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MULTI-LEVEL BOX EDGE PLUS® STEEL SHELVING

INSTALLATION INSTRUCTIONS

RETAIN THIS MANUAL FOR FUTURE REFERENCE

!!

Before proceeding with this installation, check dates for the most current version of all sections

Read all instructions before proceeding with installation or shelf loading.

Vital product information pertaining to proper set-up, safe loading and cautions are included.

Failure to follow these instructions may cause shelving failure which may result in personal injury and/or property damage.

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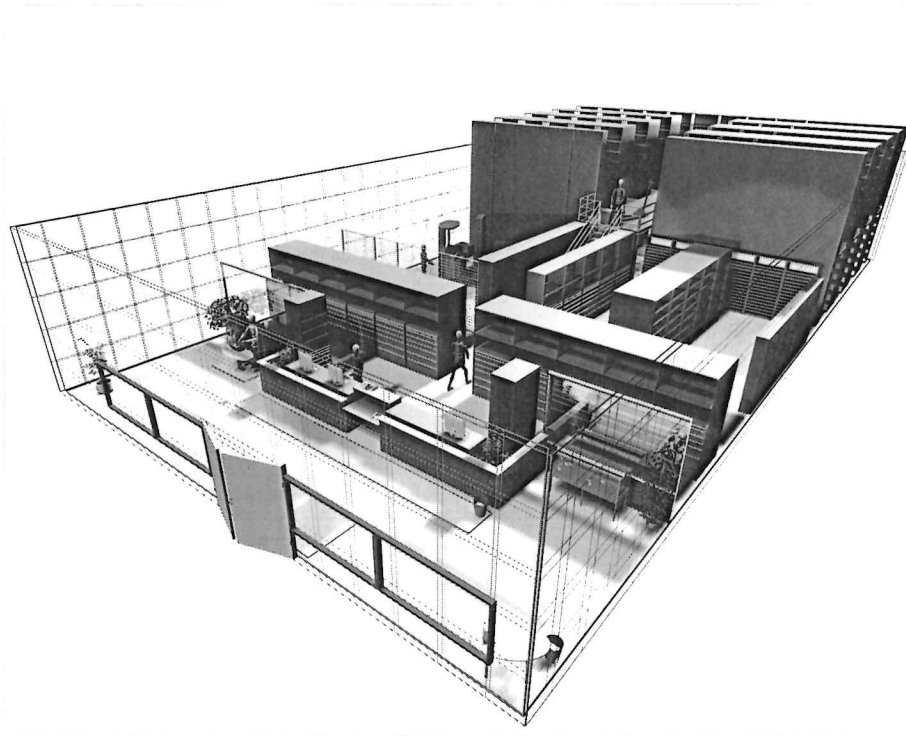
1.0 INTRODUCTION

1.1 General

Borrighs Steel Shelving is easy-to-use, versatile and has a proven record of durability in thousands of installations worldwide. We understand your responsibilities and provide cost efficient solutions to solve your particular problems. We are storage experts and we will assist you with every phase of your project, from planning and layout through installations and start-up. And every part of your system will be catered to your operation's individual needs.

The purpose of this manual is to provide product information and installations best-practices regarding our **Multi-Level Box Edge Plus® Steel Shelving**. In this setting, units can be added on top of existing shelving to create or expand multi-level systems. With proper planning, future vertical expansion can also be easily accommodated.

Multi-level and high-rise storage systems are designed to maximize the use of floor space by taking advantage of unused overhead space (cube) available in existing facilities. These systems are a cost-effective alternative to new construction.



1.2 System definition

A multi-level system will be comprised of the following components:

Front Foot Plates, Back-To-Back Foot Plates – Allow post weight distribution and floor anchoring. Provide two 3/8" diameter holes for floor bolts as well as a single hole for locating shim plates.

Front Shim Plates, Back-To-Back Shim Plates – Easily matched to each foot plate, front and back-to-back, with centering dimple. Provide also matching holes for floor-anchoring installations. The shim plate's 1/16" thickness makes estimating the quantity needed easy.

Beaded Posts, Angle Posts, High-Rise Posts – Each one has a specific positioning within the shelving system to provide additional clear shelf space and wider shelf opening. With 1 ½” centers, they allow the attachment of accessories and have an off-set formed into the side flange for added strength and for shelf bracket clearance.

Beaded Posts Closed Sides, High-Rise Posts Closed Sides – Spot welded with a beaded post or high-rise post in the front and an angle post in the back, the addition of an angle post bolted to the rear post will provide an intermediate closed side at minimum cost.

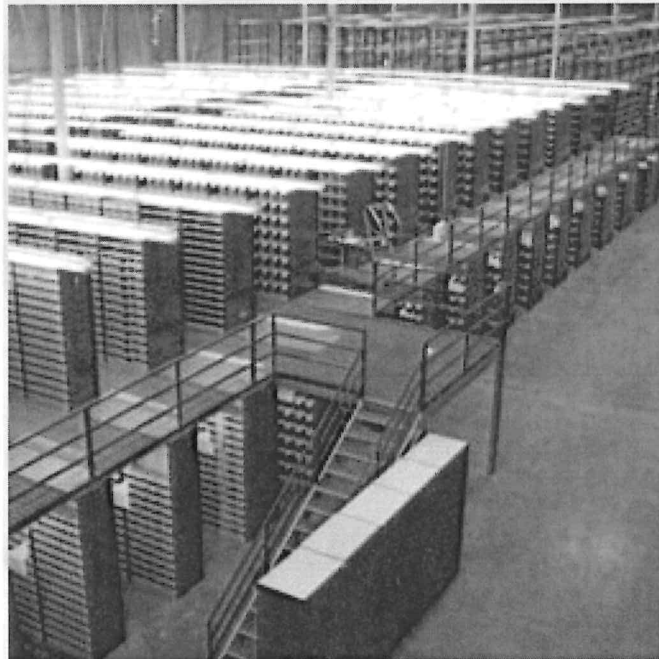
Shelving Backs – For heights over 8’3”, use combinations of smaller sizes, overlapping in the middle. Center row accommodates back clips.

Base Strips – Used to fill in the space between the bottom shelf and the floor. Also prevent dirt and refuse from getting under the unit.

BOX EDGE PLUS® Shelves – Strong and rigid, this shelf is designed to handle impact or point loads and is fully compatible with all existing shelf brackets and posts.

Shelf Support Brackets – Provide twice the support area of most other shelf supports. These brackets let you install and later adjust shelves quickly and easily, without disturbing other shelves.

Catwalk Shelving System – Utilizes aisles attached to the shelving itself and a second (or third, or more) of shelving, either vertically continuous from or stacked as an extension of the lower level shelving. This requires post-to-post match-ups between levels.



Post Splicers: Corner Post Splicer, Splicer Plate, Splicer Bar, Beaded Post Splice Kit – These are used to add height to new or existing installations over 16’3”.

Mezzanine Brackets, Mezzanine Beams – These brackets are designed to hold the beams and can be used as left or right hand support and will fit on the posts. The beams have top flange holes for attaching different types of decking.

Catwalk Beams – Require no bracket, attach directly to posts, and designed to give maximum load bearing capabilities. Available for angle and beaded posts, these beams support decking at same height as mezzanine brackets and beams.

1.3 Hardware

Unless otherwise stated, all necessary hardware is included in the catalog number and will be shipped as part of the total hardware requirement.

Borroughs uses only Grade 5 bolts for all bolted, structural connections.

The following hardware groups are used in the installation and are added to the parts that needed at the time of shipping:

Hardware Group 109

Qty (08)	07742-00	Keps Nut ZP 1/4-20
Qty (04)	10467-00	Hex Screw Grade 5 1/4-20x3/4
Qty (04)	10466-00	Fastener Hex Screw Grade 5 1/4-20x5/8

Hardware Group 118

Qty (18)	07742-00	Keps Nut ZP 1/4-20
Qty (18)	10466-00	Fastener Hex Screw Grade 5 1/4-20x5/8

Hardware Group 119

Qty (08)	15990-00	Fastener HX Washer HD TFS 10-24x3/8
Qty (04)	10466-00	Fastener Hex Screw Grade 5 1/4-20x5/8
Qty (04)	07742-00	Keps Nut ZP 1/4-20

Hardware Group 120

Qty (00)	50270-00	Instructions High Rise Installation
Qty (04)	07742-00	Keps Nut ZP 1/4-20
Qty (04)	10466-00	Fastener Hex Screw Grade 5 1/4-20x5/8
Qty (08)	27035-00	Fastener Pan Head Rolok Screw ZP

Hardware Group 235

Qty (04)	07742-00	Keps Nut ZP 1/4-20
Qty (04)	94140-42	Fastener Hex Head Screw Grade 5 1/4-20x1-1/4

Hardware Group 239

Qty (03)	07742-00	Keps Nut ZP 1/4-20
Qty (03)	10467-00	Hex Screw Grade 5 1/4-20x3/4

Hardware Group 240

Qty (12)	07742-00	Keps Nut ZP 1/4-20
Qty (12)	10466-00	Fastener Hex Screw Grade 5 1/4-20x5/8

Hardware Group 300

Qty (00)	50270-00	Instructions High Rise Installation
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Hardware Group 355

Qty (01)	07742-00	Keps Nut ZP 1/4-20
Qty (01)	94140-42	Fastener Hex Head Screw Grade 5 1/4-20x1-1/4

Hardware Group 452

Qty (04) 07742-00 Kep Nut ZP ¼-20
Qty (04) 10467-00 Hex Screw Grade 5 ¼-20x3/4

Hardware Group 859

Qty (01) 29467-06 Fastener Hex Head Bolt Grade 5 5/16x1-1/4
Qty (01) 27678-02 5/16-18 Locknut with Nylon

Hardware Group 862

Qty (02) 150448-00 ¼-20x2-1/2" Hex Head Cap Screw
Qty (02) 07742-00 Keps Nut ZP ¼-20

Hardware Group 863

Qty (03) 29467-06 Fastener Hex Head Bolt Grade 5 5/16x1-1/4
Qty (03) 27678-02 5/16-18 Locknut with Nylon
Qty (01) 11154-00 #14x1" Hex Washer HD SDS

Hardware Group 867

Qty (03) 25052-00 #10-1/2 Pan Head Sheet Metal Screw

Hardware Group 881

Qty (04) 10171-00 Hex Head #10-16x1" SDS

Hardware Group 889

Qty (03) 39184-00 Fastener Phillips Pan Head #10-16x3/4

Hardware Group 947

Qty (04) 07866-00 Fastener Hex Head Cap Screw ZP ¼-20x3/4
Qty (04) 07849-00 Fastener Flat Washer ¼
Qty (04) 07742-00 Kep Nut ZP ¼-20
Qty (02) 74156-49 Screw Cap Hex HD 3/8 16x1
Qty (02) 44133-00 3/8-16 Nylon Locknut

Note: Other tools, hardware and supplies may be required based on customer requirements and site conditions.

1.4 Important steps prior to installation

Compare the Packing Slip with material received and confirm that

- ↓ The material is in good condition,
- ↓ The piece count is correct,
- ↓ The parts received are the parts ordered by the customer.

If there are any inconsistencies or shortages of material, contact a Borroughs' representative immediately or the salesperson responsible for the project.

Compare the Floor Plan (detailed drawing submitted by salesperson) to the job site and confirm all dimensions necessary to the installation.

2.0 INSTALLATION

2.1 General instructions

In preparing for multiple section installations, it is recommended that a floor plan with elevations be available at the job site.

It is further recommended that the floor be marked to indicate all datum lines, where the rows and aisles will be, so that the distributed material can be stacked for minimal interference. This will also show where obstructions may occur. Now the sections may be erected along the lines so that once the row is in place everything can be tightened and each section will remain square.

Rough or uneven floors should be compensated with shims. It is also required that sections not be out of plum more than 1" in 10' or more.

Wall, floor or top tie anchoring is recommended for units when the height to depth ratio exceeds 4.

2.2 Basic data and special notes

Unit widths are shown as actual with dimensions taken from the center line of the Beaded Post and High Rise Post (example: Nominal 48" / Actual 48 1/16").

Unit depths are shown as actual with dimensions taken from the face of the Beaded Post and High Rise Post to the back of the unit (example: Nominal 24" / Actual 24 1/2").

Actual clear opening between Beaded Post is nominal width minus 1".

Actual clear opening between High Rise Post is nominal width minus 2".

Actual vertical clearance between shelves is equal to center-to-center shelf spacing minus 1-7/32".

Vertical adjustments based on 1-1/2" centers.

Shelving bays to be anchored at foot plate locations, front and back.

Approved anchor to be HILTI KB-TZ 3/8" x 3 3/4" only, subject to seismic and code requirements.

All Top of Steel (T.O.S.) levels must be level to within $\pm .125"$.

Use specified fasteners for all connections only and make sure they are correctly installed and fastened.

Do not pre-drill ESD screws (decking).

Plum Level tolerance should be $\pm .25 @ 120"$.

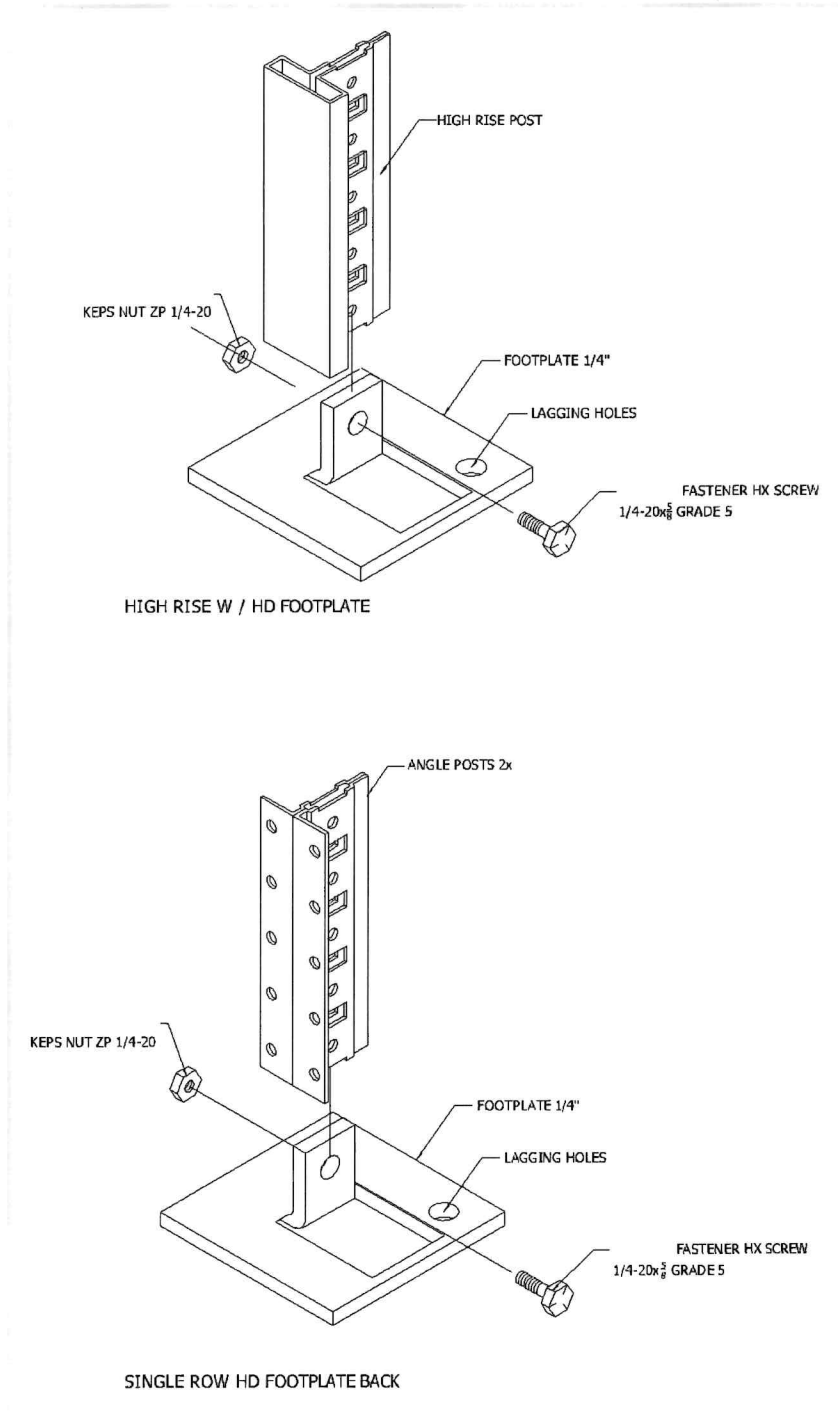
Back Panel Bow should not be greater than .25".

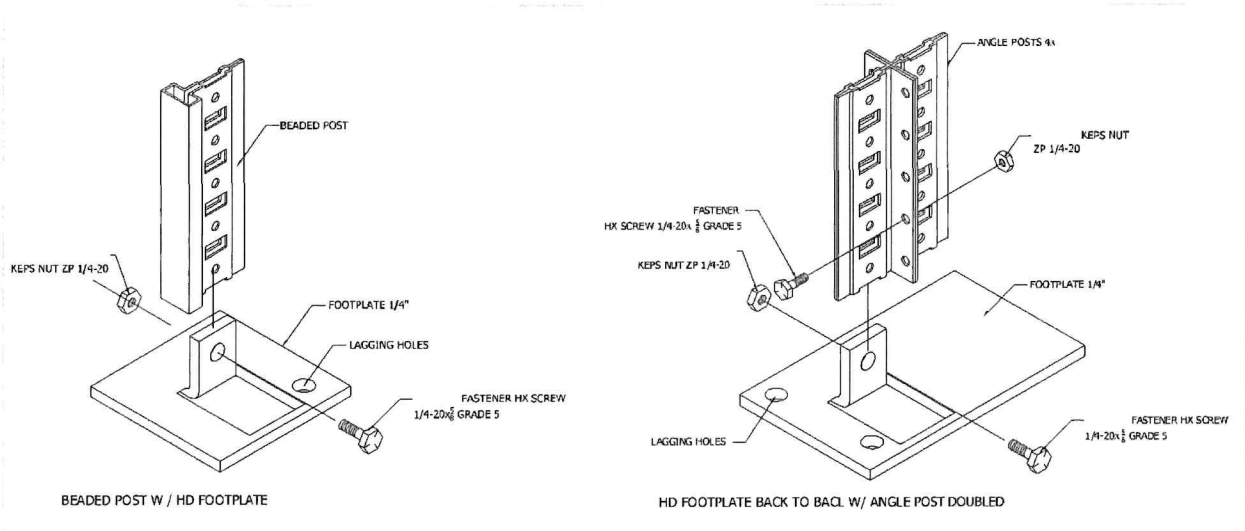
Back Panels must be installed in a "tucked fashion" (Lower Panel Back overlapping the Upper Panel Back).

2.3 Installation procedures

The following steps follow a logical order of sequence, although in some instances multiple procedures can be accomplished at the same time.

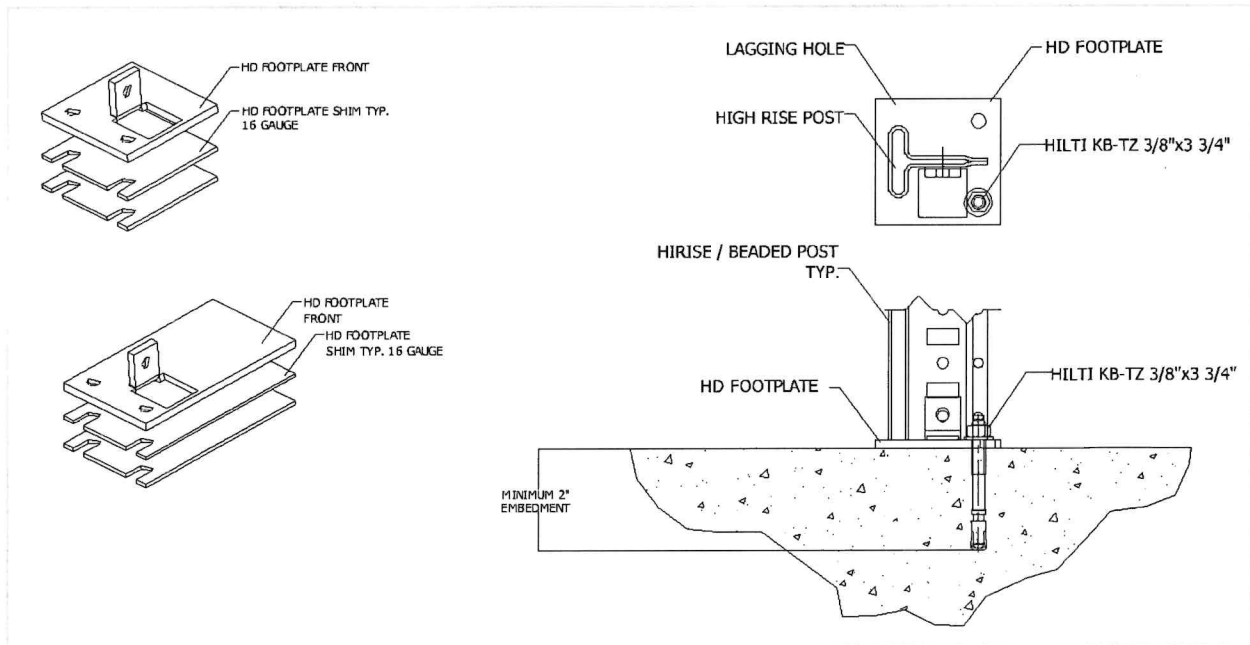
2.3.1 Footplates and shims





Here is when the installer needs to make sure that all the datum lines match the footplates/posts locations, and check for uneven surfaces to compensate using shims under the footplates.

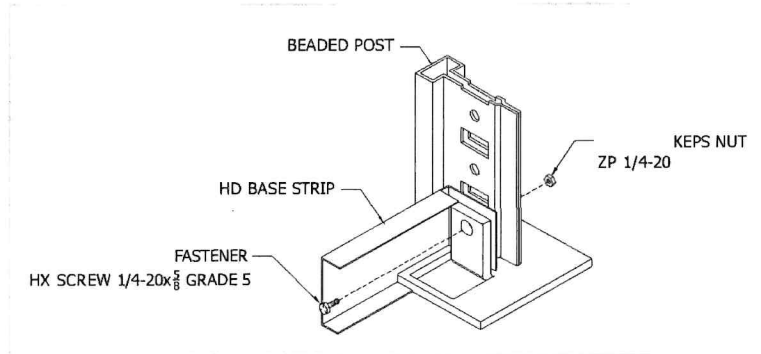
The total amount of shims used under a footplate should not exceed the 1/2". Usually two shims per footplate are enough to even the floor.



Notice the 3/8" diameter holes in the footplates: the side holes for anchoring and the center hole for shimming.

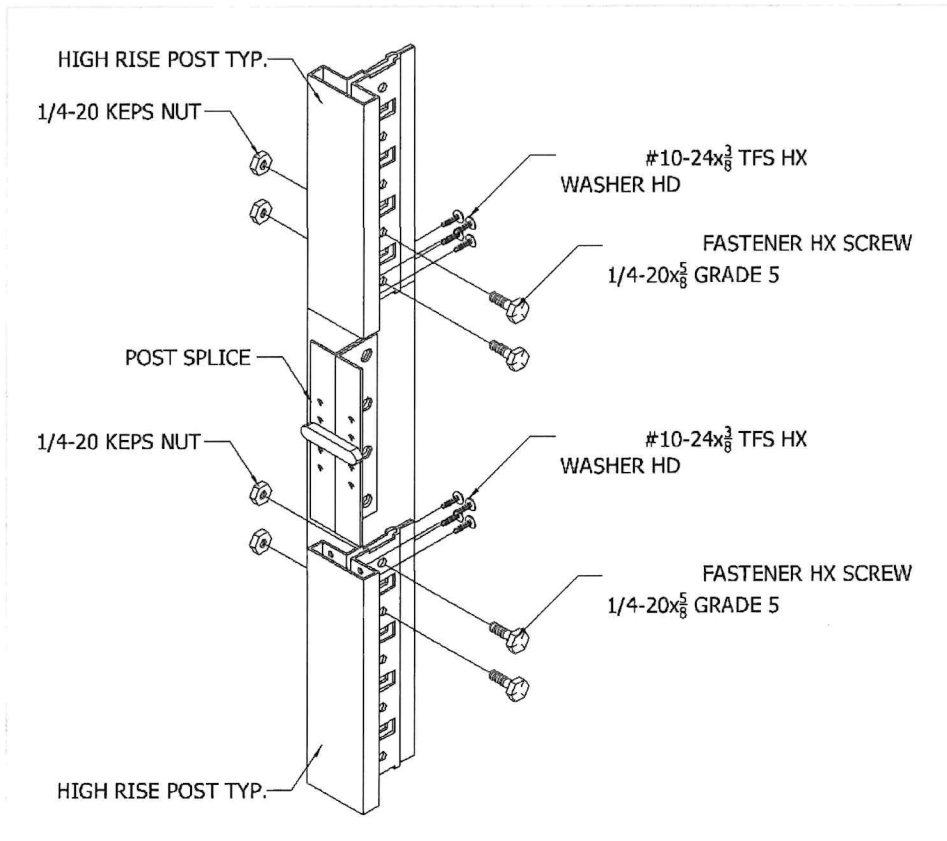
2.3.2 Base strips

Base strips are usually placed right after the footplates/shims and posts are in place. This helps to set up the spacing between shelves considering the free space above the base strips.

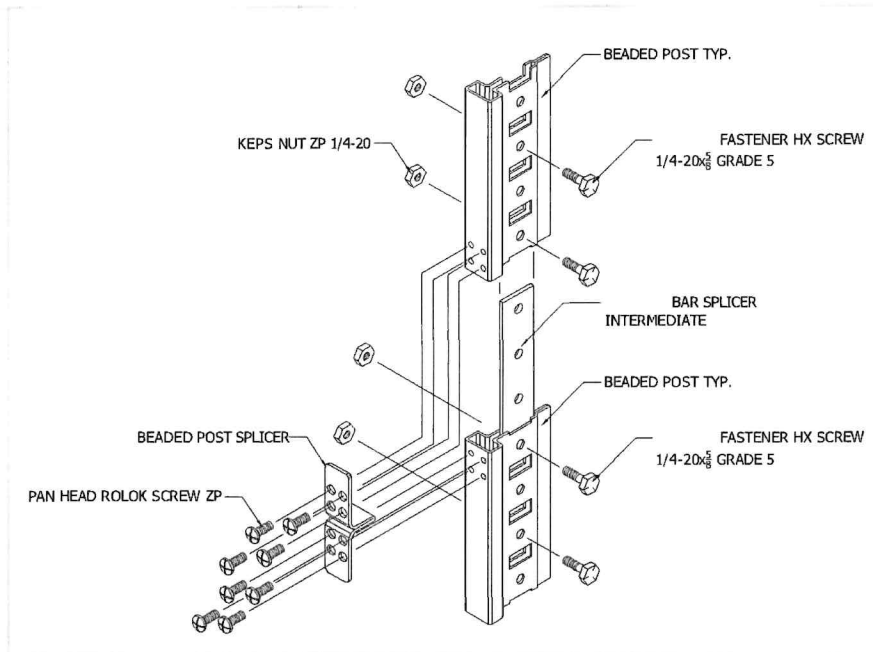


2.3.3 Posts splicers

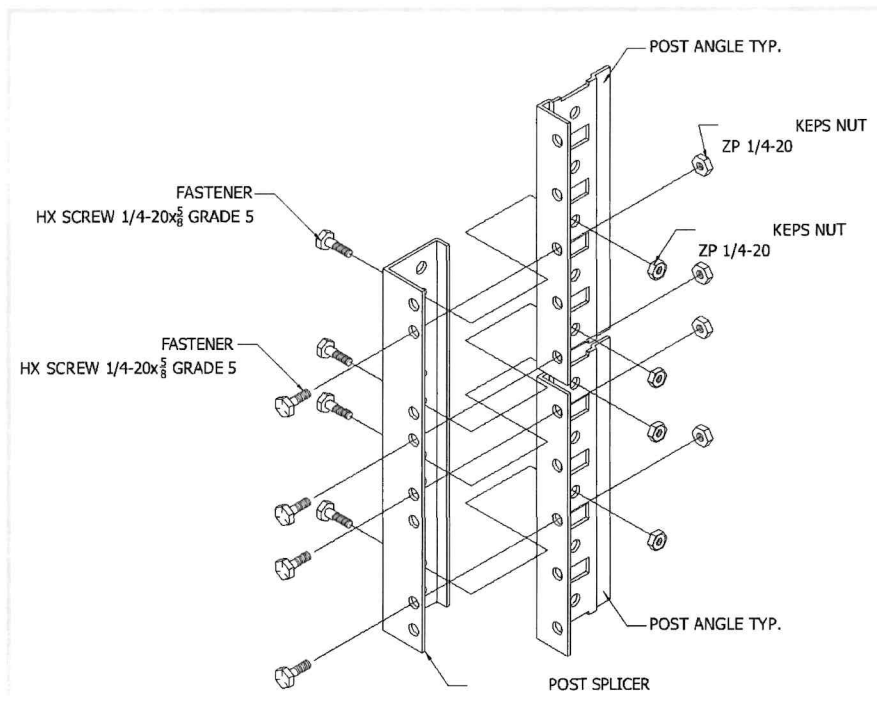
The high-rise post splicer kit provides front-to-back as well as lateral support. Parts are joined with eight self-drilling screws and four bolts with the upper post resting on a 1/4" steel support plate. Notice that the splice occurs within the post creating a neat finish.



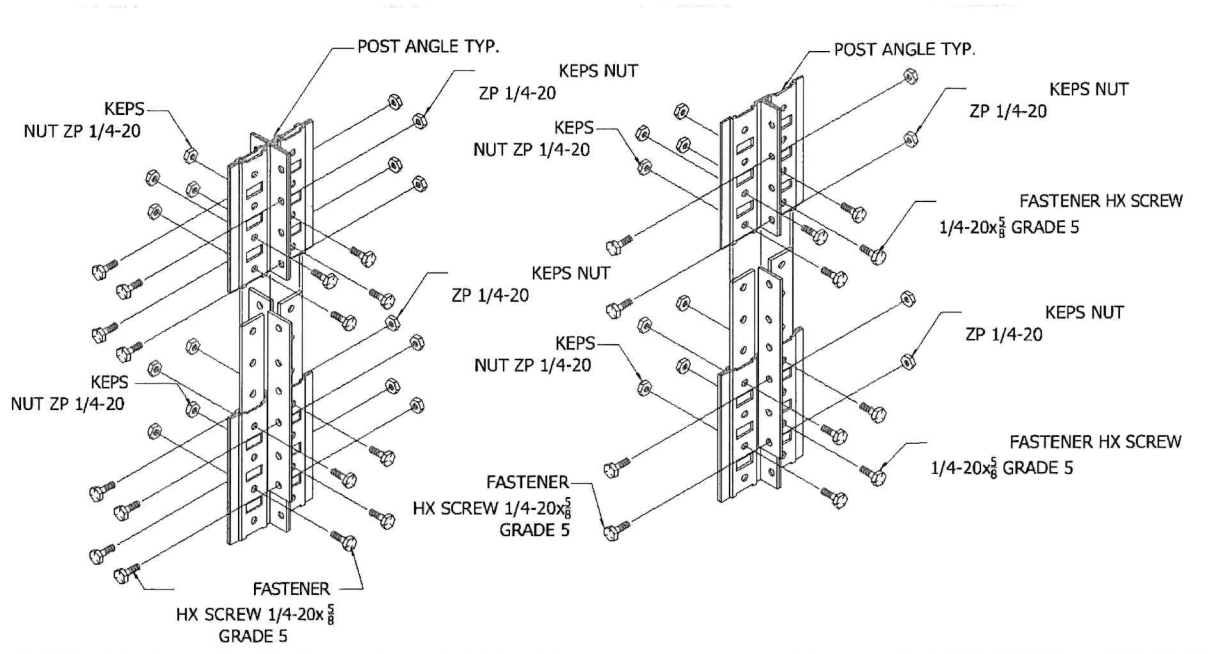
The beaded post splicer consists of steel plate welded at right angles to a front plate, which is attached with self-threading screws. It also includes a splicer bar.



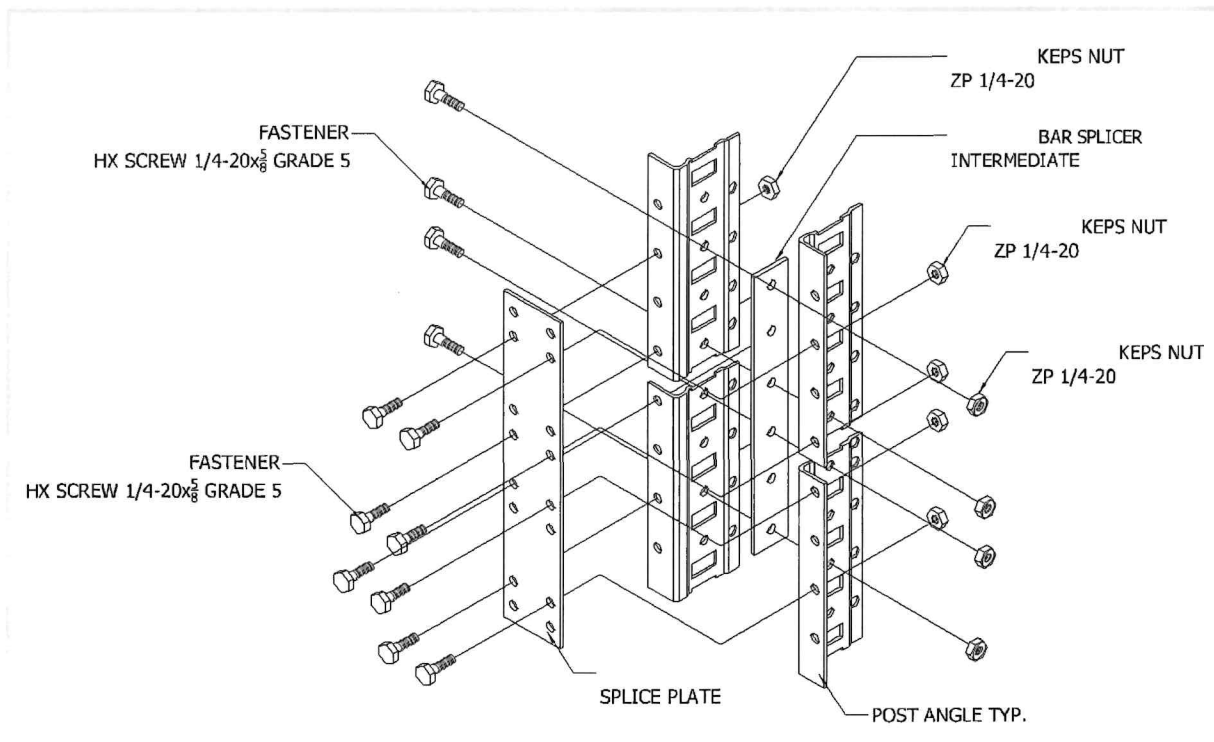
Below is the corner post splicer, used to connect corner angle posts on the ends of rows.



The angle post back-to-back splice is bolted between two angle posts, as shown below.

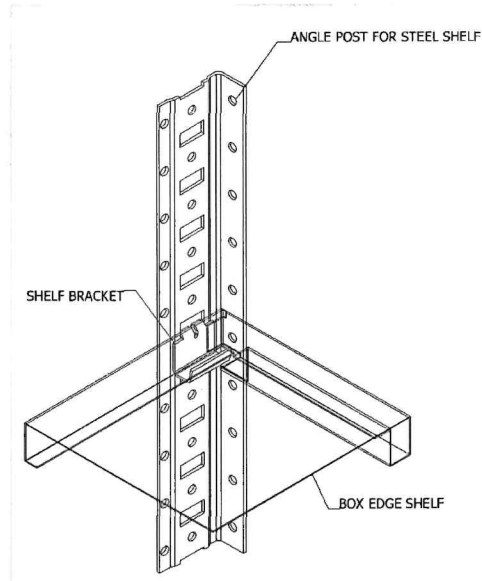


Finally, we have the splice kit single row back. See details below.



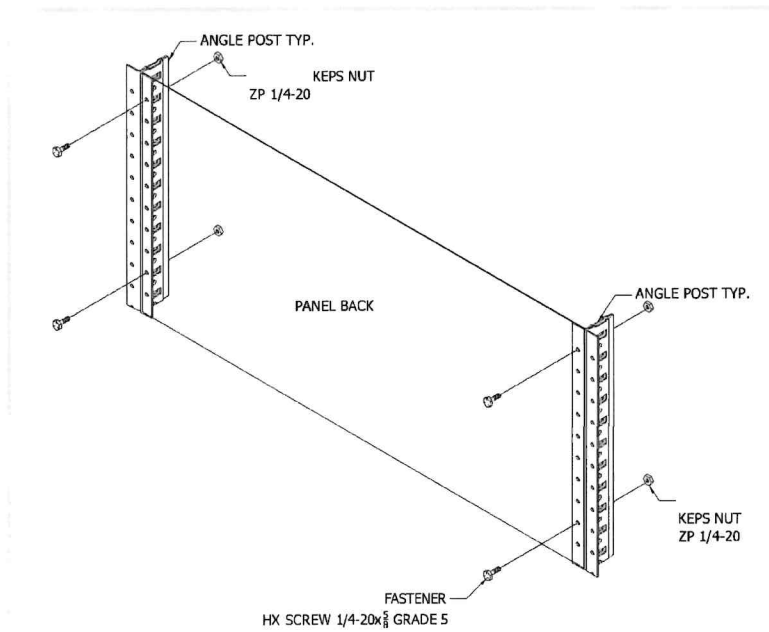
2.3.4 Shelving

The detail below shows how the box edge shelving and its clip attach to the angle post.

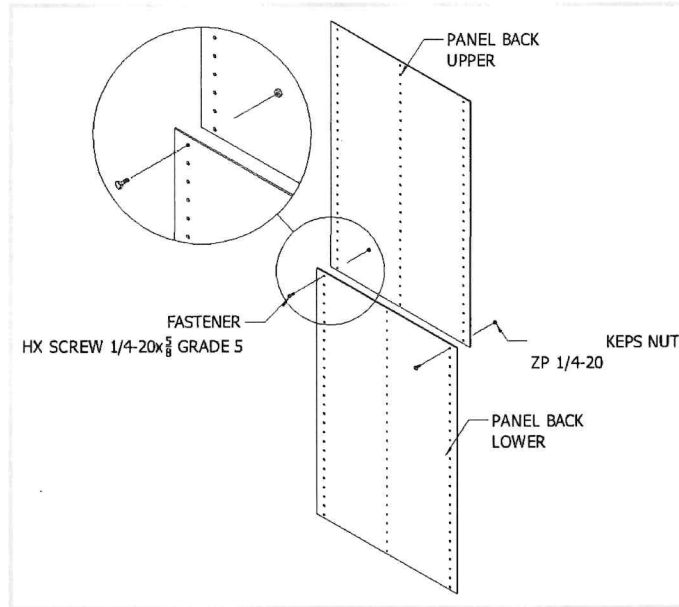


2.3.5 Back Panels

Notice how the back panels are bolted onto the angle post, using the very last hole at the top and the first to last hole at the bottom (not the last one). This allows the attachment of more than one back, if needed, using the last bottom hole overlapped with other panel.

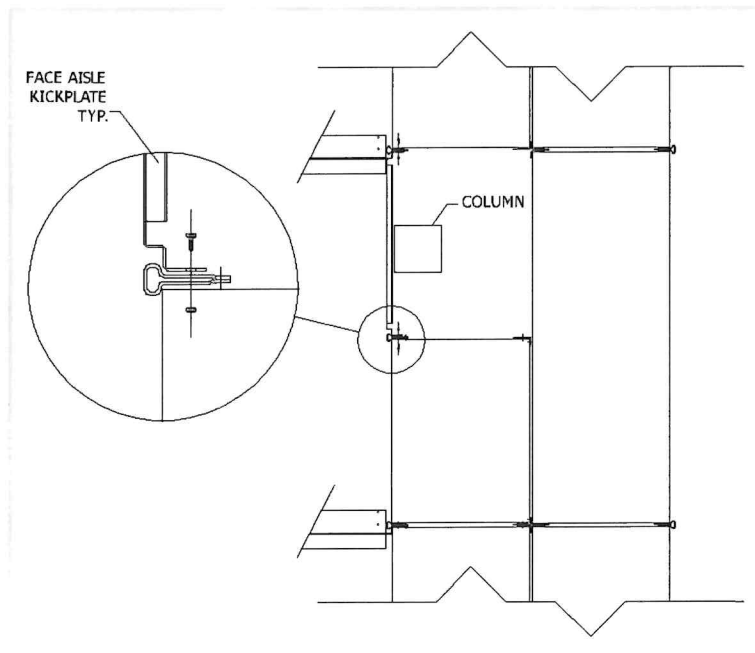


Back Panels must be installed in a “tucked fashion”, meaning that the lower back panel should always overlap the upper back panel. See the details below.



2.3.6 Kickplates

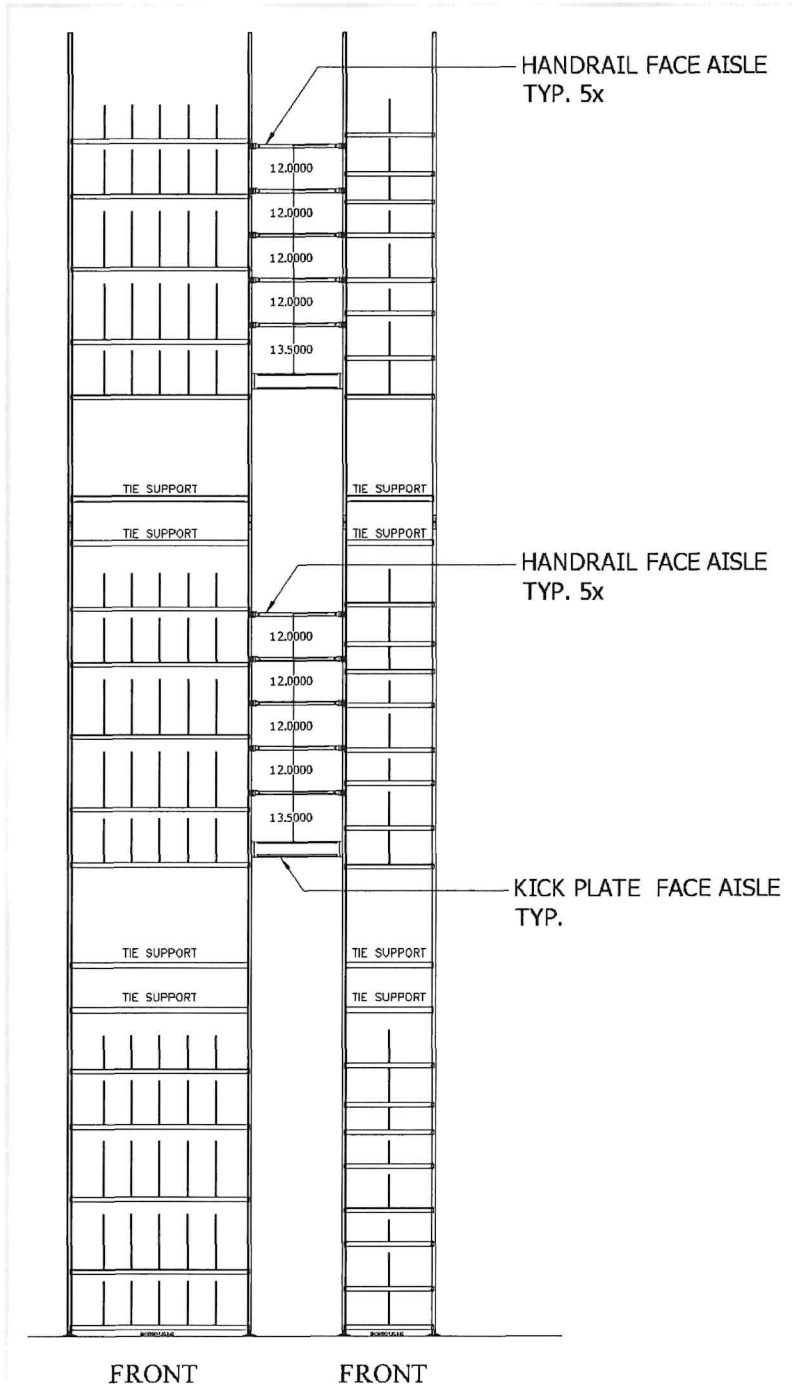
The columns in the building should be hidden between shelving whenever possible. A kickplate is used in front of the column to connect the shelving located at both sides of it.



If the column cannot be totally hidden between shelving, then an extension is made in order to adjust the kickplate. The assembly detail is shown below.

Also, a situation may arise where two kickplates are needed on both sides of the shelving to bury a column located right in the middle of back-to-back units.

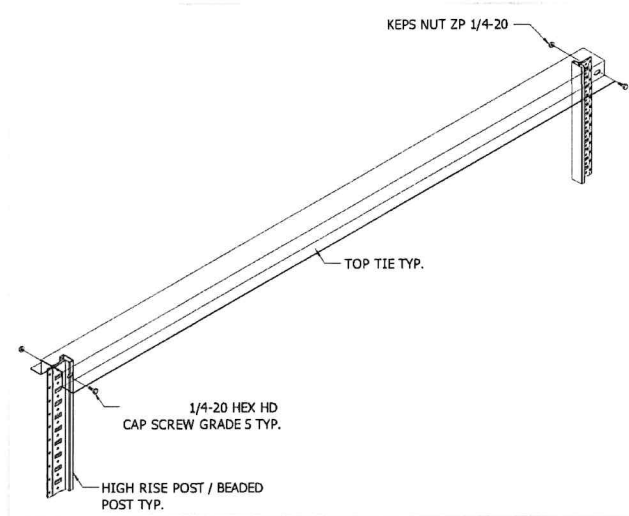
When the kickplates are used, the shelving units will also have a handrail connecting them all the way to the top. This is a safety feature for that open space.



2.3.7 Ties and beams

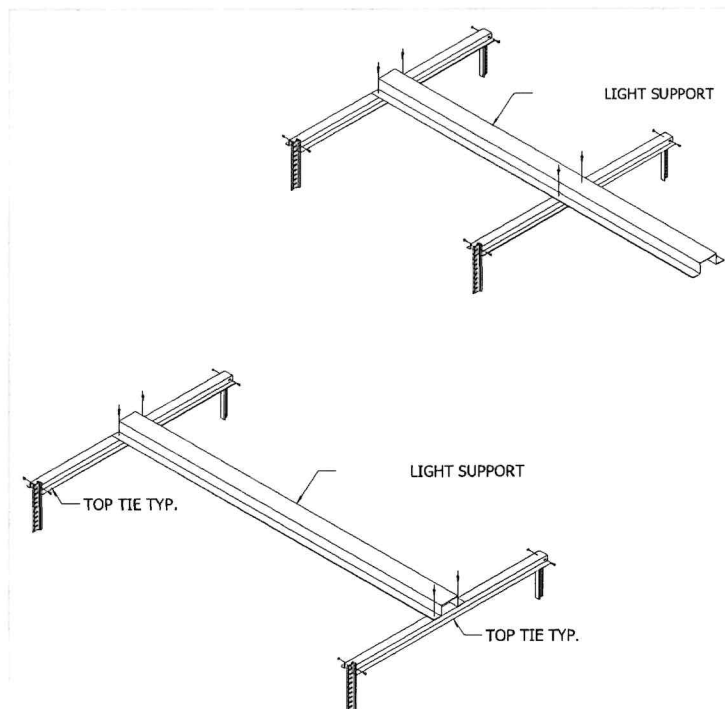
The different types of ties and beams are designed to provide support to the catwalk systems and mezzanines.

Top tie assembly



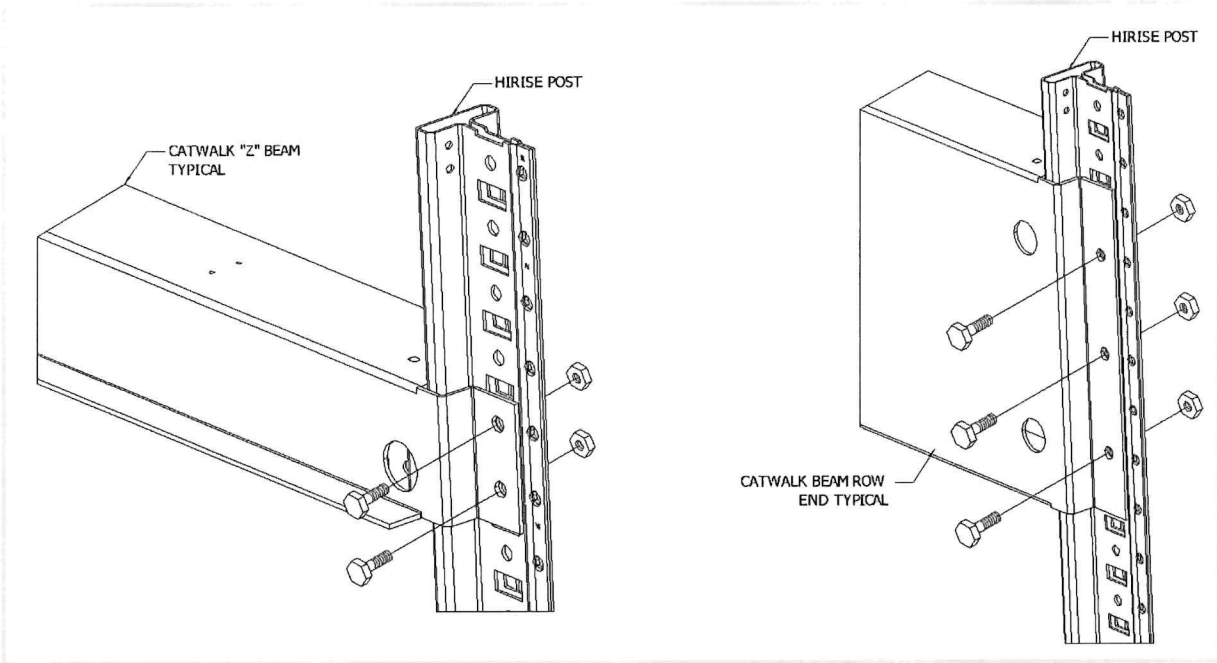
Light support assembly, depending on the length

Notice that these ties and light supports are attached to the beaded posts of the shelving units.

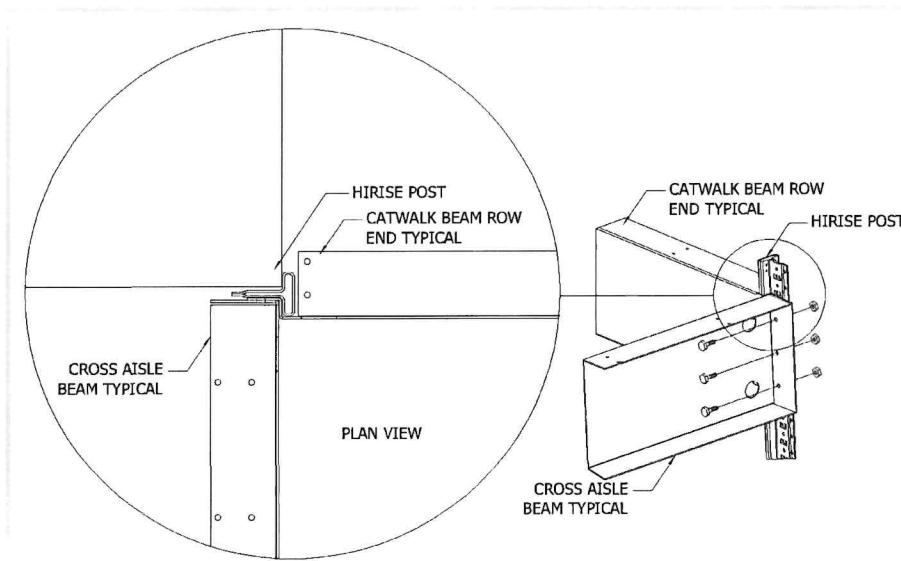


The light support overhang, over the tie support, is used to hang lights at the end of the sections, where no more shelving units are present.

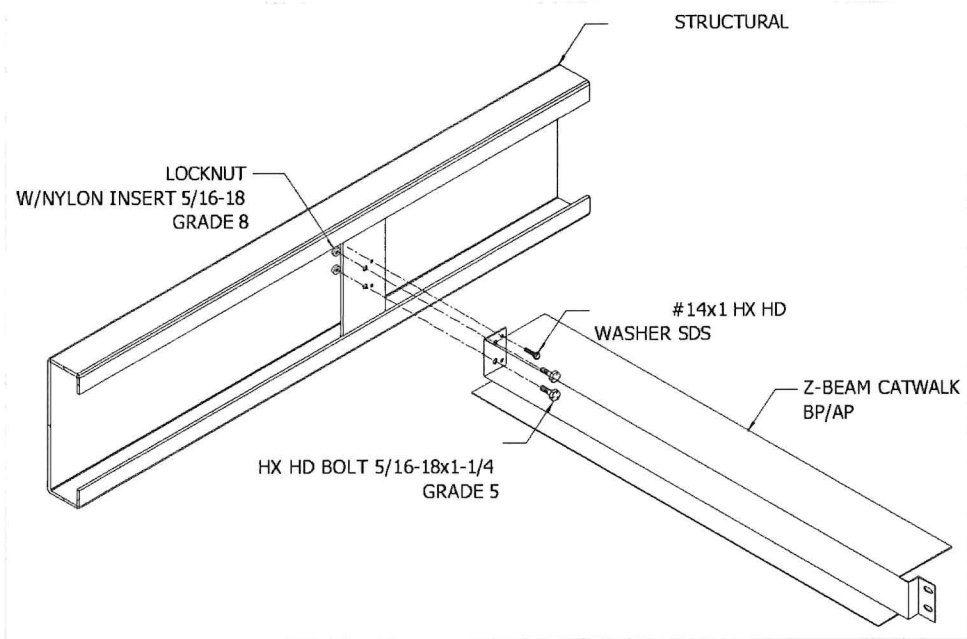
Catwalk Z beam and catwalk beam row end connections



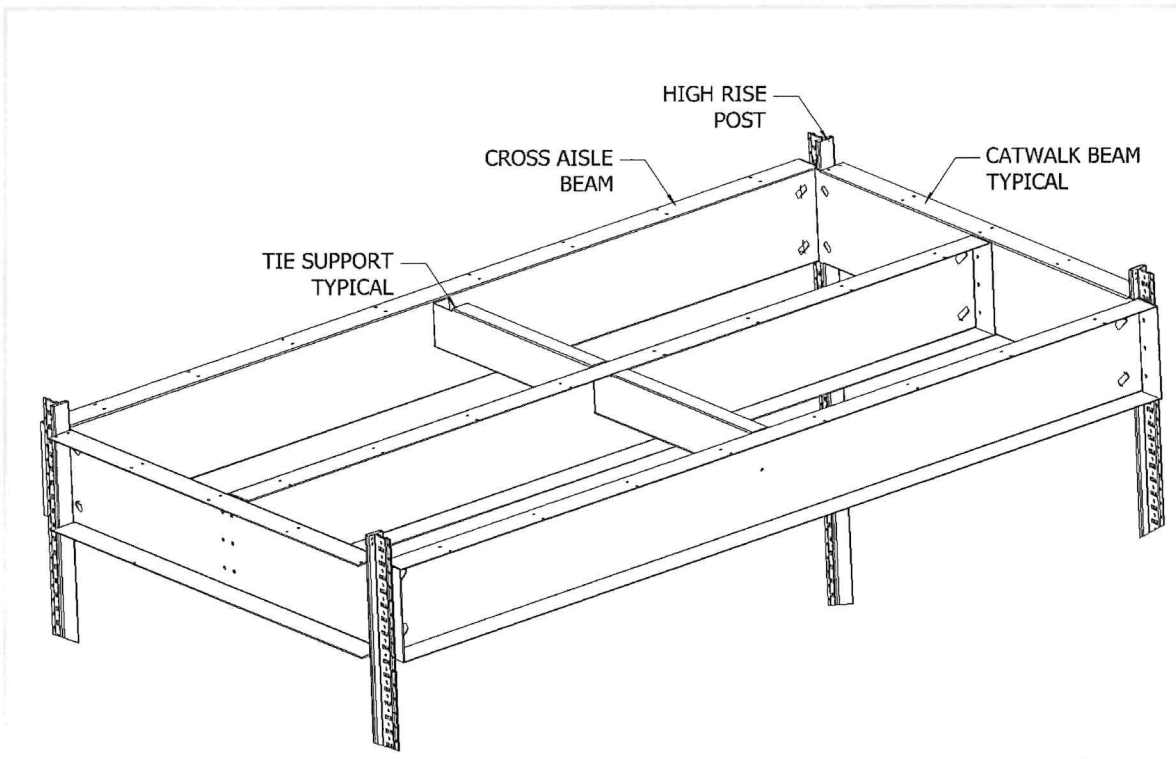
Cross aisle beam connection



Z-beam catwalk AP/BP to structural connection

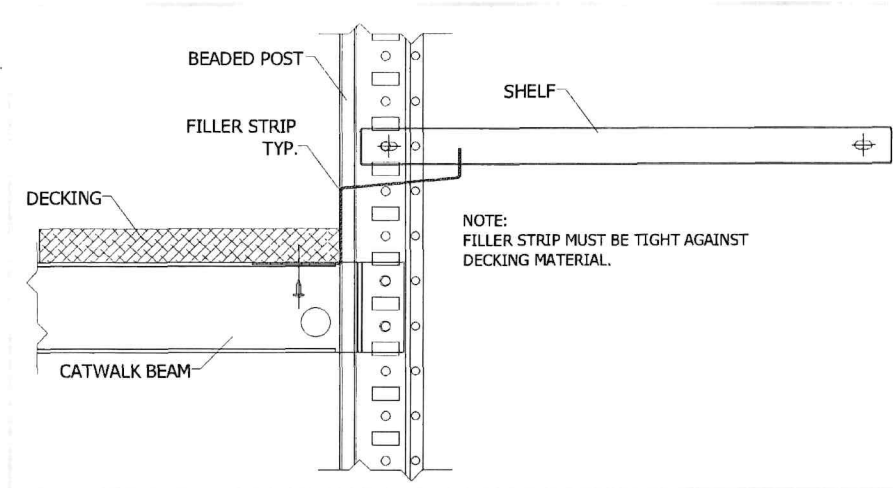


Complete view of cross aisles connections

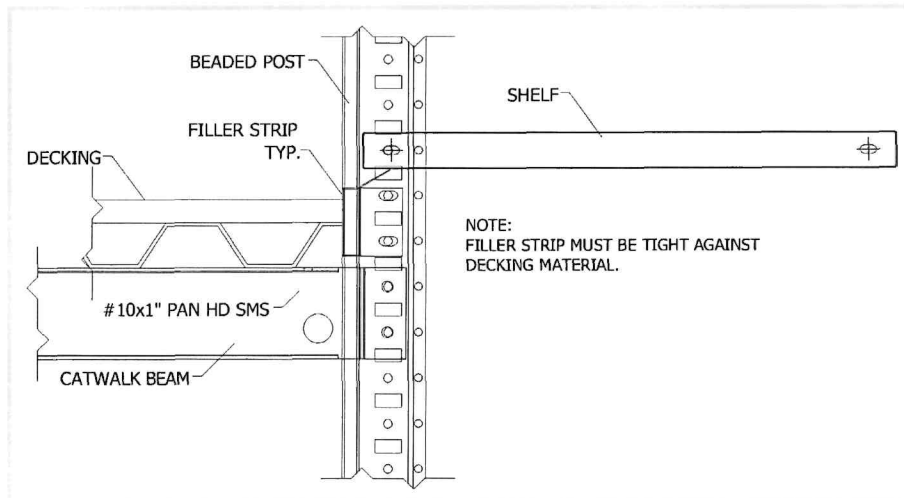


2.3.8 Filler strip

Notice that the filler strip needs to be tight against decking material, wood deck, in this case.



Below, the drawing shows the filler strip installation when corrugated deck is used.



2.4 Final notes

Always refer to the approved drawings laid out for a specific project where additional special installation instructions may be provided. If a special step is recommended in the set of drawings, they automatically super exceed the steps for the same installation here in the manual.

If something is wrongly placed or installed, stop, correct right away and then keep going. Anything that is left out or improperly located can result in damage to the property, installers or system users later on. Double check with the manual whenever in doubt of a certain procedure and make sure everyone involved in the installation have read it.

3.0 AUDIT

3.1 Inspection and clean-up

The system is to be installed with trained supervision in accordance to manufacturer's written instructions. All components should be checked and re-checked for reliability and safe continuous operation. Installers will leave installation in broom clean condition, with system completely installed and ready for use by owner.

During work and before leaving the site, assure that the following points are addressed:

- ___ Installation matches with approved layout.
- ___ All parts shall be secured in place.
- ___ All units shall be fully anchored and in compliance with anchor pattern.
- ___ All hardware tightened appropriately on shelving and support connections.
- ___ Posts splicers shall be correctly installed and properly fastened.
- ___ Decking shall be fully secured according to fastening pattern specification.
- ___ Floor beam support shall be installed correctly according to designed elevations.
- ___ Shims shall be installed were needed to achieve proper level.
- ___ Scratched parts shall be touched up with paint spray as needed.

3.2 System acceptance form

PROJECT NAME/NUMBER _____

IN ORDER TO ACTIVATE YOUR WARRANTY, PLEASE, FILL OUT THIS FORM AND RETURN IT TO YOUR PROJECT MANAGER AT BORROUGHS CORPORATION VIA E-MAIL OR FAX, (269)342-4161.

Customer profile section

COMPANY NAME _____

STREET ADDRESS _____

CITY _____ STATE _____ ZIP CODE _____

CONTACT PERSON _____ TITLE _____ E-MAIL _____

PHONE NUMBER _____ DATE OF INSTALLATION _____

The certificate of warranty has been reviewed. _____ (Initial)
The instructions manual and best practices has been reviewed and accepted. _____ (Initial)
The installation has been inspected and completed with total satisfaction. _____ (Initial)

ACCEPTED BY _____ TITLE _____ DATE _____

SOLD BY _____

WITNESSED BY _____ DATE _____

3.0 DISCLAIMERS

All plan deviations MUST BE APPROVED by Borroughs Corporation and Amazon IN WRITING.

The Bill of Material is subject to change due to the P.E. calculations or local ordinance. Changes that require additional cost will be the responsibility of the customer.

It is the end user's responsibility to provide adequate flooring for the system and its application.

4.0 WARRANTY

Borroughs Corporation extends to the original purchaser from the date of purchase a 5-year limited warranty against manufacturing defects in material and workmanship.

If a Borroughs product fails to perform because of a manufacturing defect, Borroughs will examine it. If product is found defective, it will be repaired or replaced at our option.

This warranty does not apply to any product which has been subject to misuse, negligence, or accident; has been damaged in shipment, storage or installation; has been misapplied or has been modified or repaired by unauthorized persons or been repaired with non-standard Borroughs replacement parts.

This warranty specifically excludes claims for indirect, incidental, or consequential damages arising in any way from a product defect. This warranty is exclusive, and exists in lieu of all other warranties, either expressed or implied.

This warranty gives you specific legal rights; you may also have other rights which may vary from state to state.

To obtain warranty service, contact your Borroughs Selling Dealer. You must make a written claim. Provide a copy of your purchase record and a written description of the warranty problem with your claim. If you are unable to contact you Dealer, Contact: Borroughs Corporation, Customer Service Manager, 3002 N. Burdick Street, Kalamazoo, MI 49004-3483.