



Racking Procedure

Brief description

This Procedure sets out the requirements for the safe design, installation, operation and maintenance of storage and pallet racking at Gladstone Ports Corporation (GPC).

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If you require any further information, please contact the Custodian.

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1 Terms and definitions

In this Procedure:

“**Competent person**” means a person who has acquired, through training, qualifications, experience or a combination of these, the knowledge and skills enabling the person to perform the specified task.

“**Racking**” means a structure composed of two or more upright frames, beams and connectors for the purpose of supporting materials in storage.

“**Unit Load**” means an individual stored item.

“**Working Limit (WLL)**” means the maximum working load for storage. Also known as MRC (Manufacturers Rated Capacity or Maximum Rated Capacity).

2 Introduction

2.1 Purpose

This Procedure sets out the requirements for the safe design, installation, operation and maintenance of storage and pallet Racking at GPC.

2.2 Scope

This Procedure applies to adjustable static pallet Racking made of cold-formed or hot-rolled steel structural members utilised on GPC owned and operated sites. It covers Racking installed within a building, outside a building and Racking that forms part of the frame of a building. This Procedure includes site fabricated or purpose built steel Racking.

This Procedure does not apply to drive-in and drive-through Racking, cantilever Racking, mobile Racking or Racking made of materials other than steel. It also does not apply to plastic lockers and other storage cabinets/shelving which are used to store light weight items (less than 25kg per item and less than 200kg in total per storage unit).

2.3 Objectives

The objectives of this Procedure are to:

- (a) Clearly document the requirements for the safe use and maintenance of Racking to ensure consistent application across GPC;
- (b) Ensure GPC provides a safe workplace; and
- (c) Ensure compliance with applicable Australian Standards and other legislative requirements.

3 Racking procedure

3.1 Racking design and layout

Racking should be designed specifically for the size, shape and weight of the items being stored. It should also be compatible with any pallets, storage bins and material handling equipment utilised (e.g. forklift).

All racking should be installed and maintained in accordance with the manufacturers' instructions and *AS 4084:2012 Steel storage racking*. All Racking designs are to be approved

by a Registered Professional Engineer in Queensland (**RPEQ**) in accordance with state legislation, even if the Racking is from an overseas supplier or manufacturer.

The layout of the Racking should consider any material handling equipment (e.g. forklift) to be used to ensure sufficient work zone space for picking and replenishing. The layout should also consider emergency access, adequate lighting and any manual handling activities.

Collision protection should be installed where there is a risk of moving equipment colliding with pallet racking. Bottom portions of frames exposed to possible collisions by forklifts or other moving equipment should be fitted with upright protectors and end of rack protectors to help prevent impact damage. Protection devices must comply with the requirements of *AS 4084:2012 Steel storage racking*. In areas with frequent and high volume mobile equipment, vehicle and pedestrian interaction around Racking, the Traffic Management Procedure should be followed.

Where pedestrian access exists to the rear of Racking (e.g. single bay Racking), protection must be installed to the rear of the Racking system to prevent falling loads.

3.2 Racking foundations

All Racking shall be adequately secured with galvanised hold down bolts to a level concrete slab that has been engineer designed and certified to take the design loading. Where this cannot be achieved, consult with Engineering to determine if the foundation is suitable. The foundation shall be adequate to support fully loaded Racking in extreme events such as cyclonic wind loading conditions (external racking) and earthquake events.

3.3 Working load limits

All Racking will have a maximum load limit for storage as determined by the manufacturer which must not be exceeded. This is referred to as the working load limit (**WLL**).

The following information should be provided by the Racking supplier/manufacturer:

- (a) Racking manufacturer's name, supplier's name and trademark and installation date;
- (b) Designer's name (company or individual) including RPEQ number;
- (c) Working Unit Load limit (total weight capacity per pallet space);
- (d) Total capacity of load for uneven or oversized pallets;
- (e) Total working Unit Load limit for each beam level;
- (f) Total working Unit Load limit for each bay; and
- (g) Maximum distance from the base plate level to the first beam level and maximum distance between adjacent beam levels.

This information must be available to all persons using the Racking and must be clearly displayed on permanent and corrosion resistant signage secured to the Racking in a visible location.

Figure 1 depicts a typical working load sign with the appropriate information and WLLs in accordance with AS 4804:2012 Steel storage racking.

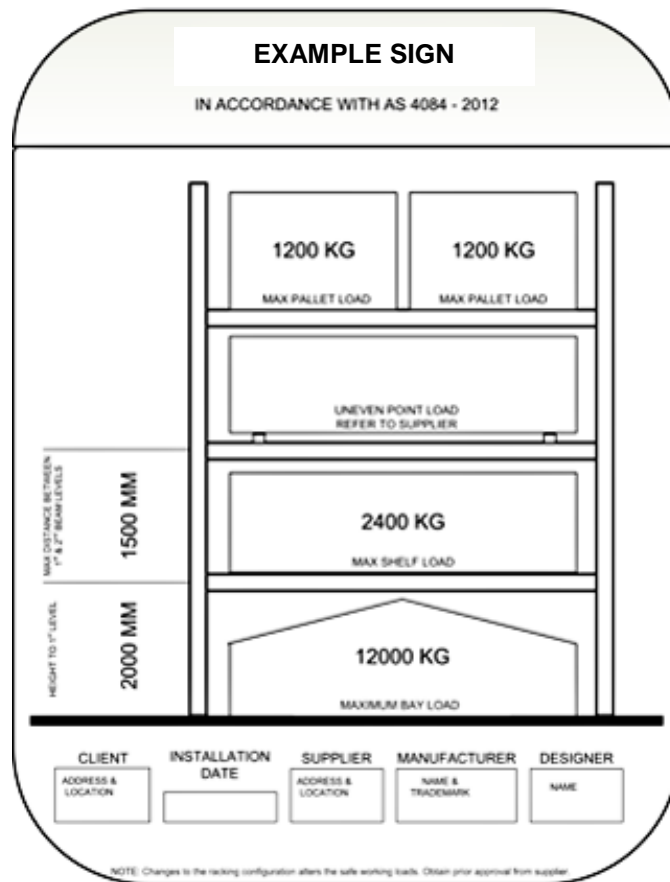


Figure 1: Typical working load sign

For pre-existing Racking in use across GPC with no WLL information or signage, the relevant supervisor must seek assistance from a Competent Person (e.g. engineer) to inspect the integrity of the Racking, establish safe parameters for load capacity and have the appropriate signage developed and secured to the racking.

3.4 Safe operation of Racking

Supervisors of work areas containing storage and pallet Racking are responsible for developing safe work procedures / instructions for Racking procured and utilised in their areas to ensure workers are provided the necessary information to safely use the Racking.

At a minimum, these procedures / instructions should include:

- (a) Correct use and application of handling equipment and Racking;
- (b) Permitted goods for storage;
- (c) Correct securing of loads on the Racking;
- (d) Rated capacities;
- (e) Safe pedestrian, vehicle and/or mobile equipment management;
- (f) Prohibitions on unauthorised alterations; and
- (g) Requirement to report damage as soon as it occurs.

3.5 Pallets and goods on pallets

Pallet Packing must take into account the nature of goods in the Unit Load. An assessment of any change to the pallet design should be performed by a Competent Person (e.g. engineer) to prevent problems. This includes changing from timber pallets to post pallets, using pallets larger than in Racking design, using pallets smaller than allowed for and using skid pallets without timber decks.

When purchasing from an overseas supplier or manufacturer, consideration should be given to the pallet it may be delivered on as overseas pallets often differ in size and may not fit Australian Racking.

General requirements for safe pallet storage on Racking

The following requirements should be met for storing pallets on racking:

- (a) Pallets should only be used if they are of sound quality and appropriate load capacity for the objects being stored.
- (b) Loads on a pallet should be evenly distributed across a pallet. Uneven loads reduce overall capacity and the manufacturer's guide should be referred to for calculating likely capacity changes.
- (c) Wherever possible, objects should be secured to pallets with strapping, tie downs or other appropriate fixings.
- (d) Forklift operators should be trained to avoid 'impact loading' and how to position loads for even distribution of load weight.
- (e) Post or column protectors should be used to protect uprights of racking from damage.
- (f) If an object is larger than a single pallet, where possible any overhang should occur equally at the sides of the pallet, not the front or back. The centre of gravity should be kept close to the middle of the pallet. If there is any concerns, then an engineer is to be consulted.
- (g) Pallets should be placed in racking bays to best utilise storage space without overloading the beams or bays.
- (h) A minimum clearance should be allowed between the top of an object and the underside of a beam, at least 10cm, to allow the pallet to be easily taken on or off the racking.

3.6 Modifications to racking design or components

Any modifications to Racking should take into account the effect on load limits and must be approved by the manufacturer, supplier or qualified engineer (RPEQ). Approved modifications must only be performed by a Competent Person. Operating procedures, signs and drawings must be updated to include details of any modifications.

Physical alterations to uprights, bracings, beams or components (e.g. welding on cleats or bearers) must never be made without the approval of a Competent Person.

Replacement of uprights, bracings, beams, clips or other components should be done using parts from the manufacturer. Where alternative parts are required, an engineering report must be obtained to confirm that the parts are compatible with the Racking and re-confirm the safe working load limits.

3.7 Inspections

Racking should be regularly inspected for damage, storage compliance, visibility of safe working load signage and general conditions of the work area. An inspection schedule and register (Racking Asset Register) is to be maintained by the GPC Asset / Area Owner.

Daily / in use inspections

Before storing an item in Racking or loading/unloading a pallet from pallet Racking, the involved persons should verify the WLL and conduct a general visual inspection of the involved Racking and components for any damage and overloading.

Quarterly inspections

Quarterly inspections shall be performed on Racking to verify the general condition of the Racking, loads and work area. It is the responsibility of the GPC Asset / Area Owner to schedule and perform quarterly inspections. These inspections shall be documented utilising the Pallet and Storage Racking Inspection form template. Any faults or deficiencies identified during inspections are to be followed up for correction by raising a work order or hazard notification.

Annual inspections

An annual inspection shall be performed by a Competent Person / certified vendor on all storage Racking to assess compliance with AS 4084:2012 *Steel storage racking* and check integrity. This inspection shall be documented and include recommended actions as required.

Storing inspection records

Completed inspection records / reports are to be saved in e-Docs and linked in the Racking Asset Register.

3.8 Reporting and managing unsafe conditions or damage

Any unsafe conditions, hazards or incidents related to the operation or maintenance of Racking should be reported immediately to the relevant area supervisor.

Where damage through impact occurs to Racking, the following should occur immediately:

- (a) Cease operation;
- (b) Isolate the area; and
- (c) Report damage to relevant area supervisor immediately.

The relevant supervisor will be responsible for reporting the hazard or incident in SAI360 and engaging a Competent Person (e.g. engineer) to inspect and assess the damage/unsafe condition where the damage may impair the structural integrity of the Racking.

Where the level of damage does not exceed the permissible limits specified in *AS 4084:2012 Steel storage racking*, the Racking can be considered functional and can be monitored through inspections.

Where the level of damage does exceed the permissible limits specified in *AS 4084:2012 Steel storage racking* or involves highly localized damage such as dents, buckles, tears and splits, a Competent Person (e.g. engineer) must inspect and assess the damage in accordance with *AS 4084:2012 Steel storage racking*, determine the effect on safety and the identify appropriate action to be taken.

Where Racking is to be isolated from further use until remedial work is performed, barricading is to be used in accordance with the GPC Barricade Procedure.

Only a Competent Person (e.g. engineer) with an engineering certificate (RPEQ approved) can verify when damaged Racking can be returned to service.

3.9 Selection and purchasing criteria for Racking

Persons responsible for procuring Racking should first consider the purpose and storage requirements for the Racking. Key considerations include:

- (a) Environment where the Racking is to be installed, including layout and accessibility;
- (b) Materials that will be stored on the Racking, including size, contents and weight, and
- (c) Lifting/moving equipment that will be used to access the stored items.

Consideration should also be given of any load limits which might apply to the floor of the storage area.

Racking should be procured from suppliers/manufacturers who can provide Racking configuration drawings, specifications and WLLs with each installation as well as user manuals and appropriate information regarding correct usage and maintenance for training the end user. The supplier/manufacturer must be able to verify that the Racking system complies with *AS 4084:2012 Steel storage racking* or an equivalent Australian Standard.

Approval to procure Racking from a supplier/manufacturer that does not come with the required drawings and specifications must be sought prior to purchasing. The person responsible for procuring the Racking must seek advice and approval from a Competent Person (e.g. engineer). On receipt of the Racking, an engineer must assess the Racking to check the integrity of the system and determine the WLLs. Based on the information provided from the engineer, appropriate signage (see section 3.3 and Figure 1) must be developed, procured and secured to the Racking.

3.10 Naming convention for Racking

All Racking at GPC will utilise a standardised naming convention:

- (a) R – 'R' will prefix the Racking name to signify 'racking'.
- (b) Location code – a one to two letter location code will be utilised next to signify where the Racking is located (e.g. Warehouse = 'W', Building Trades Workshop = 'BT', Mobile Equipment Workshop = 'ME').
- (c) Storage Type – 'P' will follow the location lettering code to signify 'pallet' or 'B' will follow the location lettering code to signify 'bin'.
- (d) 01 – 100 etc. – the Racking will then be given an asset number for the location it is in.

EXAMPLE: RWP01 (racking, Warehouse, pallet, asset 1).

This naming convention will be utilised in the Racking Asset Register and on Racking inspection checklists / reports.

3.11 Records of Racking design

Persons responsible for procuring storage or pallet Racking should obtain detailed drawings showing the layout of the Racking, capacity per pallet space and overall bay load as well as associated specifications and certificates from the supplier/manufacturer for all new Racking

purchases and installations. If there are any changes to the Racking design, drawings should be updated by a Competent Person (e.g. engineer).

GPC Asset / Area Owners with storage and pallet Racking are responsible for maintaining the Racking Asset Register in e-Docs with links or references to applicable Racking drawings and/or specifications.

4 Roles and responsibilities

To assist GPC Representatives to better understand their responsibilities, key responsibilities and accountabilities are summarised below:

Role	Responsibilities
General Manager	<ul style="list-style-type: none"> • Ensure GPC has adequate resources and systems in place for supplying and maintaining suitable storage and pallet Racking and providing information and training. • Provide adequate resources to ensure the effective monitoring and management of the requirements of this Procedure. • Monitor the application and effectiveness of this Procedure to ensure compliance.
Managers	<ul style="list-style-type: none"> • Ensure the established systems within this Procedure are promoted, understood and complied with. • Conduct inspections to ensure storage and Racking equipment is being installed and maintained effectively and the requirements of this Procedure are being met. • Manage non-conformances with this Procedure.
Superintendents, Specialists or Project Managers	<ul style="list-style-type: none"> • Ensure this Procedure is implemented within their area of control. • Ensure training and information is provided for the safe use of storage and pallet Racking. • Manage non-conformances with this Procedure and conduct appropriate investigations into non-conformances. • Conduct inspections to ensure storage and Racking equipment is being installed and maintained effectively and the requirements of this Procedure are being met.
Supervisors	<ul style="list-style-type: none"> • Conduct inspections to ensure storage and Racking equipment is being installed and maintained effectively and the requirements of this Procedure are being met.

	<ul style="list-style-type: none"> • Ensure storage and pallet Racking that meets requirements of this Procedure is procured and accessible to employees. • Ensure employees are provided information and instructed in the correct use of storage and pallet Racking and application of this Procedure. • Develop safe work procedures/instructions in regards to the safe use of Racking systems within their area of control. • Maintain a register of storage and pallet Racking along with applicable manufacturer drawings and specifications. • Manage non-conformances with this Procedure and conduct appropriate investigations into non-conformances.
Engineers or other Competent Persons	<ul style="list-style-type: none"> • Provide relevant advice in relation to the safe design and integrity of storage and pallet Racking, rated capacities and working load limits. • Conduct inspections to ensure storage and Racking equipment is being installed and maintained effectively and the requirements of this Procedure are being met. • Assess damaged Racking, classify damage and determine remedial actions as required.
Employees and Workers	<ul style="list-style-type: none"> • Conduct visual inspection of Racking prior to storing an item or loading/unloading a pallet. • Report any defective or damaged storage or pallet Racking or any situations/conditions which pose a hazard. • Comply with this Procedure.

5 Appendices

5.1 Appendix 1 – Related documents

(a) Legislation and regulation

Key relevant legislation and regulation, as amended from time to time, includes but is not limited to:

Type	Legislation/regulation
State Acts	<i>Work Health and Safety Act 2011 (Qld)</i>
	<i>Work Health and Safety Regulation 2011 (Qld)</i>


Type	Legislation/regulation
Other	AS 4084:2012 Steel storage racking AS/NZS 1170.0:2002 Structural design actions – General Principles AS/NZS 1170.1:2002 Structural design actions – Permanent, imposed and other actions AS/NZS 1170.2:2011 Structural design actions – Wind actions AS/NZS 1170.4:2007 Structural design actions – Earthquake actions in Australia AS 3600:2018 Concrete Structures AS 4100:1998 Steel Structures

(b) Gladstone Ports Corporation documents

The following documents relate to this Procedure:

Type	Document number and title
Tier 1: Policy	#365624 Safety Policy
Tier 2: Standard/Strategy	#854303 Safety Management Standard
Tier 3: Specification/ Procedure/Plan	#123526 Barricades Procedure #1516431 Traffic Management Procedure
Tier 4: Instruction/Form/ Template/Checklist	#1585954 Pallet and Storage Racking Inspection Checklist Template #1621179 GPC Corporate Glossary Instruction
Other	#1604011 – Racking Asset Register


5.2 Appendix 2 – Inspection Checklist Template



PALLET AND STORAGE RACKING INSPECTION CHECKLIST

INSPECTION LOCATION:																			
INSPECTION DATE:							INSPECTION COMPLETED BY:												
INSPECTED RACKING	IDENTIFIED DEFICIENCIES																		
Storage / Pallet Racking (include identifying location / description information for each storage / pallet racking system in area being inspected)	Frame post / column damage	Frame corrosion / rust	Racking braces missing / damaged / modified	All baseplates anchored	Beam deflection / deforming / damaged or unsecured	Beam connectors / safety clips missing	Floor fixing missing / damaged	Anchor bolts missing / damaged / loose	Load capacity sign missing / not visible	Load capacity in breach	Collision protection devices missing / damaged	Unstable storage on racking	Pallet overhangs	Pallet correct for use and free from damage	Stored item clearance sufficient	Upper level storage at risk of falling	Housekeeping inadequate	Concrete foundation damaged or cracked	FAULT REFERENCE (A, B, C... IN COMMENTS)
KEY: ✓ = Deficiency identified X or – or N/A = Deficiency not identified																			

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PALLET AND STORAGE RACKING INSPECTION CHECKLIST

COMMENTS / DETAILS OF FAULTS		
Ref	Fault Details	SAI360 Hazard / JDE Work Order Reference
A		
B		
C		
D		
E		
F		
G		
H		

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5.3 Appendix 3 – Revision history

Revision date	Revision description	Author	Endorsed by	Approved by
07/09/2020	Original document creation. Incorporates HSF legal review (legal review resulted in no material change to original consulted document).	Kirsty Iszlaub, Acting Safety Specialist – Systems & Projects	Rowen Winsor, People Community & Sustainability General Manager	Tony Young, Safety & Training Manager