UNARCO MATERIAL HANDLING, INC.

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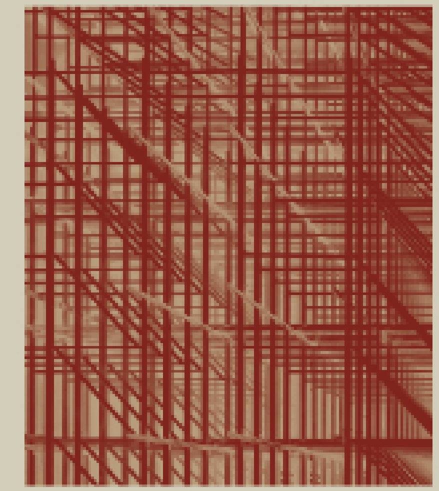
STRUCTURAL RACK SYSTEMS



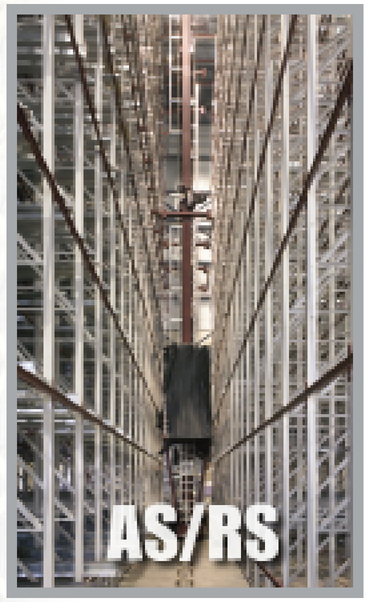
UNARCO MATERIAL HANDLING, INC.

UNARCO was the first pallet rack manufacturer in the industry. With fifty years in production, engineering and design, no one offers more experience in how to increase efficiency in warehouses and distribution centers.

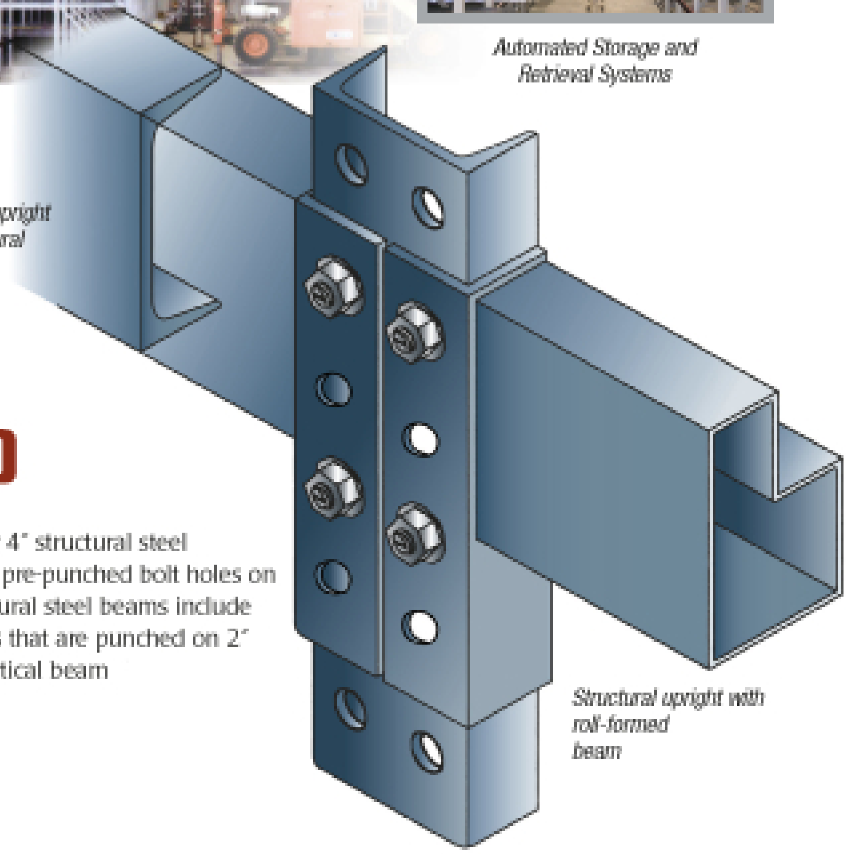
Flexibility that you will not find in other large pallet rack manufacturers stems from the ability to produce an entire line of warehouse storage solutions including carton flow, pallet flow, push back, drive-in/drive-thru and cantilever. But more importantly, UNARCO has structured its customer service and manufacturing facilities to LISTEN to customers' needs and respond with custom designs and smarter solutions.

HIGH-STRENGTH STRUCTURAL STEEL

UNARCO Structural Racks are designed to prevent damage from forklift abuse. The posts are constructed from structural steel and are much thicker than roll-formed posts, particularly at the corners which are the primary impact points.



Automated Storage and Retrieval Systems



STRUCTURAL
BOLTED

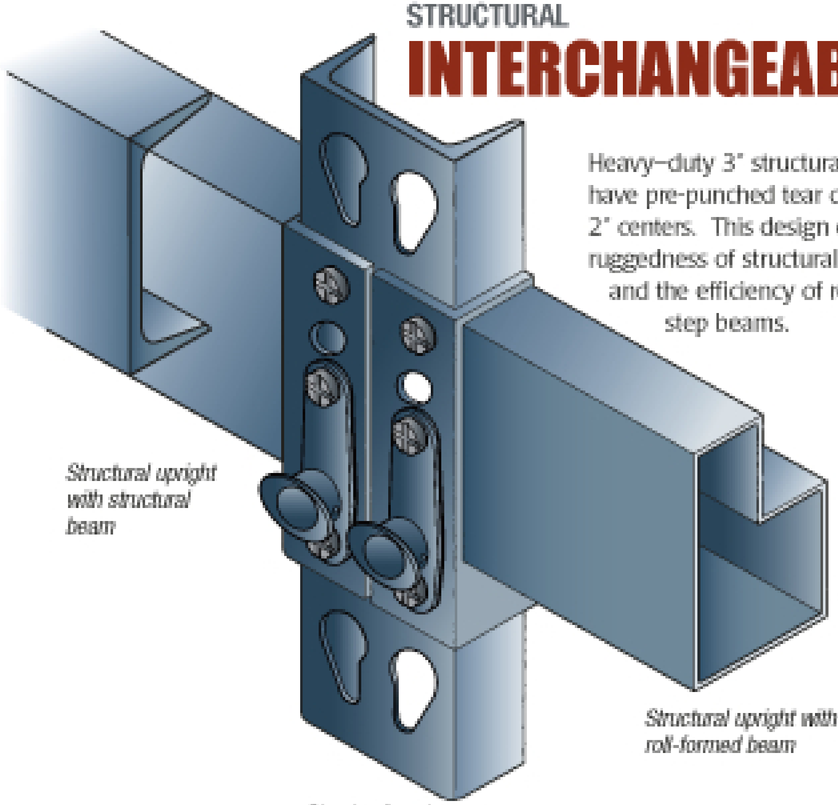
Heavy-duty 3″ or 4″ structural steel C-Channels have pre-punched bolt holes on 4″ centers. Structural steel beams include beam connectors that are punched on 2″ centers for 2″ vertical beam adjustability.

RIGIDITY
EFFICIENT
ECONOMICAL

Unarco Engineering uses the high strength and durability of structural steel for large projects with heavy loads or highly engineered pick modules.

STRUCTURAL
INTERCHANGEABLE

Heavy–duty 3″ structural steel C-Channels have pre-punched tear drop openings on 2″ centers. This design combines the ruggedness of structural steel uprights and the efficiency of roll-formed step beams.



- ***Strength***
- ***Ductility***
- ***Easily Repaired***
- ***Abuse Resistant***
- ***Heavy-Duty Structural Bracing***

ENGINEERING
INSTALLATION
PROJECT MANAGEMENT

UPRIGHT FRAME SELECTION

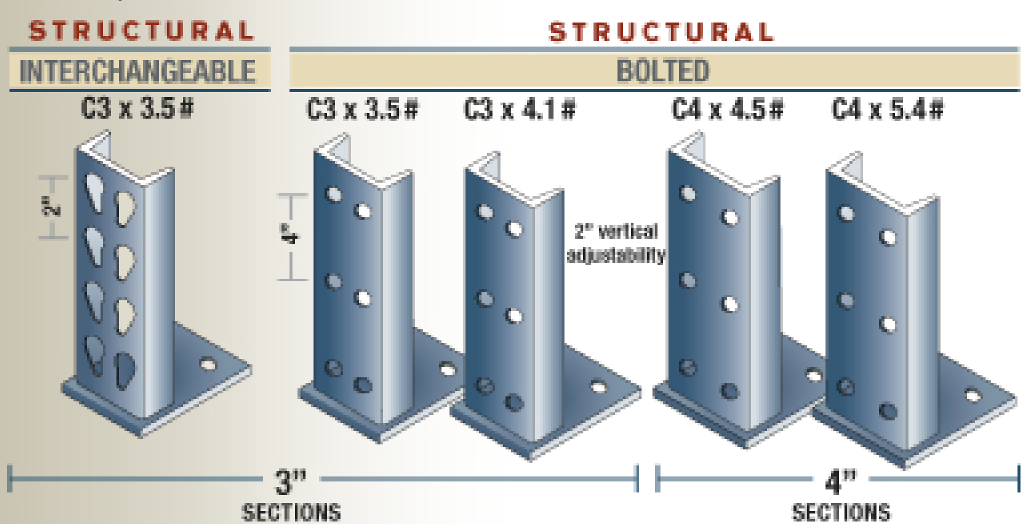
STRUCTURAL CHANNEL FRAME TABLES BOLTED

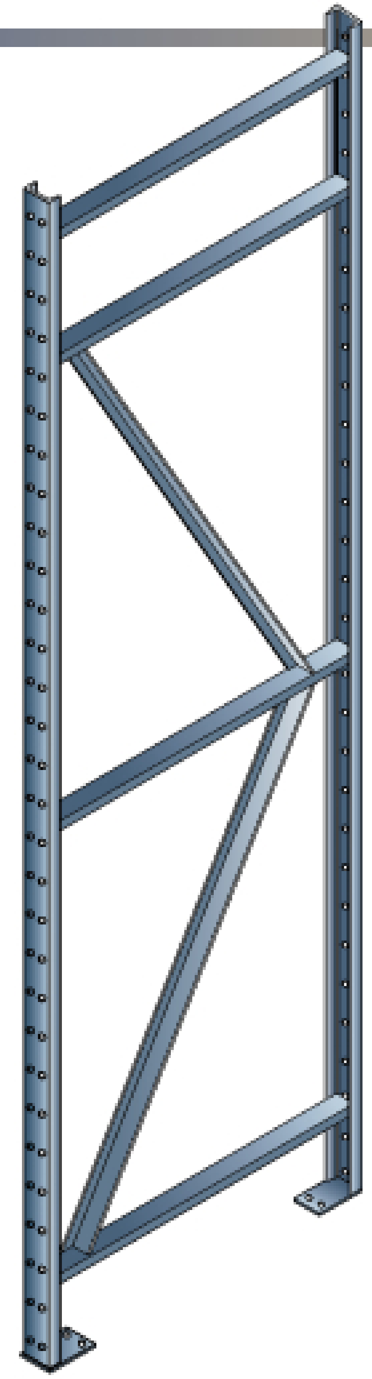
COLUMN SIZE	C3 x 3.5#	C3 x 4.1#	C4 x 4.5#	C4 x 5.4#
Shelf Space	40" Pan.	40" Pan.	40" Pan.	40" Pan.
36"	25,987	28,165	41,719	44,516
42"	25,987	28,165	41,719	44516
48"	25,987	28,165	41,719	44,516
54"	25,987	28,165	41,719	44,516
60"	25,987	28,165	41,719	44,516
66"	25,987	28,165	41,719	44,516
72"	25,803	26,480	41,719	44,516
78"	22,611	23,045	41,719	44,516
84"	19,574	19,865	41,676	43,668
90"	17,051	17,305	38,355	39,884
96"	14,986	15,209	35,098	36,200

* Indicated in pounds.

STRUCTURAL CHANNEL FRAME TABLES TEAR DROP

COLUMN SIZE	C3 x 3.5#
Shelf Space	40" Pan.
36"	25,357
42"	25,357
48"	25,357
54"	25,357
60"	25,357
66"	25,357
72"	25,177
78"	22,063
84"	19,099
90"	16,638
96"	14,623





All values in the above tables assume that each column carries half of the frame load. The table values are expressed in pounds per frame. These values are based on gravity loading only that is purely axial. Any condition where the axial load is accompanied by moment, the axial load capacity will be less. This will occur for non-symmetrical loading conditions. The capacities also assume that the baseplates and the bracing are of adequate strength and that all other parts of the rack have been properly designed. All values are for undamaged racks that are installed plumb. It is the rack user's responsibility to properly maintain the racks to ensure that the carrying capacity of the racks is not reduced by damage and that any changes to the rack configuration do not cause an unsafe condition.

Frame capacities are based on the unsupported length, which is the measurement of the distance between the floor and the top of the first beam or the maximum spacing between beams, whichever governs.

Refer to www.unarcorack.com for latest updates to installation instructions, user manuals and safety notices.

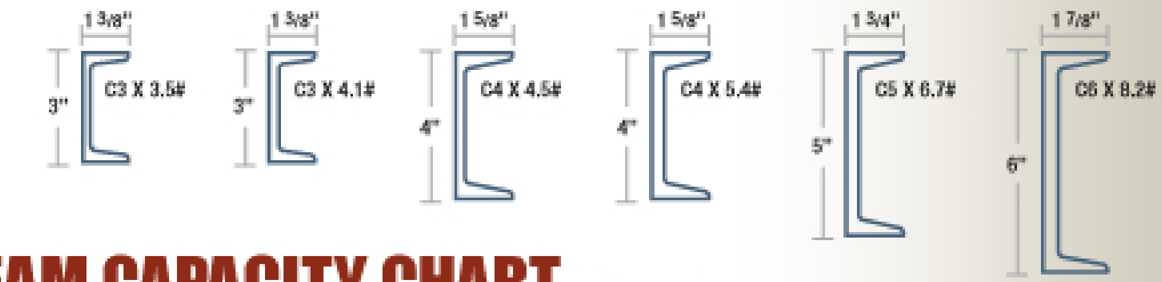
Capacities do not take seismic, wind or other lateral forces into consideration.

Upright frames have to be anchored with at least one anchor bolt in each post and require a minimum concrete floor strength of 3,000 PSI for the maximum loads.

CONTACT THE UNARCO SPRINGFIELD OFFICE FOR ANY OF THE FOLLOWING CONDITIONS:

- Any application where the frame load exceeds 31,000 lbs. These frames may need larger base plates or heavier bracing.
- Any application that requires seismic design where the design ground acceleration Ss exceeds 25%g in IBC areas.
- Configurations that require a frame deeper than 60 inches or higher than 40 feet.
- Applications that involve support platforms or catwalks or any application other than normal pallet rack.
- Any single row where the height-to-depth ratio exceeds 6 to 1. These must be checked for anchorage against overturning.
- Any condition which creates uncertainty as to the proper use of these tables.

Column protection is recommended for uprights subjected to potential column abuse from lift trucks.



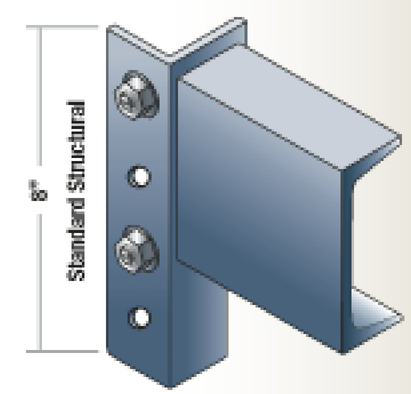
BEAM CAPACITY CHART (indicated in pounds)

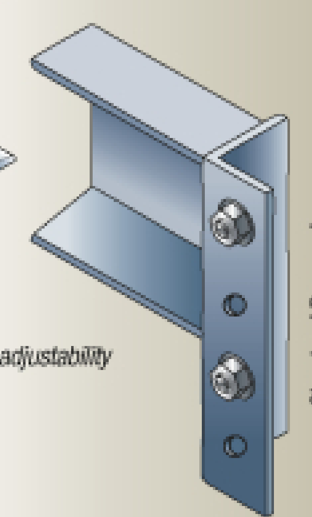
COLUMN SIZE	C3 x 3.5#		C3 x 4.1#		C4 x 4.5#		C4 x 5.4#		C5 x 6.7#		C6 x 8.2#	
	W/O Tie	W/ Tie	W/O Tie	W/ Tie	W/O Tie	W/ Tie	W/O Tie	W/ Tie	W/O Tie	W/ Tie	W/O Tie	W/ Tie
48"	12,593	12,858	13,521	13,632	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000
60"	9,602	10,470	10,364	11,100	15,246	16,000	16,000	16,000	16,000	16,000	16,000	16,000
72"	7,577	8,680	8,231	9,057	11,801	14,074	12,917	15,132	16,000	16,000	16,000	16,000
84"	6,106	6,502	6,683	6,777	9,046	11900	10,263	12,802	15,379	16,000	16,000	16,000
90"	5,402	5,716	5,954	5,954	7,865	11,028	9,005	11,868	13,351	16,000	16,000	16,000
96"	4,777	5,068	5,276	5,276	6,904	10,263	7,908	11,048	11,676	16,000	15,871	16,000
102"	4,258	4,527	4,709	4,709	6,112	9,486	7,003	9,947	10,300	15,580	13,941	16,000
108"	3,821	4,070	4,231	4,231	5,451	8,493	6,246	8,903	9,155	14,577	12,344	16,000
114"		3,680		3,824		7,650		8,015		13,678		16,000
120"		3,345		3,473		6,928		7,255		12,867		16,000
126"		3,054		3,169		6,304		6,598		12,133		16,000
132"		2,800		2,903		5,760		6,026		11,163		16,000
138"		2,577		2,669		5,285		5,525		10,222		15,444
144"		2,379		2,463		4,865		5,084		9,395		14,619
150"		2,203		2,279		4,494		4,692		8,663		13,859
156"		2,046		2,114		4,163		4,344		8,012		13,156

- All capacities are expressed in pounds per pair of beams. Only gravity loading and the RMI required impact have been considered.
- All values are based on a uniformly distributed load (i.e. each beam carries 50% of the load) and assume proper installation and no beam damage.
- The deflection limit for all beams is the length divided by 180.
- Beams that are longer than 108" require lateral ties.
- Values in the table are for the beam bending only.
- Please consult Springfield Engineering for any shelf load over 10,000 lbs.
- Capacities include 12.5% impact for two pallets side by side. For a three-pallet-wide shelf, the values should be multiplied by 0.95.
- For one pallet per shelf, the values should be multiplied by 0.90.
- Capacity chart is based on current RMI specifications.

UNARCO rack designs conform to the latest Rack Manufacturers Institute (RMI) specifications and AISC Cold Formed Steel Design Manual using "Load and Resistance Factor Design" (LRFD) Method.

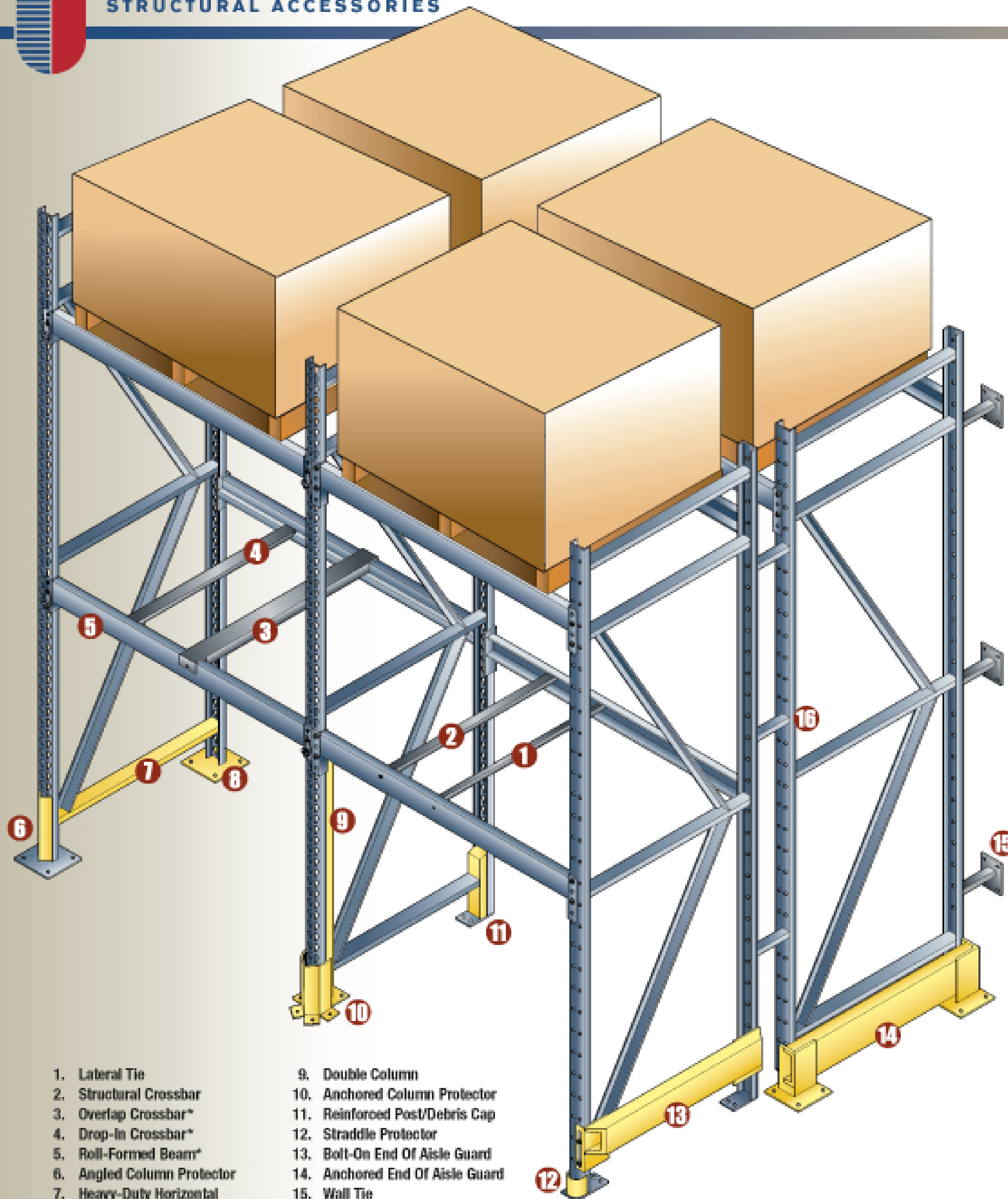
Refer to www.unarcorack.com for latest updates to installation instructions, user manuals and safety notices.





2" vertical adjustability

WWW.UNARCORACK.COM

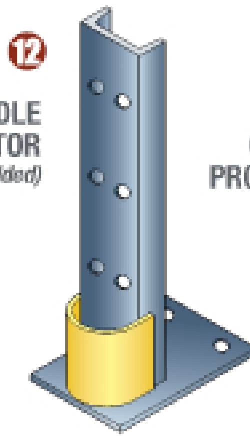


1. Lateral Tie
2. Structural Crossbar
3. Overlap Crossbar*
4. Drop-In Crossbar*
5. Roll-Formed Beam*
6. Angled Column Protector
7. Heavy-Duty Horizontal
8. Seismic Baseplate
9. Double Column
10. Anchored Column Protector
11. Reinforced Post/Debris Cap
12. Straddle Protector
13. Bolt-On End Of Aisle Guard
14. Anchored End Of Aisle Guard
15. Wall Tie
16. Row Spacer

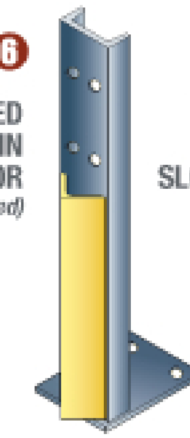
* Accessories for use with structural interchangeable uprights and roll-formed beams.

DURABILITY OPTIONS

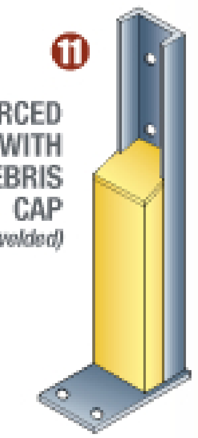
12 STRADDLE PROTECTOR *(welded)*



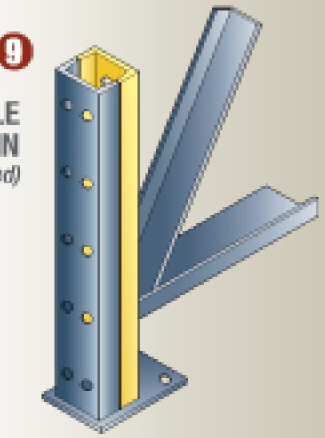
6 ANGLED COLUMN PROTECTOR *(welded)*



11 REINFORCED POST WITH SLOPED DEBRIS CAP *(welded)*

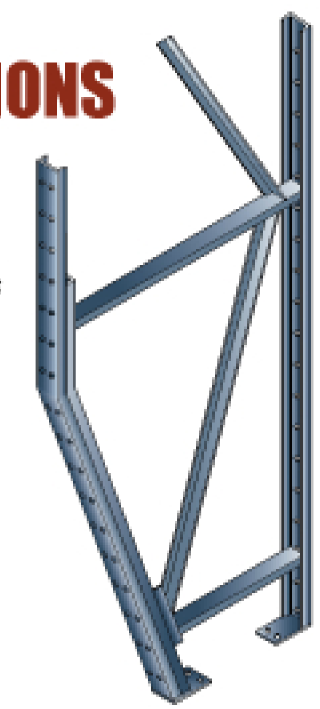


9 DOUBLE COLUMN *(welded)*



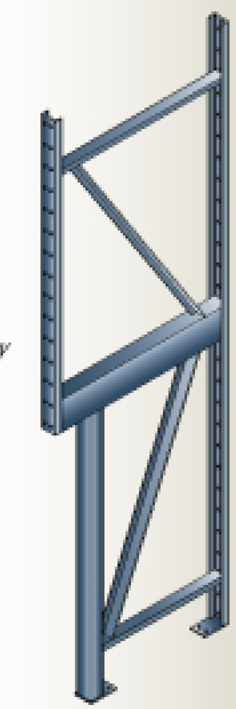
FRAME OPTIONS

- ***Helps reduce the risk of forklift impact to uprights with special designs which set the base out of harm's way***
- ***Improves aisle clearance***



SLOPED LEG

Sloped leg option moves the base away from fork lift traffic

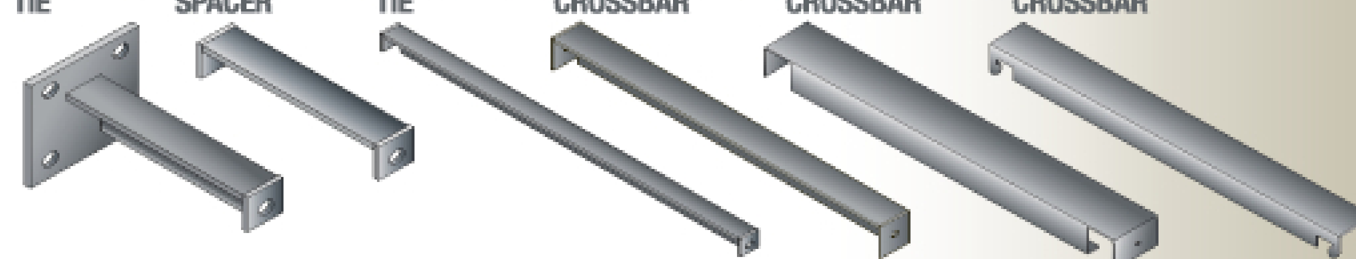


CANT LEG SET BACK FRAME

Front leg is offset to help minimize damage from impact

RACK ACCESSORIES

15 WALL TIE · 16 ROW SPACER · 1 LATERAL TIE · 2 STRUCTURAL CROSSBAR · 3 OVERLAP CROSSBAR · 4 DROP-IN CROSSBAR



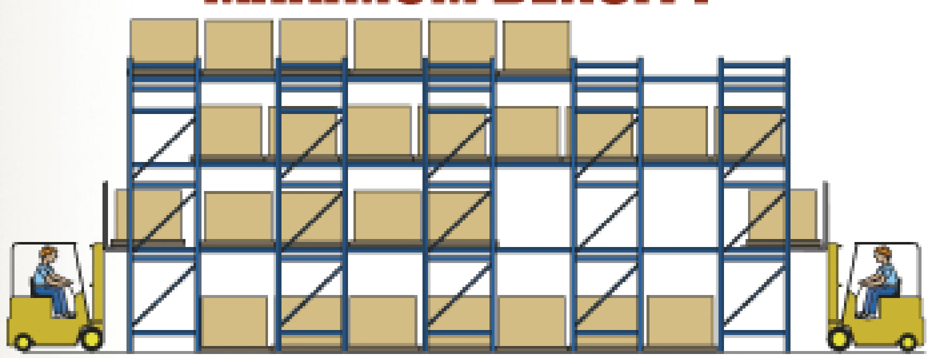
(For roll-formed beams only)

(For roll-formed beams only)

UNARCO Structural Drive-In and Drive-Thru racks provide the highest density storage available. The system depth reduces the need for aisles and increases space utilization.

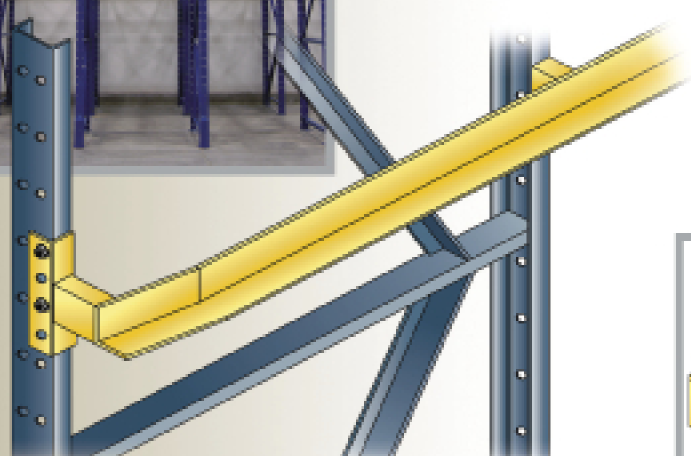
- ***Specifically for uniform pallet loads***
- ***Easy to assemble***
- ***Cost effective***
- ***Sturdy, bolted connections***

MAXIMUM DENSITY



Drive-In: Load and retrieve from the same side (LIFO)
Drive-Thru: Load from one aisle, retrieve from separate aisle (FIFO)

Pallets are placed on rails that run the depth of the rack

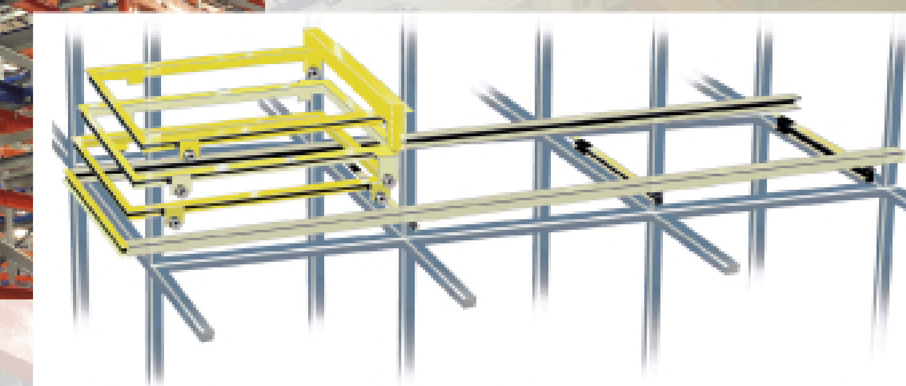


Drive-In Rail with Space Saver Arm for easier placement of pallets

Straight Rail Option

Push Back systems work by putting pallet loads on a series of nesting carts. As a pallet is loaded from the front, it pushes the pallet behind it back one position. When it is time to unload (LIFO), the front pallet is removed and the rear pallets automatically come forward to the front picking position.

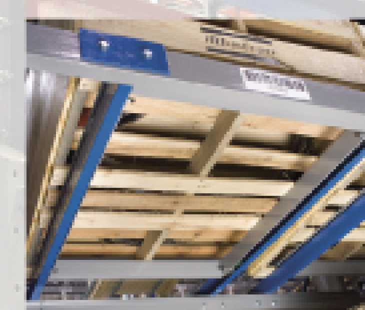
STURDY STRUCTURAL DESIGN



PUSH BACK

2-deep system

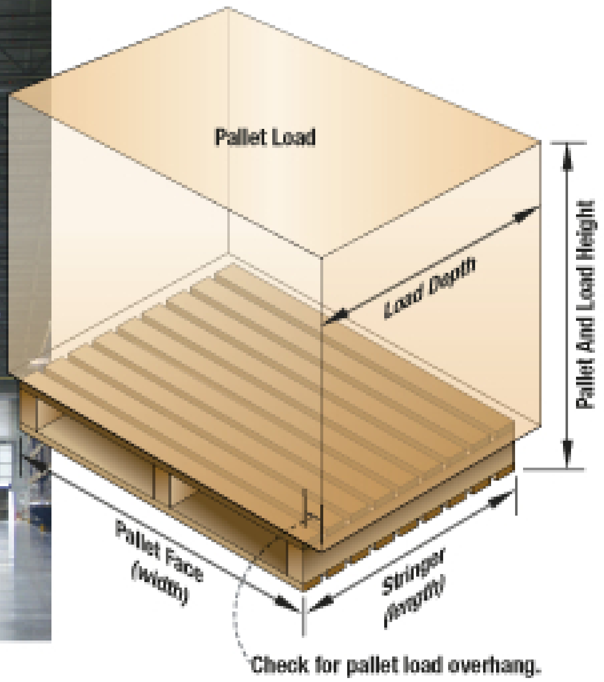
Carts flow automatically on four sealed wheels

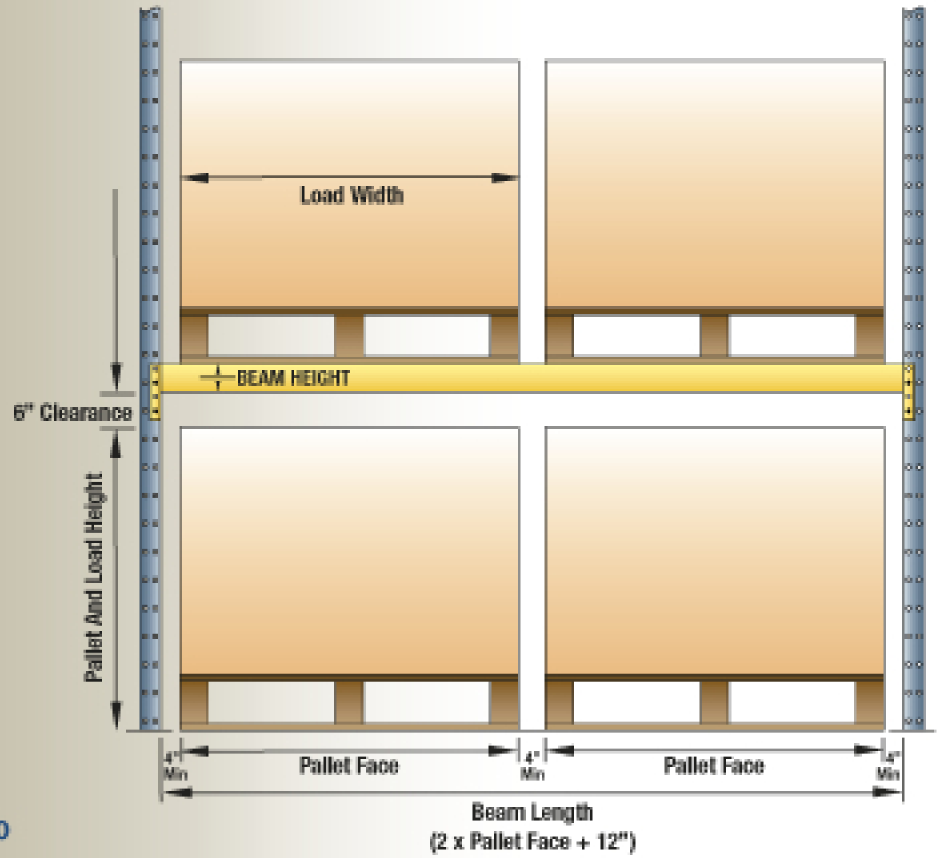


Strong structural sides and rails

- ***Available in 2, 3, 4, 5 and 6 deep configurations***
- ***Lift truck drivers never enter the rack***
- ***Nesting carts require minimal vertical space***
- ***Product loads are always in picking position, thanks to gravity***
- ***No special pallets are required***
- ***Suitable for coolers and freezers with temperatures as low as -30º F***

RECOMMENED DIMENSIONS AND CLEARANCES





TYPICAL BAY OPENINGS

If load overhangs pallet, the load width must be used to calculate clearances and beam length.

RACK REPAIR

Trained technicians can install bolt-on options to fix low-level damage with specially designed repair kits.

- ***In most cases no welding is required***
- ***Installs easily into existing rack of any manufacturer***
- ***Available in structural or tubular roll-formed versions***

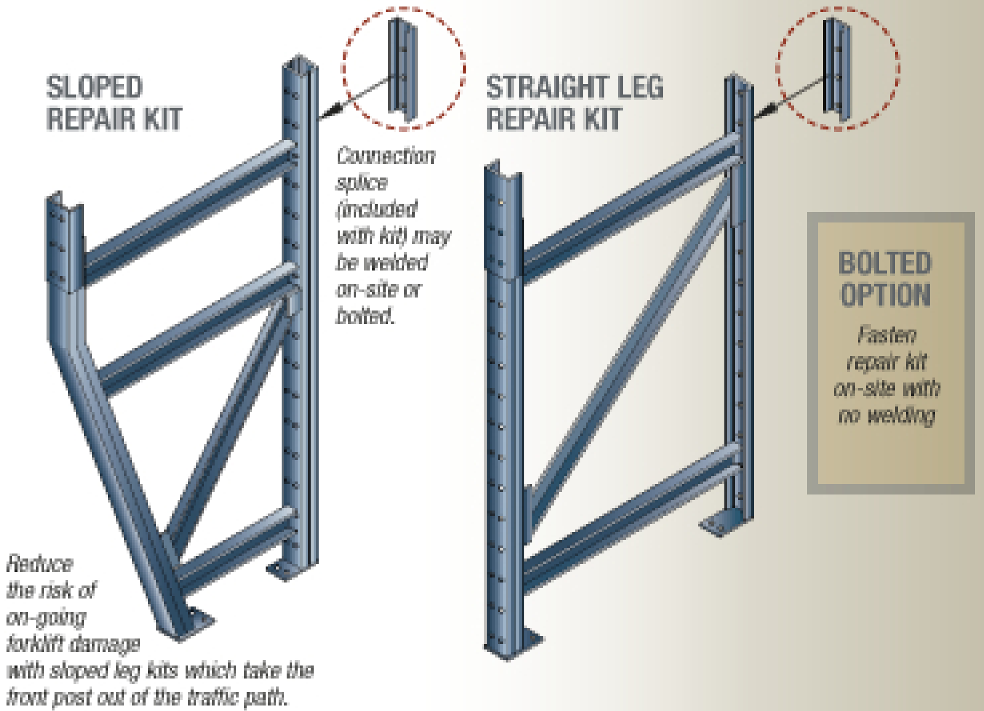

Double-Column Structural Selective Pallet Rack

Before attempting to repair damaged rack and to insure rack capacities are adequate, please consult Springfield Engineering.

Rack repair kits should only be installed by trained personnel.

Let Unarco set up a scheduled inspection and maintenance program to help insure the safety of your warehouse.

Available in welded and bolted options



UNARCO STANDARD COLORS

High-quality powder coated finishes for durability and rust resistance

Contact a UNARCO representative for special finish requests.
Hot-dipped galvanized finish also available.