

Rack Inspection Report

[REDACTED]
[REDACTED] Facility
[REDACTED]

3P Rack Inspection Program Overview

The primary goal of 3P Storage Solutions' Rack Inspection Program is to promote and maintain safe working conditions in warehouse environments. Rack safety is assessed based on the following key factors:

- **Structural Integrity**
- **Product Application**
- **Rack Loading / Product Interface**
- **Fasteners**
- **Missing Components**
- **Modifications**

Structural Integrity

Storage rack systems, like any structural component, rely on their original shape and form to maintain load-bearing capacity. When deformed—especially at stress-critical areas like corner radii—the structural integrity is compromised. Conditions that may indicate reduced structural capacity include:

- Sheared anchors
- Deformed columns or bent struts
- Broken welds
- Excessive beam deflection
- Bent or missing beams
- Missing beam studs, bolts, or load locks
- Dislodged or bent crossbars
- Missing protective elements above tunnel bays
- Unapproved attachments or welds on rack structures

Damage typically occurs incrementally rather than suddenly, making repeated minor impacts just as significant as major collisions. While a severely bent frame leg may be obvious, even "minor" dents can critically reduce the structure's rated load capacity—especially if future loads exceed the current demands.

Conclusion: The preliminary inspection at [REDACTED] revealed multiple damaged uprights and beams, likely caused by forklift impacts.

Recommendation: Repair or replace all damaged components.

Product Application

Each rack type is designed for specific material types. As businesses evolve, so do storage needs—what was appropriate for one type of palletized product may not suit another.

Conclusion: [REDACTED] was found to be using selective rack appropriately for palletized loads.

Recommendation: None.

Rack Loading / Product Interface

This part of the inspection assesses load placement and weight distribution. Issues identified may include:

- Improperly positioned loads
- Overloaded beams
- Excessive deflection
- Unapproved additions (e.g., mezzanines)
- Center-loading in dual-pallet configurations

Overloading can occur either by exceeding the total rated capacity or by “point loading,” where weight is unevenly distributed, concentrating stress in one area. Warehouse environments often lack immediate visibility into pallet weight, increasing the risk of overloads.

Conclusion: No loading issues were found during the [REDACTED] inspection.

Recommendation: None.

Fasteners

Fasteners—such as nuts, bolts, anchor bolts, load locks, and snap locks—are critical for maintaining rack stability. These components may loosen or become damaged over time. While load locks and snap locks don't carry weight, they prevent beams from disengaging during loading and unloading.

Anchor bolts are especially vulnerable to forklift impact. In non-seismic zones, missing or sheared bolts can typically be replaced by installing a new bolt in the secondary hole of the footplate. In seismic zones, modifications require engineering approval.

Conclusion: Several deficiencies were noted in fastener systems at [REDACTED].

Recommendation: Install replacement anchors on uprights where bolts are missing or sheared.

Missing Components

Accessories designed to enhance rack safety and functionality—such as wall ties, crossbars, mesh decking, pallet stops, and cross-aisle ties—may be missing or damaged. These components are often overlooked but are critical in preventing product falls, especially in tunnel bays.

Conclusion: No missing components were found during the [REDACTED] inspection.

Recommendation: None.

Modifications

Unauthorized modifications can compromise the structural integrity of a rack system. Welded additions—regardless of their size—can damage rack members or introduce unanticipated stress. Improperly installed repair kits, such as those lacking splice cuffs or backer columns, also present significant concerns.

Conclusion: Some unapproved modifications were observed at [REDACTED].

Recommendation: Replace any welded beams or uprights that were altered without engineering oversight.

General Notes

Due to the age and potential undocumented modifications of many rack systems, not all deficiencies may be detectable through visual inspection alone. 3P Storage Solutions does not guarantee the structural performance of a rack system or this inspection process.

Important: Any racks identified with deficiencies should be taken out of service until the issues are fully resolved.

Disclaimer:

This report is a general overview of 3P Storage Solutions' inspection criteria. It is not a substitute for stamped engineering drawings. All inspections should be performed by trained personnel, with corrective action executed by qualified rack repair contractors in coordination with the inspector.

I certify that this inspection was performed to the best of my ability based on visual assessment and accessible areas.

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Racking Damage Assessment

Section A

Storage room by northern shipping & receiving docks.

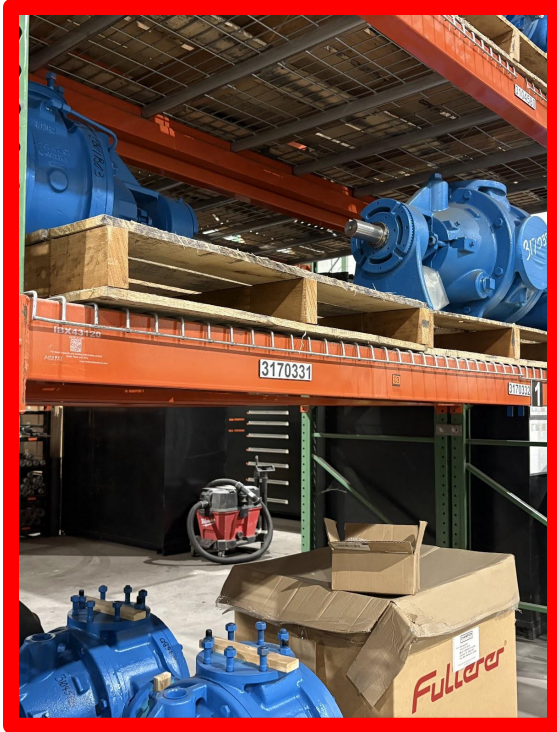


Uprights: Husky IU24 (16'-0" H × 42" D, 3" × 3" post)

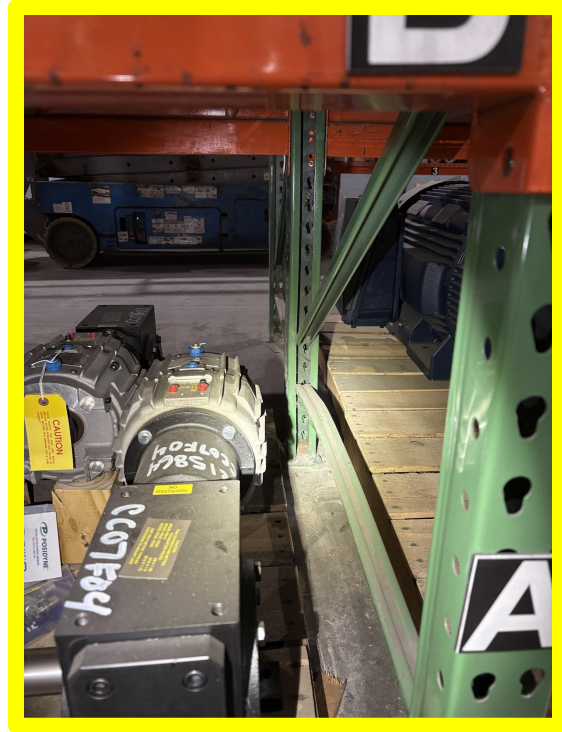
Beams: Husky IBX43120 (10'-0" L × 4.3" H)

3P™ STORAGE SOLUTIONS

PROTECT. PREVENT. PERFORM.



Row 1CB, Bay 1
Beam deflection (Greater than 1/180 beam length) from overloading ¹



Row 1CB, Bay 1
Damaged Horizontal Brace ²



Row 1CB, Bay 5
Damaged Horizontal Brace ²



Row 1CB, Bay 5
Upright Missing Anchors ⁴

3PTM STORAGE SOLUTIONS

PROTECT. PREVENT. PERFORM.



Rows 1CC & 1CB
Longitudinal flue space less than 3"
minimum between rows (NFPA 13) ⁸



1CC, Bay 5
Upright Missing Anchors ⁴



1CC, Bay 4
Upright Missing Anchors ⁴



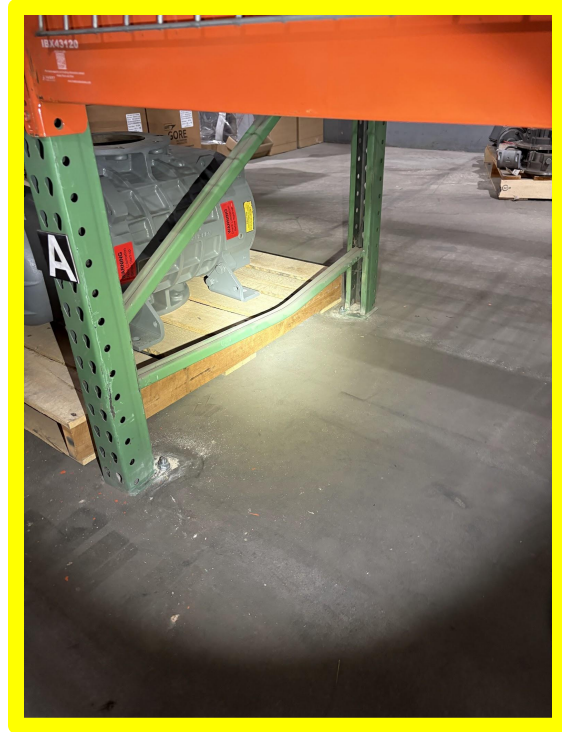
1CC, Bay 4
Damaged Beam ³

3PTM STORAGE SOLUTIONS

PROTECT. PREVENT. PERFORM.



Ensure 18" minimum clearance between top of palletized load and sprinkler deflectors (NFPA 13) ⁷



1CE, Bay 2
Damaged Horizontal Brace ²



1CE, Bay 3
Beam Damage ³



1CE, Bay 3
Upright Missing Anchors ⁴

3PTM STORAGE SOLUTIONS

PROTECT. PREVENT. PERFORM.



1CE, Bay 4
Upright Missing Anchors ⁴



1CE, Bay 5
Upright Missing Anchors ⁴



1CE, Bay 5
Upright Missing Anchors ⁴



Ensure 18" minimum clearance. Loads should be distributed evenly across the full depth and width of the beam pair ⁶



Missing Safety Clips ⁵

Citation Appendix

Each finding in this report carries a superscript numeral corresponding to an entry below. Entries identify the standard, section, and the requirement to which the observed condition relates.

Structural findings — ANSI/RMI MH16.1

1. Beam deflection exceeding L/180

ANSI/RMI MH16.1 — §4.1 (2023)

The standard places responsibility on the owner to maintain the structural integrity of the installed system, including prohibiting overloading of any individual pallet position or of the rack system overall. Beam deflection measured in excess of 1/180 of the clear span under load indicates loading beyond the design assumption for that level, and is treated in this report as an overloading condition rather than a manufacturing defect.

Measurement criterion: maximum permissible deflection = clear beam span ÷ 180, measured under load at midspan.

2. Damaged upright bracing

ANSI/RMI MH16.1 — §4.4 (2023)

Where visible damage is present, the standard directs that the affected portion of the rack be isolated immediately and evaluated by a storage rack design professional. Damaged structural components are to be unloaded and then repaired or replaced as directed by that professional, so that the system is restored to no less than its original design capacity. Diagonal and horizontal bracing members are structural components of the upright frame; damage to them reduces frame capacity irrespective of the condition of the columns themselves.

3. Damaged beam

ANSI/RMI MH16.1 — §4.4 (2023)

As above. Deformation, cracking, tearing, or denting of a horizontal load-supporting member reduces its load-carrying capacity. The affected bay is to be isolated and evaluated before being returned to service.

4. Missing floor anchors

ANSI/RMI MH16.1 — §4.2 (2023)

The standard requires that the base of every column be furnished with a column base plate and that all rack columns be anchored to the floor. Anchor quantity, size, and embedment are determined by the rack design professional to resist the applicable forces, including uplift from impact and, where applicable, seismic demand. A column lacking its specified anchors does not develop the base fixity assumed in the frame design.

5. Missing beam connection safety clips

ANSI/RMI MH16.1 — §4.4 (2023)

The standard requires that beams subject to machine loading be fitted with connection locking devices or bolts able to resist an upward force of 1,000 lbf (4,450 N) per connection without failing or disengaging. The locking device prevents beam dislodgement from upward impact during pallet placement or retrieval. A connection missing its locking device does not meet this requirement regardless of the condition of the beam or the column.

Criterion: 1,000 lbf (4,450 N) uplift resistance per connection.

6. Uneven load distribution across the beam pair

ANSI/RMI MH16.1 — §4.1 (2023)

The standard directs owners to ensure that pallets are correctly placed onto load-supporting members in a properly stacked and stable position, and that goods on each pallet are themselves properly stacked and stable. Rack beam capacities are published on the basis of a uniformly distributed load applied across the full depth and width of the beam pair. Concentrated, offset, or single-beam loading produces bending and torsional demands not accounted for in the rated capacity, and the load application drawings furnished with the installation define the permissible configurations.

Fire protection findings — NFPA 13

ANSI/RMI MH16.1 does not address fire protection. The following conditions are cited under NFPA 13 and, where applicable, OSHA.

7. Clearance between top of storage and sprinkler deflectors

NFPA 13, Standard for the Installation of Sprinkler Systems — storage provisions

OSHA 29 CFR 1910.159(c)(10)

A minimum of 18 inches of clear space is required between the top of stored material and sprinkler deflectors, so that discharge is not obstructed. OSHA states this requirement independently of NFPA 13, which makes it directly citable as a federal regulatory requirement rather than solely as consensus practice. The applicable NFPA 13 edition is stated on the report cover page.

8. Obstructed flue space

NFPA 13, Standard for the Installation of Sprinkler Systems — storage provisions

Flue spaces permit vertical heat transfer to ceiling sprinklers and downward water penetration into the rack. Required dimensions depend on the flue type, the storage arrangement, the commodity class, and the sprinkler design basis, and vary by NFPA 13 edition. Applicable dimensional requirements and the edition applied are recorded with the individual finding.

General regulatory references

OSHA 29 CFR 1910.176(b) — Materials stored in tiers shall be stacked, blocked, interlocked, and limited in height so that they are stable and secure against sliding or collapse.

OSHA 29 CFR 1910.159(c)(10) — Minimum 18-inch clearance below sprinkler deflectors.

OSHA General Duty Clause, Section 5(a)(1), OSH Act of 1970 — Employers shall furnish a workplace free from recognized hazards likely to cause death or serious physical harm. This provision is the mechanism by which recognized industry consensus standards such as ANSI/RMI MH16.1 become relevant to federal enforcement where a hazard exists.

Scope of this appendix

The citations above identify the published requirements to which the observed conditions relate. They are provided to support the findings recorded in this report and do not constitute an engineering evaluation, a determination of remaining capacity, or a certification of fitness for continued service.

Where this report recommends that a component be evaluated by a storage rack design professional, that evaluation is a separate engagement and is not included in the scope of this inspection.

End of Report