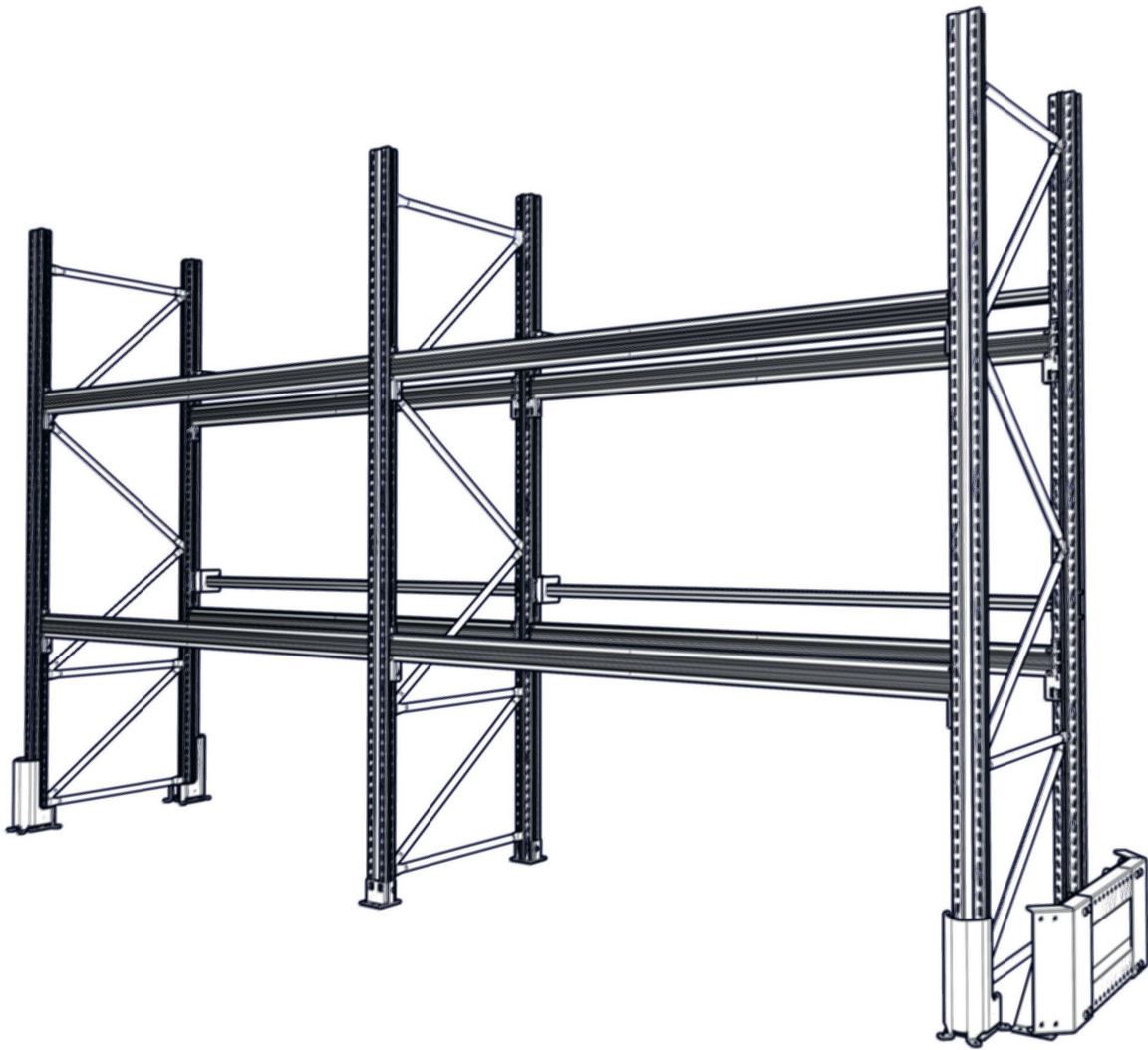


Pallet Racks

Instructions for Installation and Use



WELAND

Prior to installation

Details about the building and the environment where the storage system will be used.

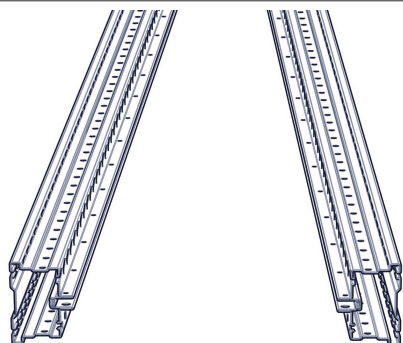
- Including the characteristics of the floor that will be used as the base for the storage equipment and the mechanical handling equipment.

Details about the goods that will be stored in the equipment as well as specification of pallets or other types of load carrier.

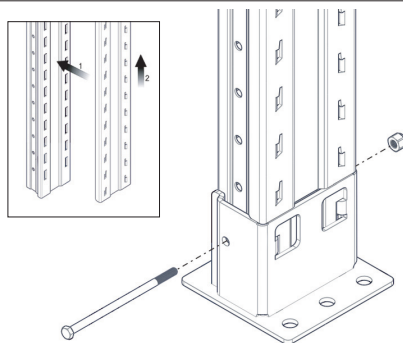
- Specification of the loads permitted in the storage equipment. Layout and design of equipment to enable the provision of sufficient handling space for the safe loading in and out of goods taking into account the intended use.

Specification of the handling equipment that will be used, e.g. type of forklift truck, together with storage equipment.

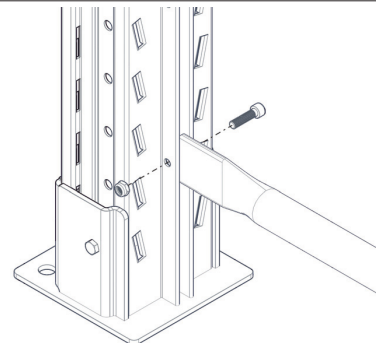
- Specified requirements for collision protection and capacity to withstand collisions.
- Specification of who will perform the installation of the storage equipment.
- Known information about future changes in storage needs.



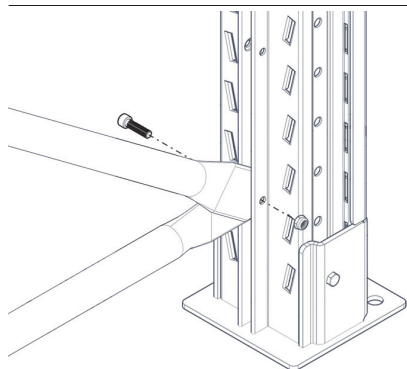
1. Place two posts on the ground, parallel with each other. Check that the holes for attaching the post foot are at the same end on both of the posts.



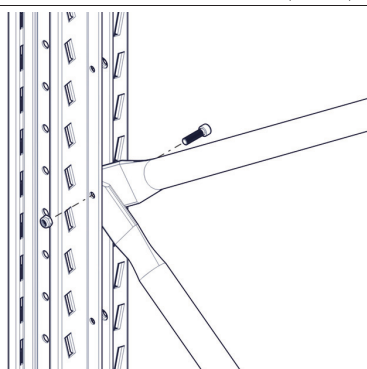
2. Assemble the post foot on the post and fasten it in place using 1 M8 x 130 and locking nut. Assembly of any reinforcement plate is installed from underneath before the foot is put in place.



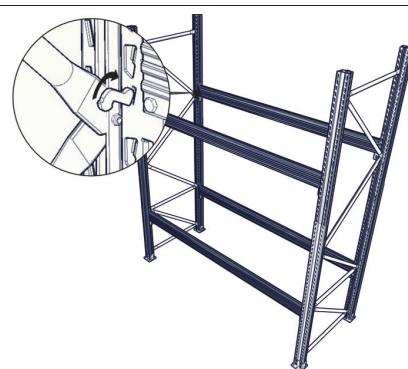
3. The first horizontal strut is fastened in the 1st hole counting from the top (135 mm) of one of the posts. 1 M6 x 24 and locking nut.



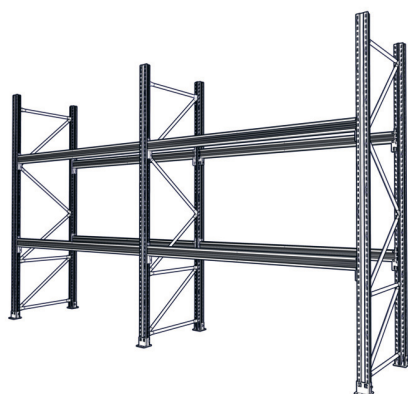
4. After this, the same horizontal strut, together with the first diagonal strut must be secured in the 2nd hole down on the opposite post. 1 M6 x 24 and locking nut.



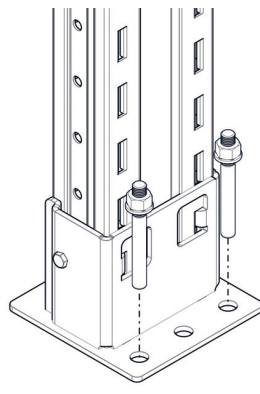
5. Then, set out the other diagonal and horizontal struts as shown in the bracing diagram on the next page or enclosed drawing. Use the number of M6 x 24 and locking nuts required.



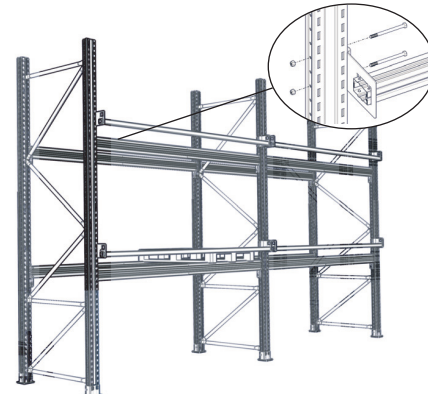
6. After this, erect a section consisting of 2 end panels. Assemble the support beams from the inside, and push the lock plate firmly into place. (2 per support beam)



7. After this, continue assembling the end panels and support beams according to the previous points.

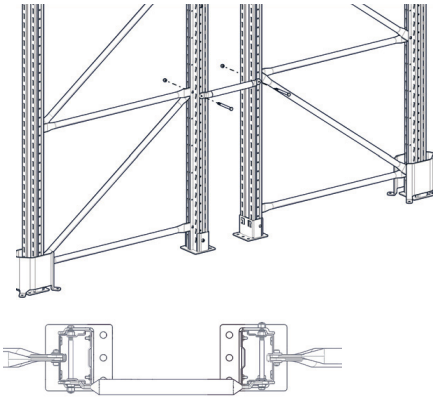


8. All footplates must be anchored using 2 M10x 90 expander bolts per footplate. In the case of installation on surfaces other than concrete, please contact WLS.



9. Install each back stop bracket using 2 M8 x 110. Push in the back beam and lock it on to the hooks in the brackets.

Accessories

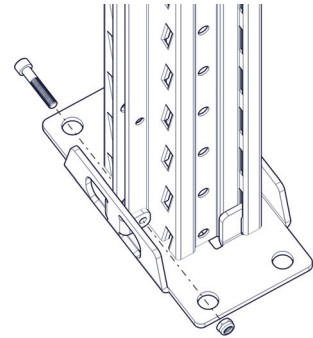


End panel spacers are used to keep the correct distance between the pallet racks and to provide increased stability. Assemble using M8 x 120, washers and locking nuts.

End panel spacer

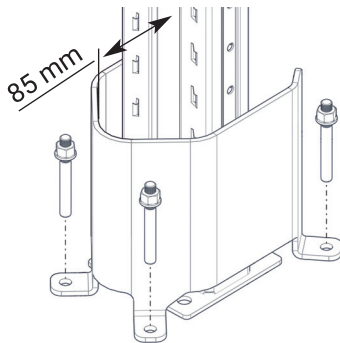
When installing pallet racks back to back, to give a double rack, at least two spacers must be used. The bottom one of these is placed adjoining the next lowest horizontal strut. The upper end panel spacer is placed adjoining the upper diagonal strut bracket. By every fourth diagonal strut bracket, there is an end panel spacer, unless there are two or less diagonal struts to the upper end panel spacer.

Alternative post foot



Assemble the post foot on the post and fasten it in place using 1 M6 x 35 and locking nut. Any reinforcement plate is installed from underneath, before the foot is put in place.

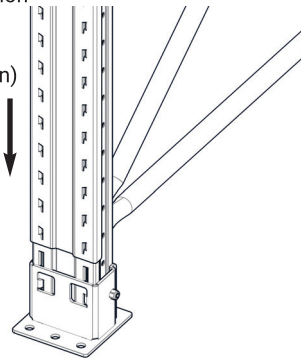
Post protection/Collision protection



Place the post protection above the footplate and secure with 4 M10 x 90 expanders.

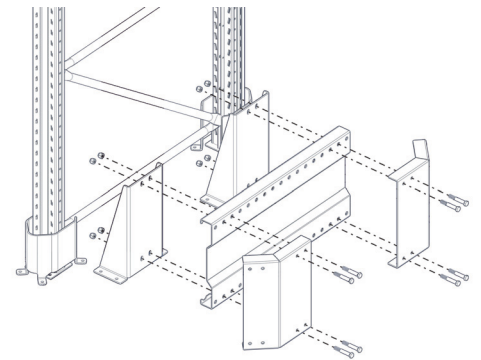
Post protection

The post protection must be forced down (hammered down) properly.



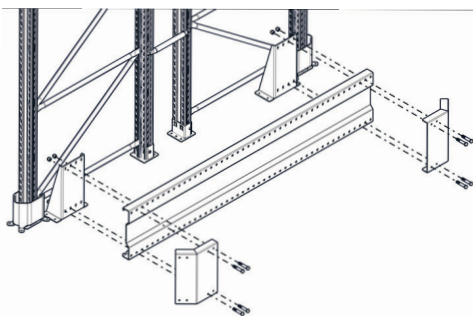
It is easiest to install the post protection on the posts before the footplate (see point 2) but it can be also installed from above later.

Collision protection single end panel



End panel protection. Screw beam and feet together using M12 screw and nut. Then, anchor to the floor using 8 M10 x 90 expanders.

Collision protection double end panel



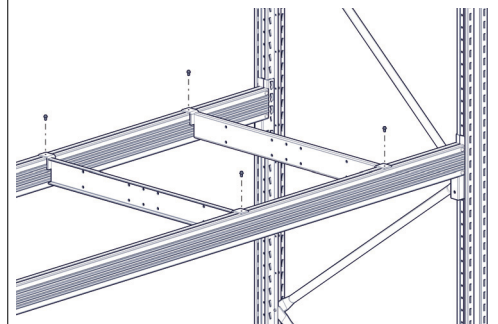
End panel protection double. A middle support has to be fitted using M12 screw and nut. Anchor to the floor using 4 M10 x 90 expanders.

Half-pallet insert



Half-pallet inserts are screwed together using 4 M8 x 55 and locking nut per side.

Long-side insert



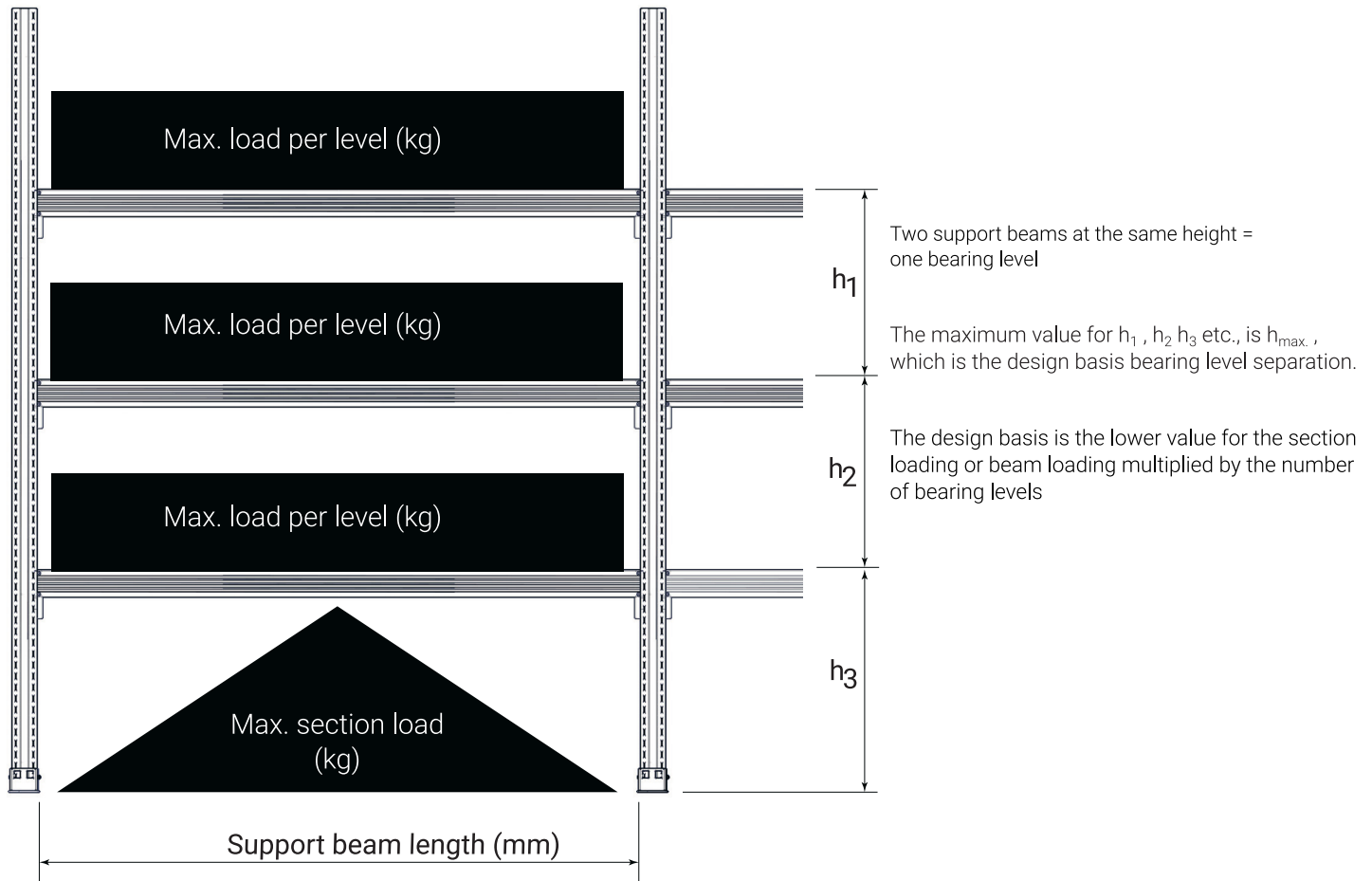
Long-side inserts are attached to the support beams using self-drilling screws.

Load data/loading plates

For new installations, object specific loading diagrams are enclosed, see example below. The pallet rack configuration, such as distance between support beams, type of support beam etc., must not be larger than stated in the object specific or on general loading plates. The general loading data shown in the tables on page 5 is used in case of alterations or other changes to the pallet rack that differ from the original installation, where the client doesn't find it necessary to make use of the higher capacity provided by the object specific loading diagram.

Loading signs must be placed where they are clearly visible. WLS provides fixings for attaching them to the pallet rack's panel ends.

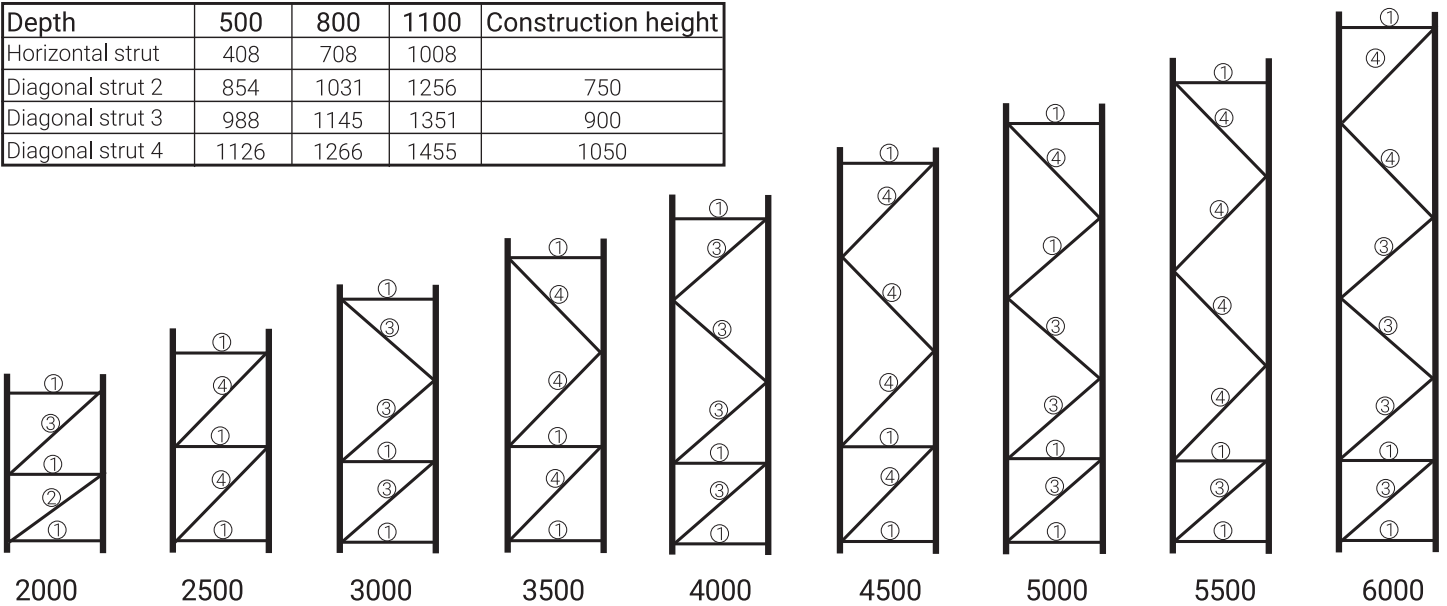
During conversion of the pallet racks, the load capacity can change. In connection with this, the supplier or an expert must be consulted and their recommendations followed. WLS provides object specific loading diagrams if requested by the client in case of conversion or other changes to the pallet racks.



Bracing structure on end panels

Strut length

Depth	500	800	1100	Construction height
Horizontal strut	408	708	1008	
Diagonal strut 2	854	1031	1256	750
Diagonal strut 3	988	1145	1351	900
Diagonal strut 4	1126	1266	1455	1050



Load per section

Post FL
Section load (kg)

Bearing level separation h_{max} (mm)	Support beam type				
	H80	H100	H120	H140	H160
750	8300	8300	8900	8900	8900
1000	8100	8100	8600	8600	8800
1250	7600	7600	8500	8500	8500
1500	6800	6800	8500	8500	8500
1750	6000	6000	7300	7300	8000
2000	5300	5300	6500	6500	7200
2250	4900	4900	6000	6000	6700
2500	4400	4400	5300	5300	5900

NOTE! At least 2 bearing levels and support beam length ≤ 2700 mm are required.

Post FM
Section load (kg)

Bearing level separation h_{max} (mm)	Support beam type				
	H80	H100	H120	H140	H160
750	9400	9400	11300	11300	11300
1000	8700	8700	10800	10800	11000
1250	7400	7400	10600	10600	10600
1500	6200	6200	9000	9000	10600
1750	5800	5800	8300	8300	9800
2000	4900	4900	7100	7100	7800
2250	4500	4500	6500	6500	7000
2500	4300	4300	5600	5600	6400

NOTE! At least 2 bearing levels and support beam length ≤ 2700 mm are required.

Post FH
Section load (kg)

Bearing level separation h_{max} (mm)	Support beam type				
	H80	H100	H120	H140	H160
750	10100	10100	13300	13300	13600
1000	9300	9300	12800	12800	13600
1250	8200	8200	12500	12500	13300
1500	6900	6900	10900	10900	12800
1750	6300	6300	9900	9900	12800
2000	5400	5400	8500	8500	10100
2250	5000	5000	7800	7800	9000
2500	4700	4700	6600	6600	8200

NOTE! At least 2 bearing levels and support beam length ≤ 2700 mm are required.

Post FEH
Section load (kg)

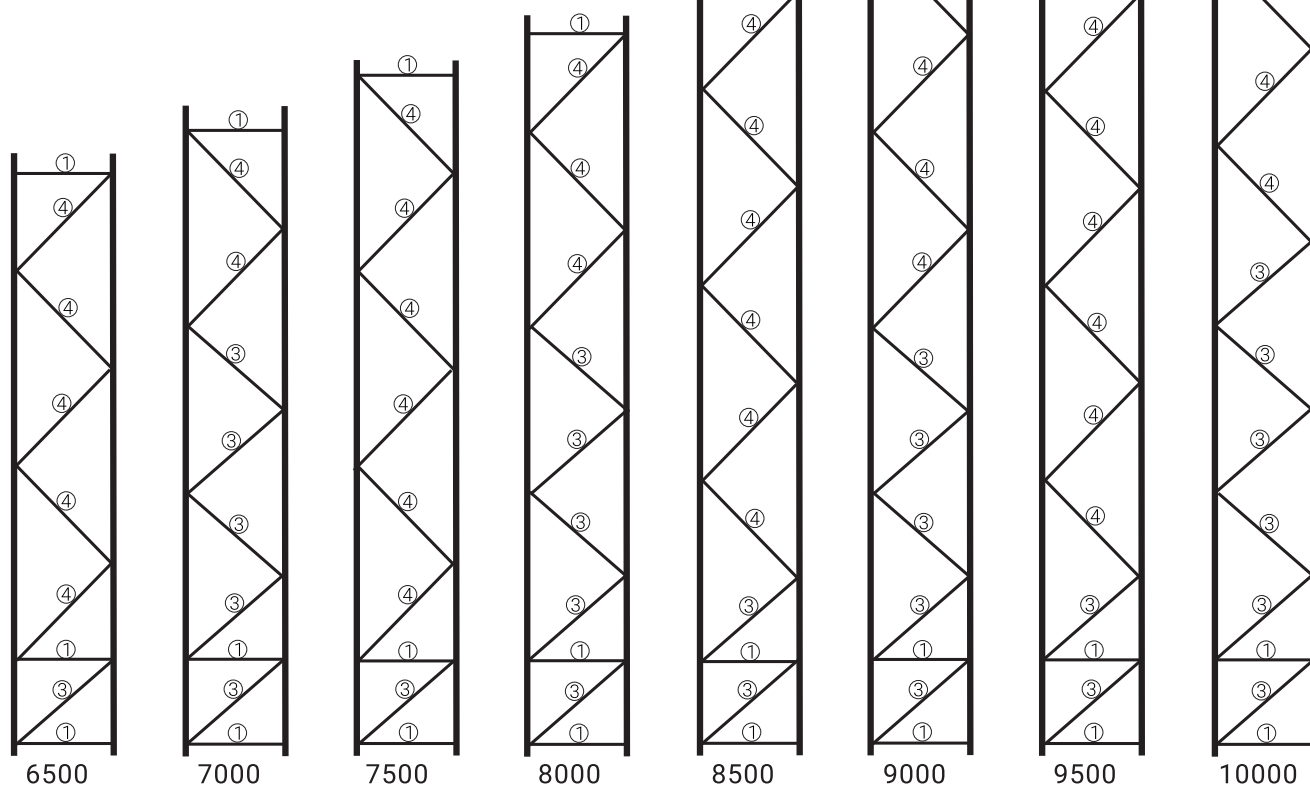
Bearing level separation h_{max} (mm)	Support beam type				
	H80	H100	H120	H140	H160
750	12300	12300	17300	17300	17300
1000	10400	10400	17300	17300	17300
1250	9000	9000	14900	14900	17300
1500	7500	7500	12500	12500	16900
1750	7200	7200	11500	11500	15000
2000	5900	5900	9600	9600	12700
2250	5600	5600	8900	8900	11600
2500	5500	5500	8600	8600	10800

NOTE! At least 2 bearing levels and support beam length ≤ 2700 mm are required.

Load per level

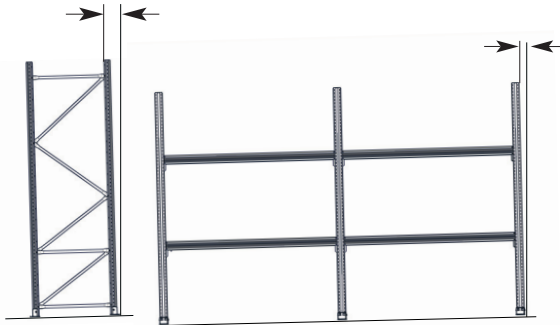
Support beam load (kg)

Bearing level separation (mm)	Support beam type				
	H80	H100	H120	H140	H160
950	3600	4800	6100	7400	8400
1300	2800	3700	4700	5700	6400
1800	2200	2800	3600	4200	4700
2200	1700	2400	3000	3500	3900
2600	1300	2100	2800	3100	3300
2700	1200	2000	2600	3000	3300
3100	900	1500	2000	2600	2900
3600	700	1200	1500	2100	2600



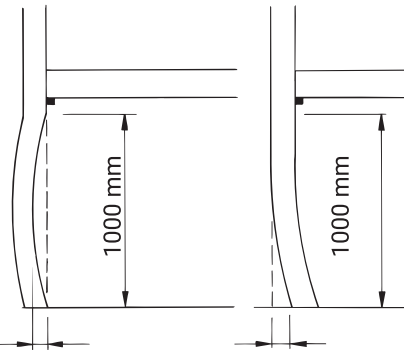
A few important points to check on the pallet rack before it is put into use and thereafter daily inspection. Deviations must be corrected!

Gradient

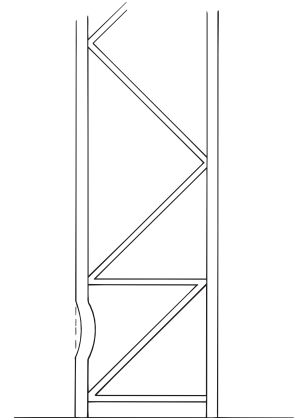


The gradient relative to the vertical is permitted to be max. $H/350$ (2.8 mm/m). For loaded racks $H/350 + H/200$ (7.8 mm/m)

Crooked posts

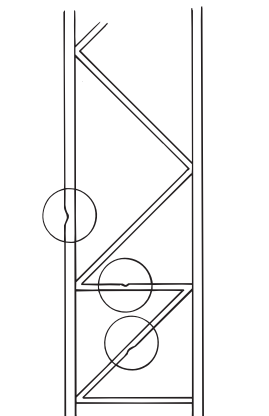
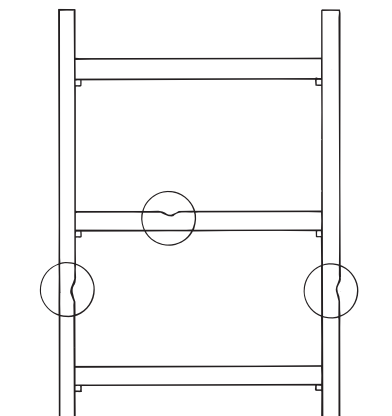


Along the support beams' length, the posts are permitted to deviate from the vertical by a maximum of 5 mm per metre.



Along the pallet rack end panel's depth, the posts are permitted to deviate from the vertical by a maximum of 3 mm per metre.

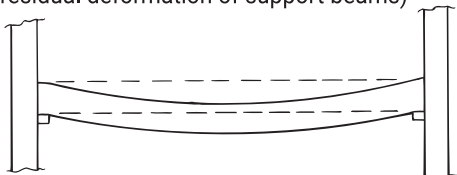
Dents and folds



If dents or folds appear on posts, struts or support beams, they must be replaced.

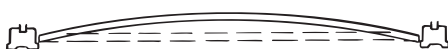
Beams

(residual deformation of support beams)



Sag:

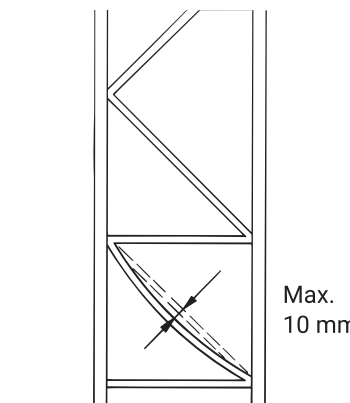
Max. residual sag after unloading from the maximum permitted load: $L/1000$.



Laterally:

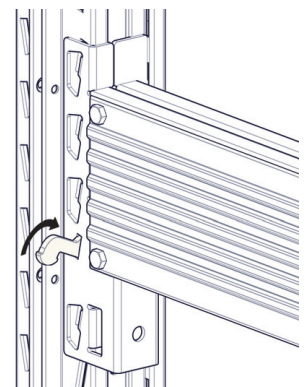
Max. residual bend after unloading from the maximum permitted load: $L/400$.

End panel strut



The struts can be straightened if the deformation is less than 10 mm.

Lock plate



Check that the lock plates are in all support beams and that they are pressed in completely.

Installation

Competence and provision of installation instructions

- The installation must be performed professionally according to Weland Lagersystem's installation instructions in order to guarantee the quality of the installation, because this has a major effect on the pallet rack's strength and function.
- Fitters assigned by Weland Lagersystem have the necessary experience and knowledge for the installation of pallet racks. If other personnel are assigned, they are assumed to have the equivalent competence to perform the installation based on the installation instructions. Should personnel other than those assigned by Weland Lagersystem be used, the installation instructions provided must be followed exactly.

Installation quality and strength

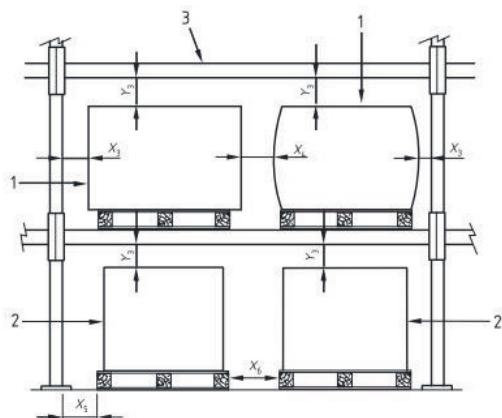
- Installation tolerances affect bearing capacity and mechanical strength and must comply with the requirements indicated for adjustable pallet racks in SS-EN15620, unless otherwise stated by the designer.

Important aspects to consider during installation

- The racks must be fastened to the floor according to the previous Instructions for Installation and Use
- If rear bracing is used, see separate installation instruction, the pallet rack's configuration must not be altered without contacting WLS.
- The pallet rack's feet must be in contact with the floor or base/plinths over their entire area. Where necessary, use permanently placed steel levelling plates. Max. permitted difference in height for points 3 metres apart without levelling, depending on material handling equipment, is 4.0 mm. Instead of levelling plates, the entire surface of the footplate can be cast in sufficiently strong and non-shrink concrete by an expert.
- Users have to appoint an individual to be responsible for the storage equipment's safety and make this person's name known to the warehouse personnel. The person in question must know about goods handling in the warehouse and its risks. This is best done by means of a risk analysis.
- Warehouse personnel have to be trained in the use of storage equipment and handling equipment.

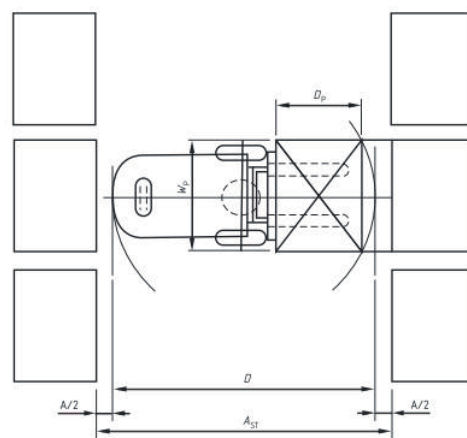
Use

Measurements to take into consideration during installation/use; see SS-EN 15620:2008.



Explanation

- 1 Pallet with load overhang
- 2 Pallet without load overhang
- 3 Beam shown without sag



Explanation

- A free space for manoeuvring
Dp unit load or load pallet's depth
D width for 90° turn for forklift truck and load
Ast minimum free aisle width between the load unit's front or the rack position at all levels
Wp unit load or load pallet's depth

Horizontal and vertical handling space for forklift trucks in one section.

Beam height Yh from floor up to beam level, mm	X3 X4 X5 X6 mm	Y3 mm
3000	75	75
6000	75	100
9000	75	125
13000	100	150

The installation instructions comply with Swedish Standard SS-ISO 15635:2008

The client, or person appointed by the client, is recommended to acquire the above mentioned standard from SIS.www.sis.se

Maintenance

Damage arising from collision, for example, must be repaired immediately, because it will probably affect the pallet rack's bearing capacity.

A damaged post or support arm constitutes a safety risk and must be replaced unconditionally.

Disposal

All components of the pallet rack are recyclable.

Accessories

To increase the safety of the pallet rack further, accessories are available in the form of post protection, collision protection, fall protection etc.

Installation inspection

The installation must be inspected to ensure it has been performed according to the installation instructions before the pallet rack is put into use. To avoid the risk of overloading the pallet rack, it is important that the loading diagram shown on the loading signs be observed.

Conversion

In case of any conversion of the pallet rack, an installation inspection must be performed before it is put into use.

Daily inspection

The pallet rack must be inspected regularly to ensure there isn't any damage to any component that affects the pallet rack's bearing capacity. Damaged components must be replaced.

Periodic inspection

It is legally binding that the pallet rack be inspected at least once a year to ensure that it complies with the installation instructions.

When repairing the pallet rack, damaged bearing components must be replaced. Repair of other equipment is permitted.

The client, or the user of the pallet rack, is responsible for ensuring that inspections are performed and documented.

Marking

Posts and support beams are marked with information about post type/support beam type. From the load table, the load per section and load/bearing level respectively can be read off.

It is the supervisor's responsibility to ensure that these loading tables are available for the personnel concerned and that they are observed.

The logo for WELAND, featuring the word "WELAND" in a bold, italicized, sans-serif font. A thick horizontal line is positioned above the letters "E", "L", and "A", extending from the left edge of the "W" to the right edge of the "A".

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