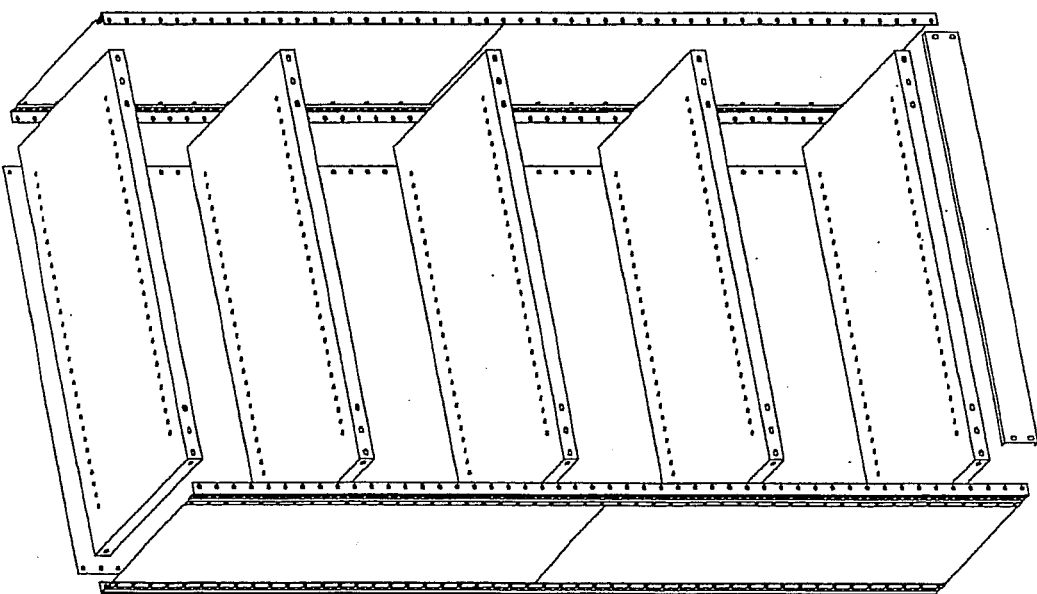


26002



How to Assemble

Read all instructions prior to assembly.

1. Assemble end and interior frames as per OFFSET POST CLOSED FRAMES ASSEMBLY INSTRUCTIONS.

2. Stand two frame assemblies on edge.

3. Attach back panels to inside of offset posts with nuts and bolts at 3rd hole from top of posts, where panels overlap, and 1st hole from bottom of posts. If back-to-back units are desired, leave nuts finger tight.

4. Attach base (if included) to inside of front offset posts with nuts and bolts at lowest position. Make sure base is flush with bottom of posts when tightening. Note: Front clips on bottom shelf are not used with offset post bases. Front of shelf will rest on base or be nut and bolted into place.

5. Stand this assembly in a vertical position. Insert shelf clips at desired height locations.

6. Install top and bottom shelves and press down on each shelf to seat properly.

7. Repeat Step 6 for remaining shelves.

To add additional units:

8. Attach back panels to inside of rear of standing interior frame in same manor as Step 3.

9. Stand an interior frame in a vertical position and attach to back panels in same manor as Step 3.

10. Repeat Step 4 and procede with step 6.

To end a row of units:

11. Use end frame assembly instead of interior frame assembly and procede with Step 8.

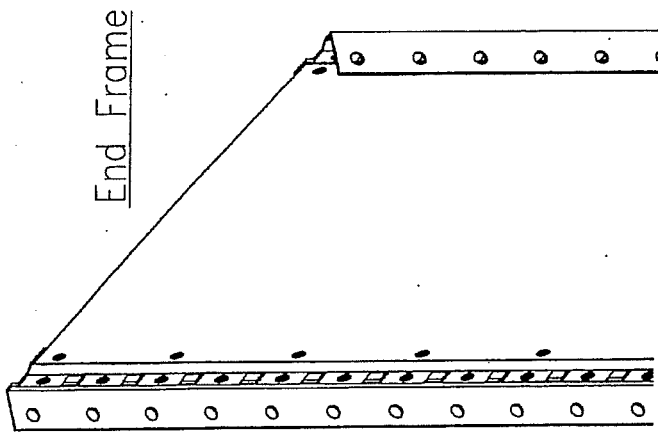
If a back-to-back row is desired:

12. Attach frames directly to rear of frames on assembled units. Back panels will be shared. The bolts attaching the back panels to the assembled units need to be removed in order to attach frame to frame. Be sure to leave one side of back panel attached to one frame at all times.

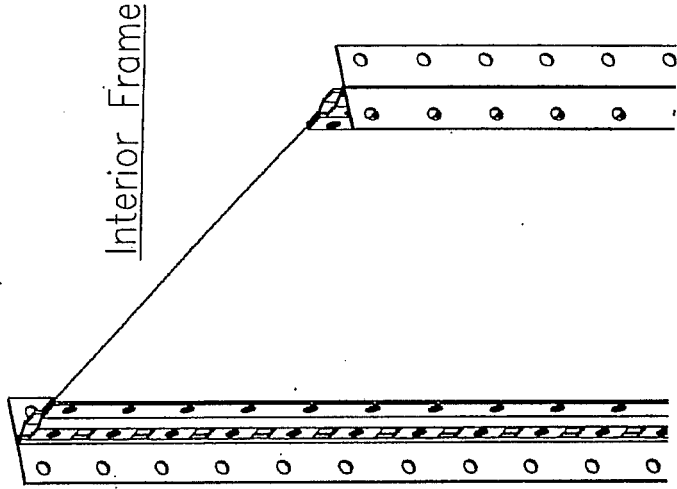
13. Repeat Step 4 and procede with Step 6.

Note: For units 10' high and taller, panels should also be bolted every 18".

Closed Offset Post Clip Type Assembly Instructions



End Frame



Interior Frame

How to Assemble End Frame

Read all instructions prior to assembly.

1. Attach side panels to inside of offset post with nuts and bolts at 1st hole from bottom, the 3rd hole from top, and where panels overlap.
2. Repeat Step 1 for other side.

Note: Heads of bolts should be on outside of frame.

For units 10' high and taller, panels should also be bolted every 18".

How to Assemble Interior Frame

Read all instructions prior to assembly.

1. Attach side panels between two offset posts with nuts and bolts at 1st hole from bottom, the 3rd hole from top, and where panels overlap.
2. Repeat Step 1 for other side.

For units 10' high and taller, panels should also be bolted every 18".

Offset Post Closed Frames Assembly Instructions

SHELVING BRACING CONSIDERATIONS

FOREWORD AND INTRODUCTION

The Shelving Manufacturers Association, hereinafter referred to as SMA, is a product section of The Material Handling Institute, Inc. and is comprised of manufacturers engaged in the design, fabrication, sale and installation of industrial grade steel shelving. The Engineering Committee of the SMA has developed a "Specification for the Design, Testing, Utilization and Application of Industrial Grade Steel Shelving," which subsequently was adopted by The American National Standards Institute (designated as MH 28.1, 1982).

The intent of this document is to provide guidelines relative to the purpose, function and proper application of shelving bracing. This guide is primarily a user's guide outlining some of the characteristics pertaining to the bracing of industrial grade steel shelving. The SMA has developed this guide for the benefit of users including consultants and installers who are involved with the general design, use, installation, and application of industrial grade steel shelving. It is recommended that this document be used in conjunction with shelving that has been manufactured to ANSI MH 28.1, 1982, and installation instructions, drawings or manuals supplied by the manufacturer.

This guide is intended to be used only as reference and does not imply any warranty or responsibility by any of the member companies, the SMA or by The Material Handling Institute, Inc. Further, these following guidelines do not assure compliance with applicable federal, state, or local regulations and codes.

COMMENTARY

The proper application of any product requires that it be fit for the intended use. The application of shelving requires the design of adequate bracing for structural stability. The considerations that follow are by no means all-inclusive, but represent some of the more common considerations when designing shelving. Therefore, these considerations must be taken into account when applying shelving.

This guideline is not intended to be a textbook but has been developed only to alert the user to the need for a formal approach to adequate bracing to prevent failure. The shelving manufacturer's staff engineers or consulting engineers should provide specifics for any condition.

DEFINITION OF BRACING

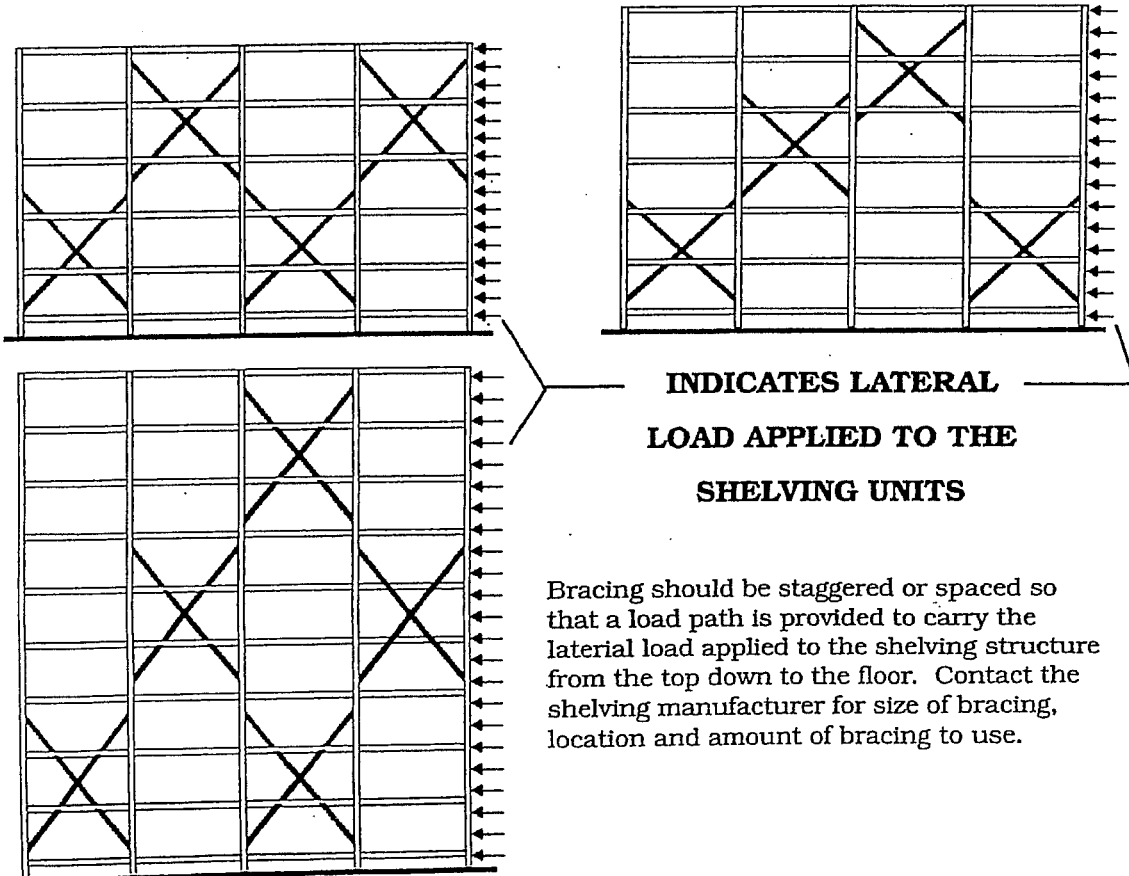
Bracing, as related to shelving, is a physical member usually made of steel—flexible or rigid—whose function is to support, sustain, buttress, prop or bolster the structure surrounding it in an upright or plumb position.

PURPOSE OF BRACING

There are two primary reasons to adequately brace a shelving storage structure.

1. To provide stability and resistance against lateral (horizontal) forces induced by the following possible conditions.
 - A. Out of plumb: While the ANSI specifications restrict out of plumb to 1 inch in 10 feet, this small allowance will create a lateral force. (About 0.833% of the vertical dead load plus live load in each unit of shelving.) Out of plumb is usually caused by uneven floors and minor looseness or flexing of connections.
 - B. Other external forces such as wind (if outdoors) and seismic forces; if a structure is to be designed to resist possible earthquake or wind forces, the lateral load may be of such magnitude that additional bracing is required.
 - C. Impact by carts, jacks, vehicles: These vehicles impart load factors and forces that are difficult to define in quantitative terms. However their existence should be considered and provided for if the installation is adjacent to high-traffic areas. (The shelving itself being hand loaded.)
2. To provide for post stiffness.

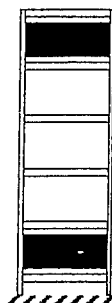
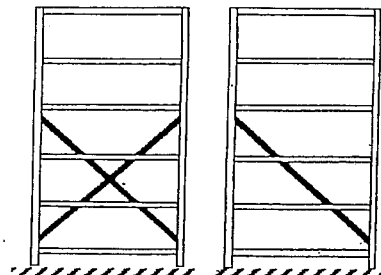
The ability of the shelving post to carry gravity loads is heavily affected by the "effective" unbraced length of a post. Bracing reduces side sway or movement of the shelving structure. It also can substantially reduce the effective unbraced length of the post, thereby allowing the post to carry more load. The type of bracing used in the shelving structure is critical in determining the effective unbraced post length. Analysis should be conducted for every unusual situation.



Bracing should be staggered or spaced so that a load path is provided to carry the lateral load applied to the shelving structure from the top down to the floor. Contact the shelving manufacturer for size of bracing, location and amount of bracing to use.

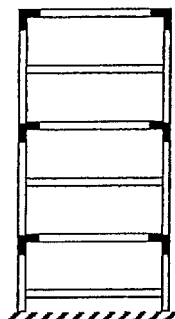
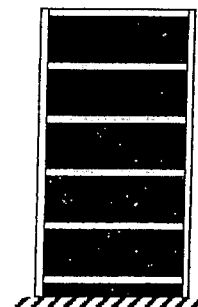
TYPES OF BRACING AND EXAMPLES

1. Cross bracing is generally used for open-type shelving (side and back sway braces). Usually one or two diagonal bars at various locations in the shelving structure, depending on conditions,



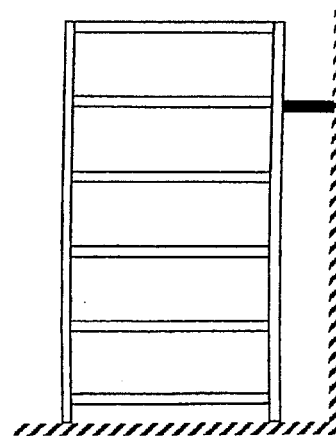
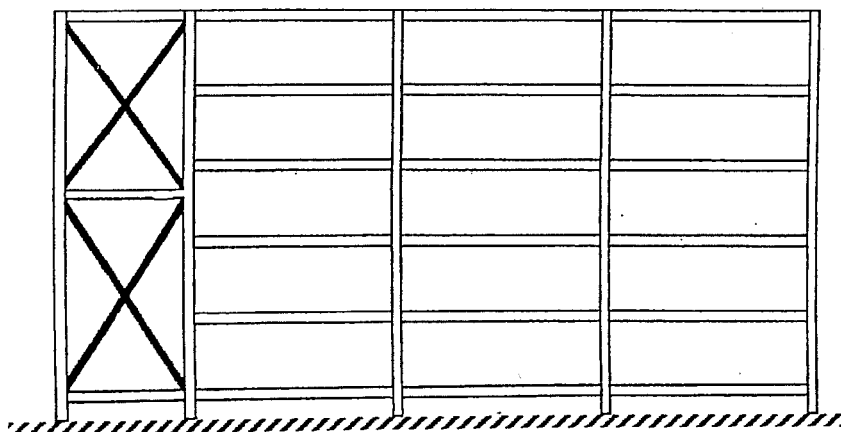
2. Partial panel (panel sway brace). Usually a light gauge narrow panel used to make an open upright assembly.

3. Full panel, also referred to as closed shelving (closed upright and back). Usually light gauge, running from bottom to top of shelving unit. Full panels should be attached to the columns at sufficiently close intervals to be effective as a bracing element.



4. Moment connection (corner angle brace, spreaders and beams). Usually a corner brace rigidly located at post to shelf position. Spacing of moment connections may vary depending on load conditions. Contact shelving manufacturer for recommendations.

5. Anchor to rigid structure "towers" or building (if building has been designed to take this load).



BRACING RECOMMENDATIONS AND OTHER CONSIDERATIONS

1. When checking for adequacy of connection and members, the bolt, brace and post it attaches to should be analyzed to determine the weakest member.
2. Very special attention should be given to a "pass thru" (no sway bracing) situation, as this makes the design of adequate bracing a much more complex consideration. This is the moment connection type of bracing.
3. Bracing should be attached as close to the bottom of posts as possible.
4. To derive the best benefit from sway bracing, it should connect the posts as close to shelf levels as possible.
5. Top ties are normally used where overturning of units is evident. The top tie provides horizontal stability by connecting single faced units to double faced units which normally corrects the overturning problem.
6. Cross aisle supports used in two level or multi-level shelving provides a labyrinth, which connects all shelving units together by the attachment of decking material in the aisles to form one large mass which helps to stiffen the installation.
7. Floor anchors are used to prevent movement or overturning due to seismic considerations.
8. Also, upright assembly anchoring should be used when the top loaded shelf is over 8' 3" (2.5m) high and the height to depth ratio of shelving exceeds four (4).