

UON Key Risk Area: KRA 3.9

Pallet and Steel Storage Racking

1. Purpose

To provide guidance for the safe installation, maintenance and use of pallet and steel storage racking to prevent incidents and injuries.

2. Scope

This document applies to all faculties, divisions, and organisational units of the University of Newcastle and its controlled entities that install, maintain and use static steel storage racking. It does not include drive-in and drive-through racking, cantilever racking, mobile racking or racking made of materials other than steel.

3. Definitions

In the context of this document, the following definitions apply:

- **Leader/Supervisor:** Any member of the University who is responsible for supervising staff and/or undergraduate or postgraduate students and/or for leading research projects who is responsible for the installation, maintenance and use of steel storage racking.
- **Pallet racking:** Pallet racking is a material handling storage aid system, designed specifically to store materials on pallets and accessed by mechanical handling equipment.

4. Responsibilities

4.1 Leaders/Supervisors

Leaders/Supervisors are responsible for ensuring that:

- University staff and students under their supervision are aware of, and comply with, the requirements relating to installation maintenance and use of steel storage racking;

- A risk assessment is undertaken for the lifecycle of steel storage racking utilising the University Risk Assessment Template
- Ensure procedures for safe operation and use are in place and developed, including reporting of damage or unsafe situations.
- Ensure that an annual inspection of the racking is undertaken by a competent person and that safe load bearing signage is maintained.
- Ensure that inspection of the racking is included in regular site safety inspections conducted by staff.

4.2 Staff / Workers

- Provide input to the risk assessment and safe operating procedures when required;
- Comply with the requirements of the risk assessment and procedures relating to pallet and steel storage racking as directed by the Leaders/Supervisor or their delegate, and any Health and Safety related processes;
- Report any damage or defects identified to a leader/supervisor.

5. Procedure

5.1 Design

Steel Racking systems shall be properly designed, fabricated, maintained and used in accordance with the current version of AS4084- Steel Storage Racking. The structural adequacy of the design shall be checked by an appropriately qualified engineer.

Storage racking shall be designed specifically for the size, weight and shape of the products being stored. The design of the racking shall be compatible with the pallets and the materials handling equipment used.

The width of aisles shall be sufficient to accommodate the loading and unloading movements of forklift trucks and other material handling equipment.

For designs where pedestrians can access the back of the racking, and single rows have been installed, rear protection should be fitted to prevent loads falling out of the back of the racking.

5.2 Installation

Leaders should obtain and retain “as built” rack drawings and associated specifications and certificates when racking is purchased and permissible safe stacking loads and the conditions of use of the system shall be clearly marked on each rack.

The following information shall be displayed. See figure 1:

- Racking manufacturer's name, supplier's name and trademark, and the installation date;
- Designer's name;
- Working unit load limit;
- Safe working unit load for each shelf beam level;
- Safe working total unit load for each bay; and
- Maximum distance from the base plate level to the first beam level and maximum distance between adjacent beam levels.

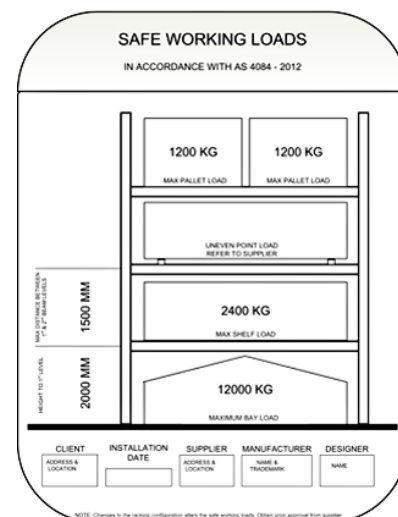


Figure 1 Typical racking Safe Working Load sign

Prior to installation and use a risk assessment shall be conducted using the [University Risk Assessment Form](#).

5.2.1 Modifications

Modifications from 'as built' manufacturers drawings are not permitted without sign-off from the manufacturer, supplier or other competent person e.g. structural engineer.

5.2.2 Collision protection

To prevent damage to pallet racking, the lower parts of the frames that are exposed to potential collision or impact by forklifts or other moving equipment shall be protected, for example by upright protector and end-of-rack protectors. Protection devices shall comply with the requirements of AS4084- Steel Storage Racking.

A traffic and pedestrian plan should be developed.

5.3 Use

All operators who add or remove materials from pallet and steel storage racking shall be trained in the correct practices, including reporting of damage, prohibitions on unauthorised alterations and understand the limits imposed by Safe Working Loads.

Any damage to racking, however minor, must be reported so that it can be immediately assessed. Failure to report damage will be considered a serious safety breach. Refer to Section 5.4 Damage.

Site / area specific work procedures should be developed at each location where storage racking is in place.

5.4 Damage Reports

Workers should report any damage to a supervisor immediately for inspection and assessment. Racking shall be assessed immediately upon damage and a decision made regarding:

- The need to unload the racking and the safety of doing so;
- Barricading the vicinity where product may fall;
- Applying 'Do Not Use' or 'out of service' labels and tape.

The damage should be recorded in the UON incident reporting system and identified where safe to do so, on the racking. Refer to Attachment 1, Damage Action Flowchart (as per AS4804) to guide the recording of damage (for example coloured stick-on tags used to show the location and level of damage).

5.5 Inspections

Three types of inspections shall be carried out on a regular basis. These shall be determined upon the frequency of use and previous history. These include:

1. Inspection undertaken by the forklift driver as they load and unload racking.
2. General inspection of the condition of the racking, loads and area as part of a workplace inspection. These shall be documented and may be included into the regular site Workplace Inspection program. See Attachment 2 for minimum guidance.
3. Inspections by persons competent in the requirements of AS4084- Steel Storage Racking. These shall occur on a regular basis (typically annually) and as required (if damage reported). These shall be documented and include recommended actions.

5.6 Used Storage Racking Systems

Where used storage racking is purchased by the University of Newcastle, the integrity of the racking system should be inspected by a qualified structural engineer, prior to the purchase of the racking. If used racking is sold by the University of Newcastle, the purchaser must be advised in writing that the integrity of the racking system should be inspected by a qualified structural engineer prior to re-assembly.

6. Attachments

1. Damage Action Flowchart
2. Steel Storage and Pallet Racking Inspection minimum requirements

7. References

[HSP 4.1 H&S Risk management procedures](#)

HSG 5.3 H&S Training Guideline

UON KRA 2.1 Manual Handling and Ergonomics

HSG 7.1 Incident notification & investigation

HSG 10.1 H&S inspections and testing

UON KRA 1.4 Plant and Equipment

Attachment 1: Damage Action Flowchart

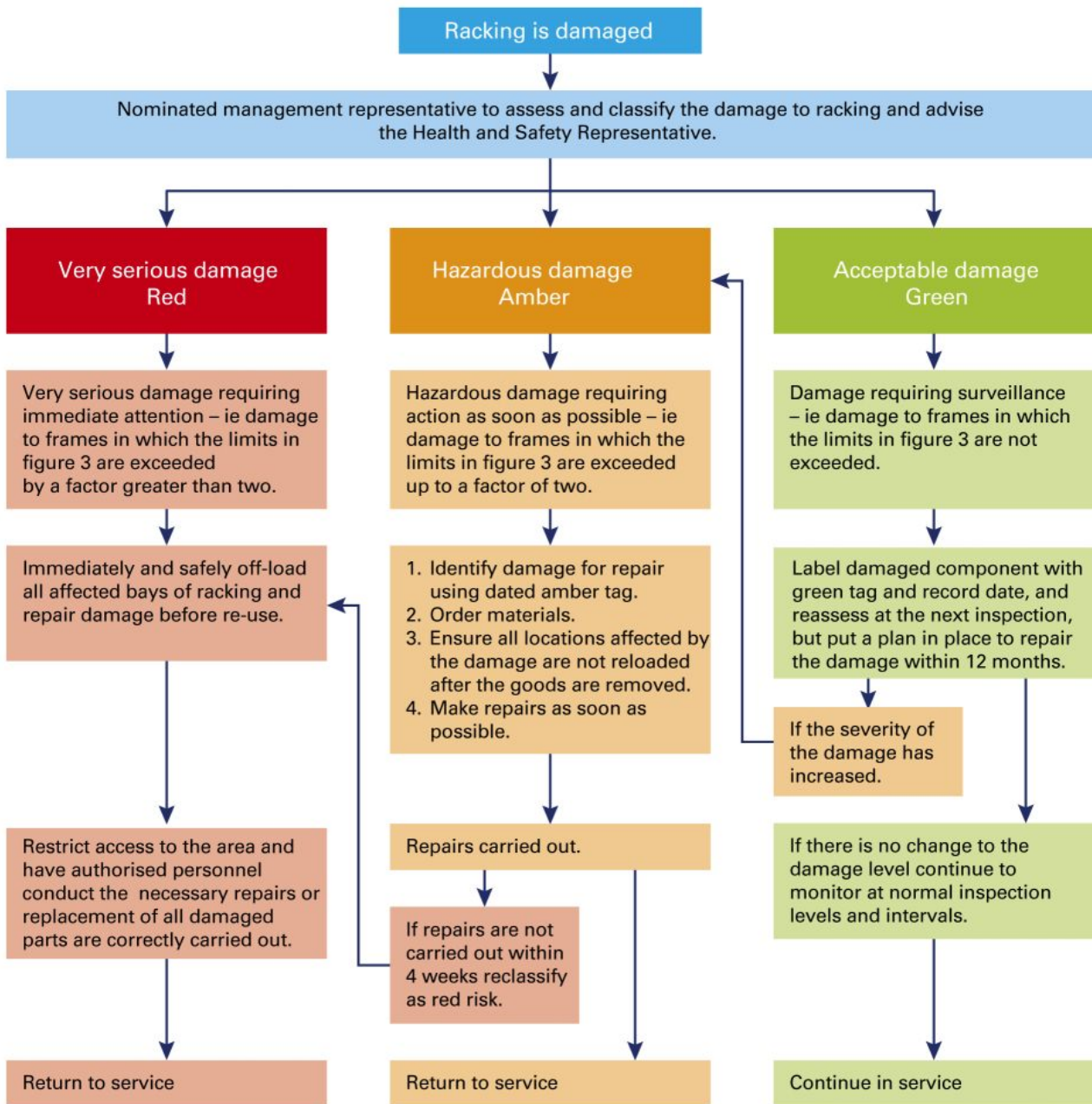


Figure taken from SafeWork NSW – Pallet racking fact sheet (Catalogue No. WC01277)

Attachment 2 - UON Inspection - Pallet and Steel Storage Racking

UON Inspection - Pallet and Steel Storage Racking



| Campus: | | Racking Location: | |
|--|---|---------------------------------|----------|
| Date: | | Inspection completed by: | |
| <p>Note: The following checklist has been developed from guidance provided in SafeWork NSW – Pallet Racking Guide. Please refer to Guidance (over page) when completing the inspection for information about inspection items below.</p> | | | |
| Inspection Item | | Yes / No | Comments |
| <i>Racking and Pallets - Overview</i> | | | |
| 1.1 | Is there any damage to racking? | | |
| 1.2 | Are loads clear of lights and sprinklers? | | |
| 1.3 | Are Safe Working Load signs present on each rack? | | |
| 1.4 | Are the collision protective devices damaged? | | |
| 1.5 | Are goods stored on racking stable? | | |
| 1.6 | Are goods on pallets not overhanging the pallet? | | |
| 1.7 | Are goods stored on upper levels effectively prevented from falling by wrapping, strapping or other means, such as barriers? | | |
| <i>Beams</i> | | | |
| 2.1 | Are beams overloaded? | | |
| 2.2 | Are beams or welds damaged? | | |
| 2.3 | Are beam connectors or safety clips missing? | | |
| 2.4 | Has a beam popped out of its upright? | | |
| 2.5 | Are the anchor bolts that secure the racking to the ground loose? | | |
| 2.6 | Rated Capacity: <ul style="list-style-type: none"> - Are the rack load signs legible? - Can the markings / signs displaying the rated capacities be seen by workers? - Racking configurations have not been altered? | | |
| <i>Uprights and footplates</i> | | | |
| 3.1 | Are uprights damaged? | | |
| 3.2 | Are splices in good condition? | | |
| <i>Out of Plumb</i> | | | |
| 4.1 | Is racking vertical? | | |
| <i>Braces</i> | | | |
| 5.1 | Are racking braces damaged? | | |
| <i>Floor Fixings</i> | | | |
| 6.1 | Are floor fixings installed? | | |
| Comments: | | | |
| | | | |

| Guidance for completing Inspection | |
|---|--|
| <i>Information from Safe Work NSW Pallet Racking Fact Sheet (WC01277)</i> | |
| <i>Inspection Item number:</i> | <i>Guidance information</i> |
| 2.1 | <p>Are beams overloaded? Deflection indicates overloading of the racking. Where two beams connect at an upright, the beam connectors should be parallel. If racking is or has been overloaded, the beam connectors may be deformed (forming a 'V'). The amount of permanent deformation should not exceed the maximum allowed by the manufacturer. In this situation, the racking should be inspected by a competent person.</p> |
| 2.2 | <p>Are beams or welds damaged? Check for obvious signs of beams being hit by a pallet or forklift. Damaged beams should be replaced. If a beam has been hit and is only showing minor damage, ensure welds are checked for cracks by a competent person.</p> |
| 2.3 | <p>Are beam connectors or safety clips missing? Examine beams for damage and replace missing clips. The design of the replacements must be approved by the racking manufacturer. If clips are regularly being dislodged, contact the manufacturer or installer to determine why, and take the necessary action to fix it.</p> |
| 2.4 | <p>Has a beam popped out of its upright? If a beam has popped out this will mean it is only suspended on one end connector and could collapse.</p> |
| 2.5 | <p>Are the anchor bolts that secure the racking to the ground loose? Inspect anchor bolts regularly to ensure they are appropriately tightened. Adjust as required.</p> |
| 3.1 | <p>Are uprights damaged? If an upright shows damaged (See figure below), is twisted or contains splits or cracks, replace it or splice in a new section. Splices should be approved by the racking manufacturer. Replace any damaged uprights and footplates.</p> <div data-bbox="726 1102 1077 1527" data-label="Diagram"> </div> <p>Figure: Typical upright sections and method of measurement. Note: To reduce damaged caused by pallets hitting the uprights, footplates and bracing while being lifted by forklifts, some workplaces install racking with beams at knee height in the bottom bay. This can also assist with manual picking activities as it raises the height of the items to be picked. Note: with permissions from standards Australia this diagram has been reproduced from AS 4084: Steel storage racking for Safe Work NSW.</p> |
| 3.2 | <p>Are splices in good condition? Check the condition of all splices. They should be above the first beam level, not below 1.5m, and no more than one splice should be between any two adjacent beam levels</p> |
| 4.1 | <p>Is the racking vertical? Out of plumb racking is usually caused by incorrect installation but can also be the result of impact, overloading, or settling of the floor slab. Contact the manufacturer or installer.</p> |
| 5.1 | <p>Are racking braces damaged? Replace bent, horizontal or diagonal braces. For bracing, the member deviation from a 1m long straight edge in either plane should not exceed 10mm.</p> |
| 6.1 | <p>Are floor fixings installed? Check floor fixings are installed and undamaged. If damaged, replace it and the footplate. At least two anchors are required in each footplate.</p> |