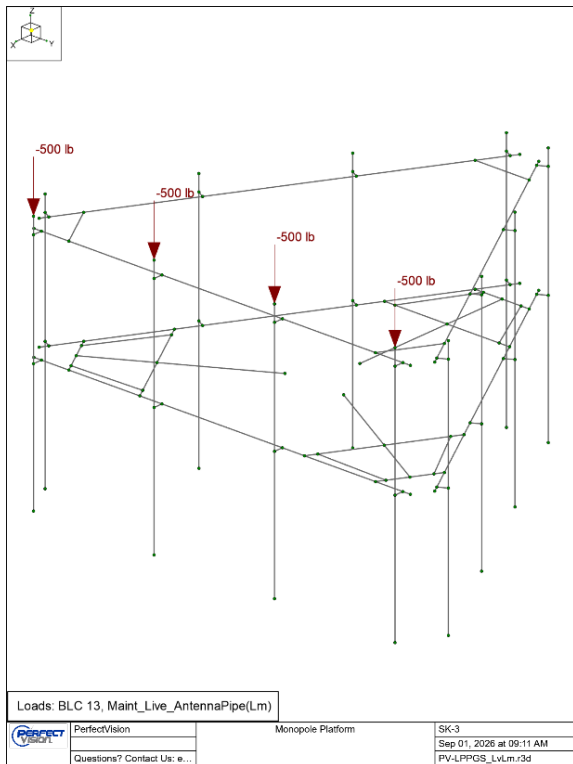
This load is applied:

- One location at a time
- At each mounting pipe location

The purpose of LM is to evaluate the overall structural stability and global performance of the mount under this maintenance load case.

Figures 1-4 Conceptual Representation of TIA Maintenance Loads (LV and LM, respectively)





Key Point: Maintenance loads are simulated design forces conveyed as a part of a structural analysis. They are not fall-protection anchorage loads and should not be interpreted as OSHA fall-arrest capacities.

Maintenance Load Combinations

Engineers do not simply design structures based on anticipated loads. They also incorporate safety factors to account for uncertainty and variability.

Maintenance loads are incorporated into ANSI/TIA-222-I load combinations using a 50% increase within the applicable strength limit state load combination. These combinations include both LV and LM. However, ANSI/TIA-222-I does not provide maintenance load combinations for certain mount classifications, including Side Arms and Standoffs. When these mount types are encountered, additional planning and engineering review may be necessary.

ANSI/ASSP A10.48 allows the qualified person to engage a qualified engineer who can determine whether the structure can safely support the loads associated with the planned work even when published maintenance load data is unavailable. The qualified person must create their plan and convey this to the qualified engineer through an ANSI/ASSP A10.48 construction plan. The qualified engineer then can utilize ANSI/TIA 322 to review and provide feedback. Qualified engineers should NOT be creating construction plans unless they are engaged as a supervising engineer as defined in the ANSI/TIA 322!

Maintenance Loads and Fall Protection Serve Different Purposes

That distinction is intentional. Maintenance loads are communicating an analysis load case that evaluates temporary structural loading associated with servicing equipment. Fall protection protects workers from falls. Technicians performing maintenance activities must utilize separate fall-protection systems independent of maintenance load criteria. The maintenance loads are to support the competent person in their planning. This planning must have the support of a qualified person who can review and determine if it is necessary to engage a qualified engineer.

The competent person is responsible for developing a fall-protection plan that addresses:

- Scope of work
- Worker training
- Anchorage locations
- Fall arrest systems
- Positioning systems
- Site-specific hazards

Some manufacturers now provide engineered anchorage locations as part of their products. Understanding whether and how those features may be incorporated into a personal fall-protection system remains the responsibility of the competent person developing the ANSI/ASSP A10.48 plan. It is important to recognize that engineered anchorage systems are subject to specific design, installation, and performance requirements that must be fully understood and adhered to prior to implementation.

Responsibilities Across the Industry

Owners

- Procure mounts that comply with current standards.
- Ensure structural analyses incorporating maintenance loads in accordance with ANSI/TIA-222 are available to general contractors that are performing work on the mounts.
- Provide support when a contractor's qualified person identifies that the ANSI/ASSP A10.48 construction plan is a class IV which requires the review of a qualified engineer.

Engineers

- Design structures compliant with current code requirements.
- Clearly communicate maintenance load capacities and limitations.

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- Provide analyses consistent with ANSI/TIA-222.
- Review ANSI/ASSP A10.48 construction plan ensure the requirements of ANSI/TIA 322 are met.
- Only create ANSI/ASSP A10.48 construction plans if you are engaged as a supervising engineer as defined in ANSI/TIA 322.

Manufacturers

- Provide information consistent with TIA-5053 requirements.
- Communicate installation requirements and mount capacities.
- Publish special installation instructions where necessary.
- Design products that account for existing climbing facilities and safety climb systems, ensuring that the proposed installation does not impair their functionality, accessibility, or structural integrity.

General Contractors

- Develop construction plans in accordance with ANSI/ASSP A10.48.
- Maintain access to mount analyses and engineering documentation.
- Engage qualified engineers where required under ANSI/ASSP A10.48, who will use the ANSI/TIA 322 to review the construction plan.
- Confirm work can be safely performed in accordance with the construction plan.

Four Questions Every Contractor Should Ask

When replacing equipment or modifying existing installations, proactive planning is always preferable to arriving on-site and discovering problems after work begins.

1. Am I changing the type, size, or quantity of components on the mount?

If the work is not a like-for-like replacement, an engineer should determine whether the modification constitutes a changed condition under the International Existing Building Code (IEBC). If so, a new structural analysis may be required.

2. Do I have adequate headroom above the mount to rig to the structure?

If sufficient headroom is unavailable, rigging may need to be attached directly to the mount, requiring additional evaluation and planning.

3. Do I need to engage a qualified engineer?

This determination depends on the weight of the component and rigging equipment involved.

If the combined weight does not exceed 200 pounds, the Class 4 exception contained within ANSI/ASSP A10.48-2023 may apply. Regardless, all work should be planned through an ANSI/ASSP A10.48-compliant construction plan.

4. Do I have proper fall-protection equipment and training?

The competent person must develop a fall-protection plan that includes:

- Fall arrest anchorages
- Positioning anchorages
- Access methods
- Worker training requirements
- Site-specific hazard mitigation
- Rescue plan

Conclusion

While the question, “Is this mount man-rated?” is understandable, it simplifies a subject that is more nuanced. It also risks overlooking the critical role that competent persons play in applying established standards, evaluating site-specific conditions, and developing safe, practical construction plans. This over-simplified question can also diminish the importance of the standards that allow effective communication between all stakeholders to allow for quality work to be performed in a safe manner.

A mount that is not “man-rated” in the OSHA anchorage sense does not automatically mean that personnel cannot safely work on it. Likewise, compliance with ANSI/TIA maintenance load provisions does not automatically make a mount suitable as a fall-protection anchorage.

The telecommunications industry has evolved toward a planning-based approach that relies on communication among owners, manufacturers, qualified engineers, contractors, qualified persons, and competent persons.

Safe work depends on understanding:

- What work is being performed.
- How the work will be performed.
- Whether maintenance loads have been evaluated.

- Whether a qualified engineer must review the work.
- Whether appropriate fall-protection systems have been planned.

ANSI/ASSP A10.48 provides the framework for this planning process, while ANSI/TIA-222, ANSI/TIA-322, and TIA-5053 provide the structural tools necessary to evaluate structural capacity. Together, these standards allow the industry to safely perform construction and maintenance work without relying on the oversimplified concept of whether a mount is or is not “man-rated.”

This PAN is intended to help the industry move beyond oversimplified terminology and adopt standards-based approaches that clearly define and support the roles and responsibilities of all stakeholders. ●

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