

SafeRack Loading Platforms Better by Design

WHITE PAPER

2025

Safety & Productivity working in harmony

DESIGN / INTEGRATED / COMPLIANT

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SafeRack Platform Design

What Makes a Great Loading Rack?

- Rack foundation
- The loading rack itself
- Material of construction
- Bump-out areas (skid,eyewash,tools,etc)
- Access and egress (accessibility)
- The truck, hopper, ISO container or rail car spotting area
- Operator working area
- Canopy (complete, future expansion)
- Gangway
- Cage
- Loading arms
- Lighting
- Wash stations
- Operator control room or shed
- Pipe Supports (overhead, underneath platform)
- Grounding System
- Tool box container
- Walk surfaces
- Safety gates
- Interlocking audio-visual alarms
- Venting/extraction
- Fixed point overhead lifeline at a gangway/cage spot

Well, in our opinion, the answer is ***“all of the above, working together in harmony as an integrated solution”***.

With a workforce in excess of 500, each with greater than 5 years service, we bring over 2500 years of experience to each project that we execute on your behalf. As Steve Jobs said, “Do not try to do everything, just do one thing really well”.

Today, we are going to begin with the basis of every great Loading System, and that is the platform itself. As all good cooks know, only good ingredients will result in a perfect outcome.

Loading Rack or Platform

When our colleagues look at a new project, what is running through their mind?

We recently asked this question of Raquel Strickland, SafeRack Director of Structural Engineering, who's been designing loading platforms for a wide variety of markets and applications for over 30 years and she stated:

"Every project we do is a truck, rail, ship or barge loading or unloading situation. The repetitiveness of our projects gives us insight to what really works well and what does not. A local fabricator or engineering firm might do a loading rack 1 in every 1000 projects, they do not have the experience to learn all the nuances of designing racks specifically for loading/unloading."

Put it simply, wash, rinse, repeat. Each time, learn from the last project to provide you with the best possible solution.

Example:

A client asked for the longest track with tracking wings - their main concern was not having swing gates. By the time the job got to SafeRack, they had designed the rack around 14'-0" long gangway tracks. They did not take into account the length of railcars. There was not enough tracking for the initial railcar lengths provided to us. The longer cages might enclose the hatch, but the crash box opening might not be in the tracking gangway range, so the operator might have to climb over the rail to get into the crash box. The platform was initially designed with a W beam. They modified the gangway track areas with C channel which has led to a design that will either be difficult to fabricate, install or both, but definitely has the potential for field problems or higher installation cost. This is what we can predict and prevent.

Why should you let us build your platform ...

Raquel stated, "We design based on vehicle length (max - min) allowing us to keep the bays within a rack repetitive, which allows us to maximize spans, minimize foundations, incorporate fabrication processes that minimize the chance for mistakes and installation that then take less time and pain."

"We also design the racks to integrate the accessories (loading arms, operator sheds, piping) for a rack that will remain clutter free during operations."

"And finally, all racks will be reworked eventually, either with new products, operations, vehicle lengths, extended or shortened. We have learned to design racks that are easily adaptable. When change comes it will not be a situation where the whole rack needs to be demolished just to start from scratch."

William McIntosh, SR structural engineer also stated “Letting SafeRack build the platform streamlines the design process; we design for site specific load requirements; the platform is designed, engineered and manufactured by industry experts; quicker onsite delivery times; easier to install; better fit-up; and longer equipment lifespan.”

SafeRack’s design engineer, Kyle Lavoie, stated that having SR design platforms ensures equipment compatibility and removes the chance of any miscommunication between 3rd party vendors/contractors, reducing number of revisions and improving lead times.

Why customers should choose a fully integrated, engineered site specific safe access platform solution from SafeRack versus outsourcing the structural steel. Well...it all starts from the bottom up.

The Foundation:

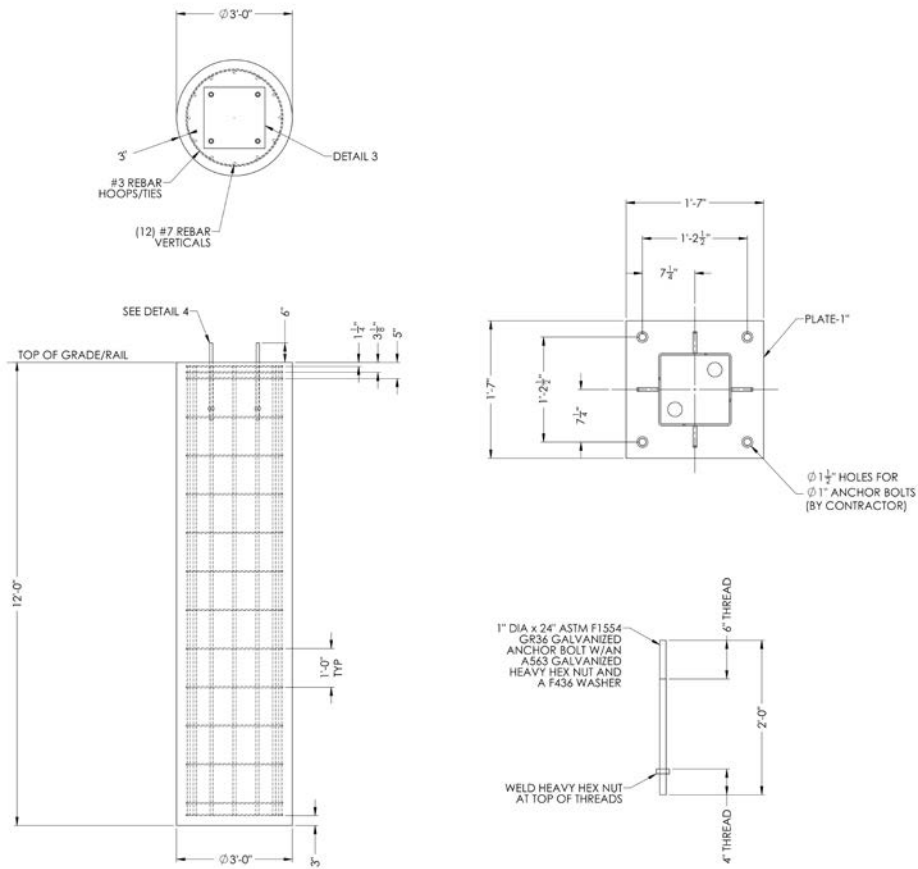
- In industrial and commercial applications such as access platforms, mezzanines, maintenance stands, and other elevated walkways the foundation design is critical for safety, stability, and compliance.
- The appropriate foundation type depends on factors like load requirements, soil conditions, and environmental exposure.

SafeRack Platforms are designed utilizing either a caisson or spread footer

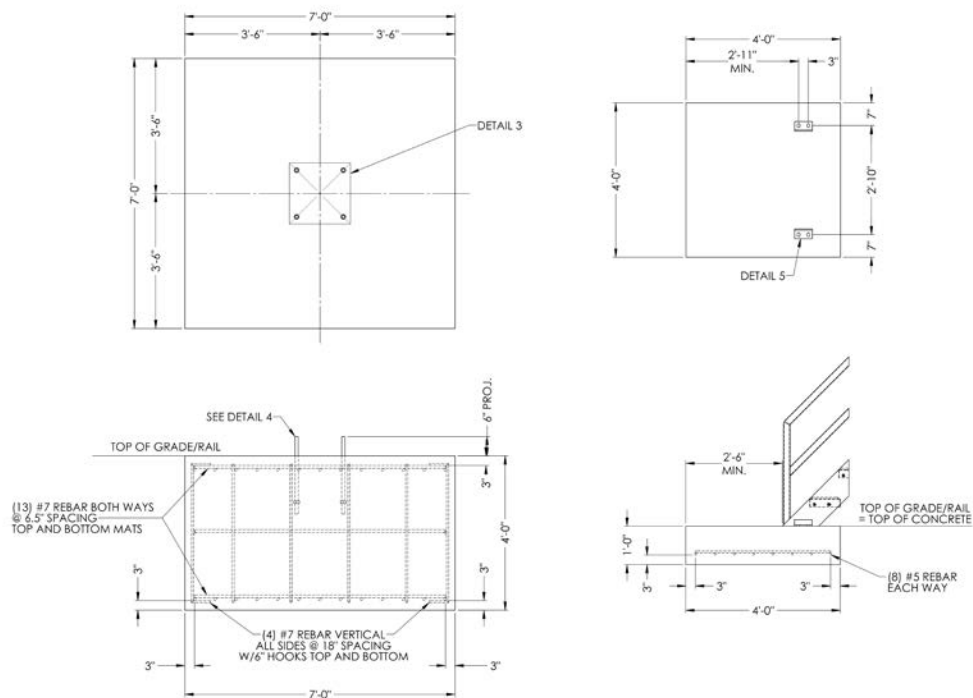
Caisson and Spread Footer

- **Caisson** - a cylindrical concrete pier typically drilled deep into the ground.
- **Spread footer** - a spread footer can be customized into various shapes, but SafeRack standards are typically square or rectangular and are designed to spread the load from the structure to the soil below.
 - By increasing the contact area, they reduce the pressure on the soil, which is crucial for stability and preventing settlement.
- Optional **Helical pier** foundations can also be used to support structures in areas with challenging soil conditions (soft, loose, unstable) or where traditional foundations are not feasible.

Caisson



Spread Footer



Foundation Considerations

- **Soil Testing:** Perform geotechnical soil analysis to determine appropriate type.
- **Codes and Loads:** Must comply with local building codes, OSHA, and ASCE/ANSI load standards.
- **Environmental Factors:** Wind uplift, seismic activity, and freeze-thaw conditions may affect design.

Foundation Chart

Foundation Type	Typical Use	Advantages	Limitations /Considerations	Installation Complexity	Installation Complexity
Concrete Slab-on-Grade	Indoor platforms, good soil	Simple, widely used, good for anchoring	Needs proper thickness & reinforcement	\$ \$	 
Isolated Concrete Footings	Outdoor columns, moderate loads	High point-load capacity, customizable	Requires excavation; more time-consuming	\$ \$ \$	  
Pile Foundations	Poor soil, heavy-duty applications	Supports very heavy loads, deep stability	Expensive, needs geotechnical & specialty equipment	\$ \$ \$ \$	   
Helical Piers	Light/moderate loads, poor soil, temp use	Fast install, minimal excavation, reusable	Limited in hard/dense soils or very high loads	\$ \$ \$	 
Precast Blocks/Ballast	Temporary/movable platforms	No excavation, quick deployment, portable	Load limits; may shift if not properly stabilized	\$ \$	
Grade Beams /Combined Footings	Complex loading or tight column spacing	Spreads loads, good for uneven soil	Requires engineering and more formwork	\$ \$ \$	  
Steel Frame Foundations	Rooftop or elevated floor systems	Integrates with existing structure	Needs structural tie-in and coordination	\$ \$ \$	  

Why SafeRack

Single-Source Accountability

When you partner with SafeRack, you're not piecing together a system from multiple vendors. We take full responsibility for the entire equipment package—design, engineering, fabrication, and performance. This ensures that the platform functions as intended within your defined operational and safety parameters, eliminating the finger-pointing and delays that often result from outsourced, multi-party projects.

Engineered for Your Site

Our platforms are not one-size-fits-all. Each system is designed and engineered specifically for your facility, process, and compliance requirements. This tailored approach ensures better performance, safer operation, and a perfect fit from day one—without the compromises that come with generic or modular piecemeal components. Hidden engineering costs associated with piecemealing a project together are often overlooked. When trying to stay within a budget why not use a resource that has decades of experience of rack integration? SafeRack has provided thousands of racks through the years and have encountered and solved many of the everyday design and construction hurdles. Customers aren't just paying for our equipment, they are buying solutions that have been refined over the years to be the most comprehensive solution available on the market today.

Seamless Integration with Equipment and Process Flow

We don't just build platforms—we design systems that work with your equipment, vehicles, and personnel workflows. This includes integration with loading arms, fall protection systems, piping layouts, and environmental conditions, providing a streamlined and operationally efficient access solution.

Code Compliance and Safety Assurance

Our in-house engineering team ensures that every structure meets or exceeds OSHA, IBC, and other relevant regulatory standards. By owning the design and execution, we ensure consistent compliance across all project elements—a risk that increases significantly when using outsourced or off-the-shelf structural components.

Reduced Project Risk and Installation Delays

With SafeRack managing the entire scope, you eliminate the coordination and misalignment issues that occur when trying to piece together separate steel fabricators, designers, and installation contractors. We deliver complete, ready-to-install systems with clear documentation and pre-verified fit and function—saving time and reducing cost overruns.

Long-Term Value and Support

Your investment in a SafeRack system is backed by our ongoing customer support, parts availability, and service. If future changes or expansions are needed, our team can easily adapt the system thanks to centralized design records and consistent engineering practices.

Fundamentally what should a platform provide?

- Comply with local building codes, OSHA, and ASCE/ANSI load standards
- Hold up to environment factors - Wind, seismic, frost line
- Allow for safe access and egress
- Efficient loading/unloading of product
- Provide shelter from the elements (sun, heat, rain, snow)
- Have proper illumination to perform job duties
- Accommodate all accoutrements required for job function

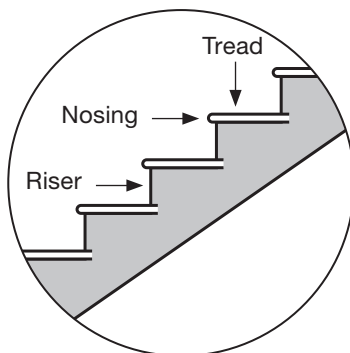
Compliance with Peace of Mind

OSHA Requirements

- Proper Guardrails: OSHA-compliant handrails (42" high), midrails, and toe boards to prevent falls.
- Safe Access: Stairs and ladders with consistent riser/tread dimensions, handrails, and non-slip surfaces.
- Adequate Clearance: System Headroom and space for workers to move and operate without risk of injury.
- Guarding Openings: All platform edges, hatches, and floor penetrations must be guarded or covered.
- Harness Anchor Points: Where fall protection PPE is required, anchor points must be certified and placed strategically.
- Safe Walkways: Non-slip, gritted flooring; clearly marked walking paths.

Stairs

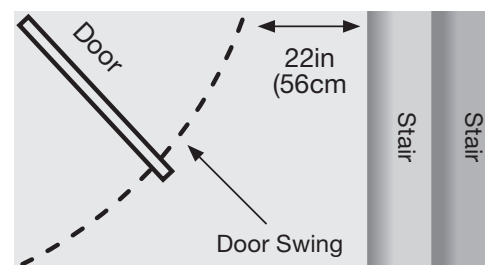
- Minimum tread width 22" (56cm)
- Minimum tread depth 9.5" (24cm)
- Minimum riser heights 4" to 7" (10.16cm to 17.78cm) on an IBC stair
- Note: Our standard "behind the gate" stair units are built on a 45 degree angle and utilize a 9" tread riser



Handrails

- SafeRack handrails are designed to hold 200 lb. lateral load, with less than a >19" gap

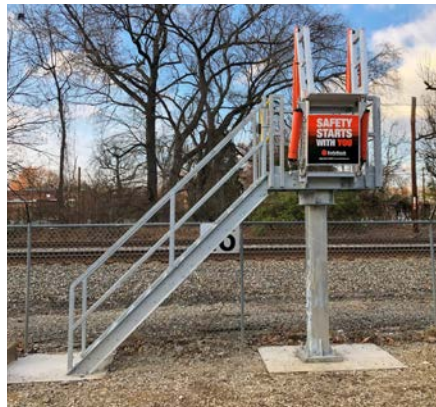
Minimum clearance on stair landing from door is 22" (56cm)



Conclusion

- An integrated solution
- Meets all relevant codes and standards
- Combines safety with productivity - clutter free operation
- Reduced lead times means you will be making profit sooner
- Ease of installation
- Integrates with all loading accessories
- Future proof as site needs change over time
- Supported by a team of professional and experienced Loading Rack experts







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