

"L" SERIES NEBS COMPLIANT STANDBY BATTERY RACKS ASSEMBLY INSTRUCTIONS

General: These instructions detail the proper procedure for installing C&D Technologies' Powercom Division (C&D) NEBS compliant battery racks. The following describes how to locate, assemble, and load open-frame racks for C&D battery mounting applications. Proper attention to these instructions will help ensure safe, trouble-free performance.

Rack Location: Locate racks in a clean, cool, dry place so the batteries are not affected by sources of radiant heat, such as sunlight, heating units, radiators, steam pipes, etc. Variations of more than 5F (3C) between cells may cause the battery to float and operate at different voltage ranges. Top rows of batteries in multiple-tier configurations tend to operate at slightly higher temperature than those on lower tiers. Always provide adequate ceiling clearance for ventilation and maintenance.

Anchoring: To provide stability, safety, and seismic integrity, racks must be securely anchored to the floor. Anchor bolts are to be installed per vendor's specifications and in accordance with applicable codes. Do not attach rack to walls without consulting C&D first. Mounting holes are provided in the base of each frame. All frames must be secured to floor using all anchor locations. It is the responsibility of the customer to secure racks in accordance with allowable floor loading, applicable codes and regulations.

Grounding: Rack grounding provisions are integrated into the base of each frame. Two 7/16" (11mm) diameter thru holes are located at the center of the frame's bottom cross member and may be used to secure a standard NEMA lug. These two holes have 1.0" (2.54cm) between centers and have been masked and are free of powder coating to allow for electrical contact. Frame to frame grounding integrity is accomplished via the lower support rail, attached to each frame with an Internal/External "star" washer.

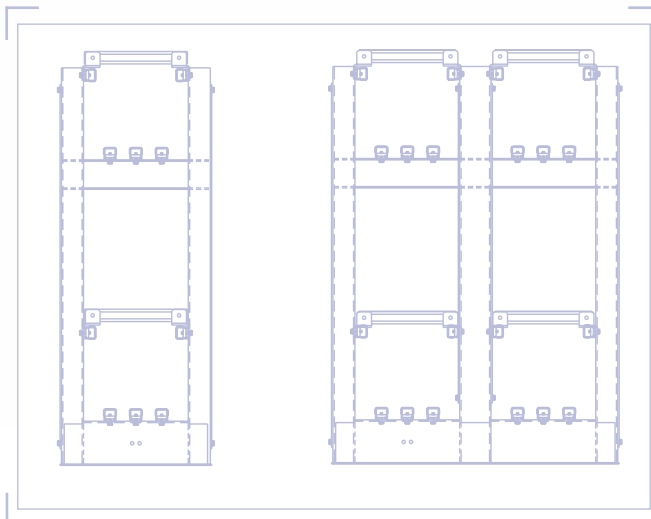


FIGURE #1 End view of 2-tier and 2-tier/2-row racks.

NOTE:

Floor mounting hardware is to be determined in accordance with applicable building codes, not by C&D. For proper certification, a floor anchor must be a minimum or equivalent to an Hilti HSLM12-25.

CAUTION:

Do not install batteries until the rack has been properly installed, with all bolts tightened to specified torque and frames anchored to the floor.

Do not use oil, grease or any other lubricating agent as a lubricant for cell installation. This could void the warranty. Lubrication is usually not required due to the low friction interface of the insulated covers. If necessary, a small amount of water or unscented talcum powder can be applied to the rail covers to reduce friction.

MATERIAL VERIFICATION

Battery racks are shipped unassembled with a complete set of related drawings and documentation. Check received parts and quantities against the rack's Bill of Materials (reference Table #1) on the provided drawing or packing list. Do not assemble rack if parts are missing or quantities are incomplete. Please contact C&D's customer service, 800-543-8630 with any problems.

REQUIRED TOOLS

Torque wrench (0 to 120 ft.-lb.) with hex sockets for 3/8" and 1/2" hardware. Adjustable wrench or 3/8" and 1/2" box wrench, tape measure, square and leveling device.
Note: Consult manufacturers' instructions for tools required to install floor anchoring hardware.

INSTALLATION DETAILS

Bolted connection details are located at the end of installation manual for reference. Torque values for hardware are shown in Table #2.

LOCATION OF RACK

When determining the rack location and floor anchor pattern, use applicable drawings provided with rack shipment. Locate the racks' general position, considering boundary and aisle clearances. Locate floor anchoring locations using provided drawings.

QUANTITIES		BILL OF MATERIALS			
15'	7.5'	ITEM	PART NO.	NAME	DESCRIP
6	4	1	RD02204	FRAME	STEEL, 3.00 X 3.00
20	20	2	RD00200-"L"	RAIL	STEEL, 1.62 X 1.62
20	20	3	RE02447-"L"	COVER	PLASTIC, 1.60 X 1.5
8	8	4	RD00200-14.00	RAIL	STEEL, 1.62 X 1.62
8	8	5	RE02447-14.00	COVER	PLASTIC, 1.60 X 1.5
199	145	6	PH01431P	BOLT	STEEL, 3/8-16 X 1
163	121	7	PH00798P	WASHER	STEEL, 3/8 LOCK
184	136	8	PH00795P	NUT	STEEL, 3/8-16, SER
36	24	9	PH02248	WASHER	STEEL, 3/8, INTERNA
36	24	10	PH01983P	BOLT	STEEL, 1/2-13 X 1

TABLE #1 Sample Bill of Material.

TORQUE VALUES

Hardware Type	Torque Value
3/8"-16 Bolt, Nut and Lock Washer	15-20 Ft.-lbs. (20-27 N•m)
1/2"-13 Bolt, Nut and Lock Washer	55-65 Ft.-lbs. (75-88 N•m)
3/8"-16 Bolt, Strut Nut and Lock Washer	19 Ft.-lbs. (25 N•m)

TABLE #2 Torque Values.

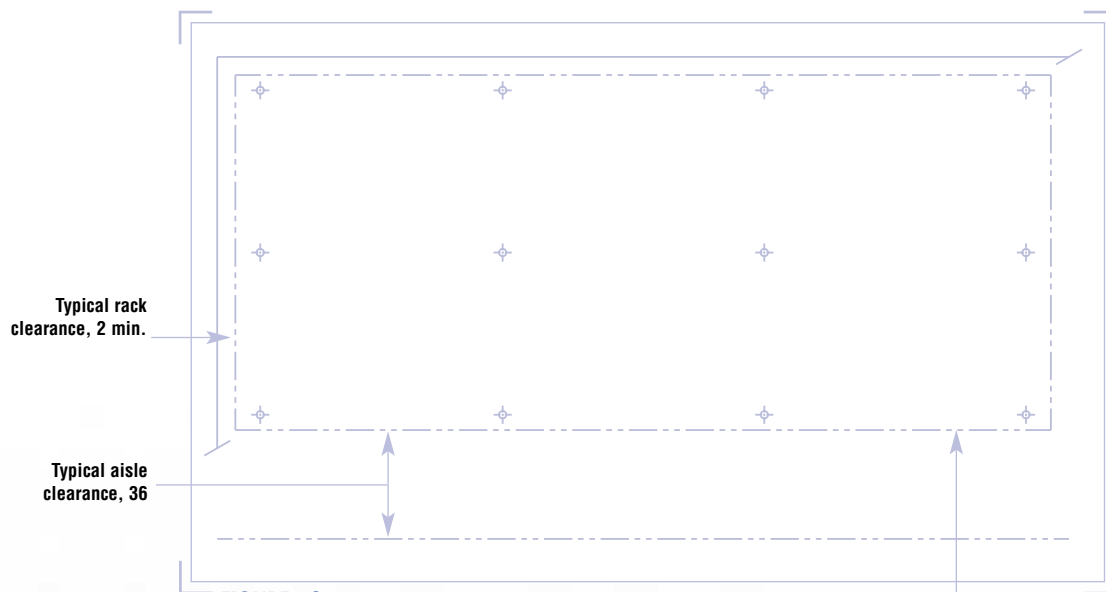


FIGURE #2 Rack Assembly Location and Anchor Bolt Pattern.

External rack dimensions.
See assembly drawings.

ASSEMBLY INSTRUCTIONS:

- 1 Initial Assembly:** Place frames over installed floor mounting hardware, finger tighten. See Figure #3. (Floor anchors are not supplied with rack) All frames must be in the proper orientation as shown on the rack assembly drawing. Install back (away from aisle) cross braces for single row rack and center braces for double row rack. See Figure #4. Please refer to rack drawing for proper orientation of cross braces. Refer to Detail #1 for brace to frame installation and Detail #3 for brace to brace connections.

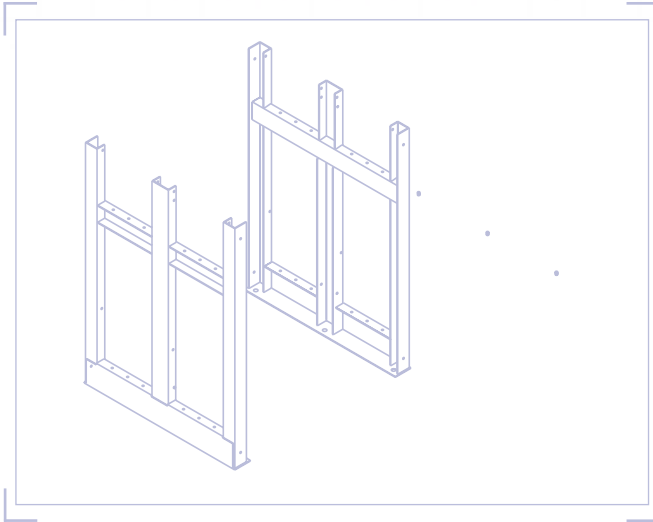


FIGURE #3 Placing Frames.

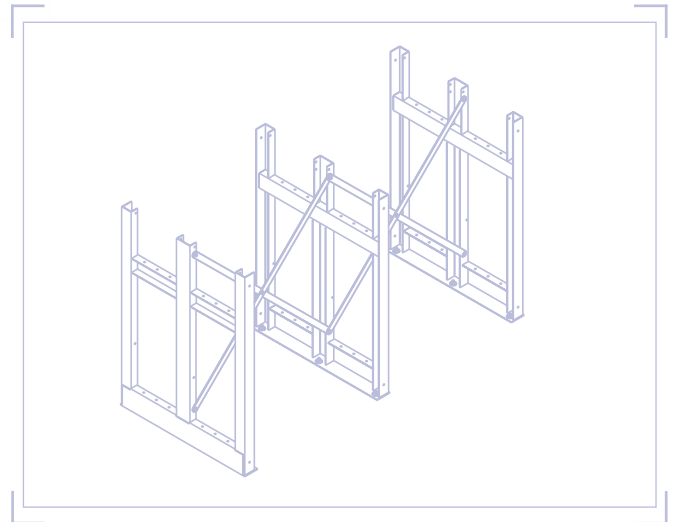


FIGURE #4 Installing Cross Braces.

Place support rail(s) in location using supplied 3/8" bolt, lock washer and serrated strut nut. Ensure that the strut nut has properly engaged the strut.

- 2 Side Rails:** Install back side restraint rail for 2-tier racks and center side rails on 2-tier/2-row racks. See Figure #5. Refer to Detail #2.
- 3 Installing Support Rails:** Install support rails from the back to front on 2-tier racks and from the center outward on 2-tier/2-row racks. See Figure #6.

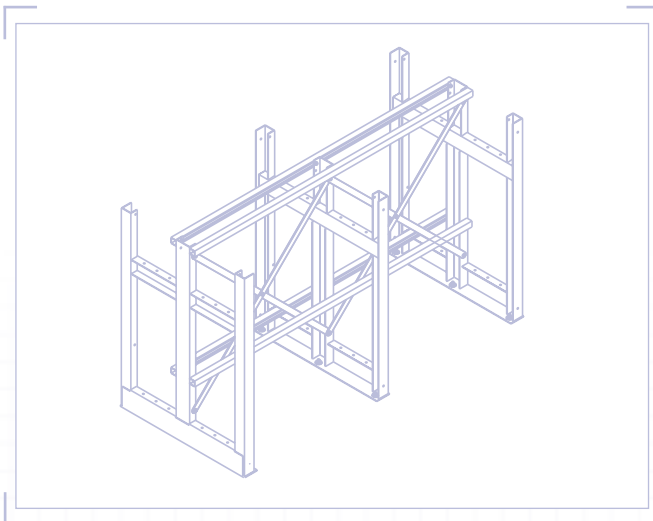


FIGURE #5 Installing Back or Center Side Restraint Rails and Covers.

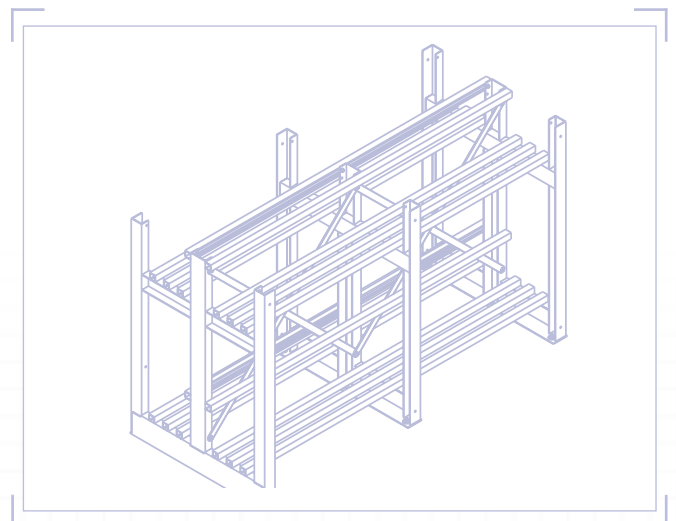


FIGURE #6 Installing Support Rails and Covers.

- 4 Leveling:** With all support rails (not all side) rails and covers in place, the rack needs to be checked for level and square. Shim frames as necessary to obtain level and squareness. Shims are not supplied by C&D. With all frames level and square, torque cross brace bolts then torque the support rail to frame bolts. Torque anchor bolts to manufacturer's recommended value.

- 5 Install Inward Bracket of Battery Restraint Brackets:** Install partially assembled battery bracket in approximate location with hardware loose, so bracket may slide into exact location at a later step in the installation. This bracket may not be required, depending on the rack drawings. See Figure #7 and Detail #4.

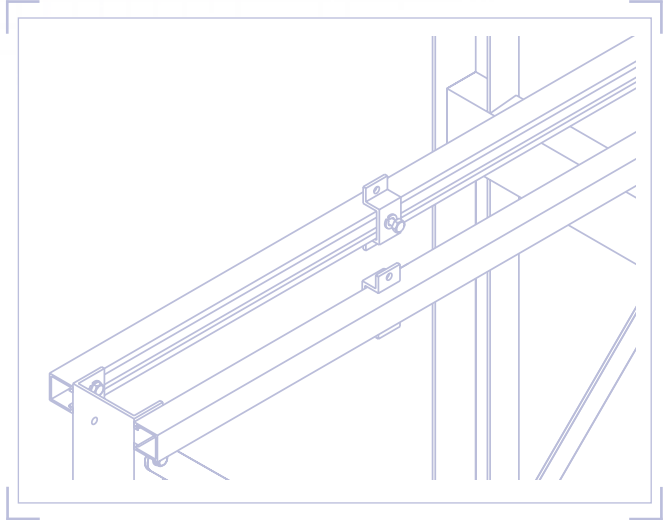


FIGURE #7 Install Bracket Top Rail.

IMPORTANT STEP:

Place front restraint rail and cover on frame cross member (top and bottom rows) to be installed after all batteries are in place. These rails should be slid up into position rather than dropped down from the top.

- 6 Cell Installation Procedure:** If not instructed otherwise, install cells starting at the center of the bottom row and working out to each end, install cell foam battery spacers as supplied if indicated by drawings.

- 7 Battery Restraint Bracket Assembly:** Install the tie rods and covers of the battery restraint bracket assembly. See Detail #4. If batteries are completely installed before this step, installing tie rods and covers will be very difficult.

- 8 Cell Installation Procedure Continued:** Do not use oil, grease or any other lubricating agent, as a lubricant for sliding batteries into place. Use a small amount of water or unscented talcum powder to help reduce friction on rail cover. Pay close attention to the polarities and terminal placement. Refer to the battery's Installation and Operating Instructions Manual for more details. All cells should be pushed back against the back restraint rail and cover. Repeat this procedure for all remaining rows and tiers. Completely finish the bottom row before starting the top row.

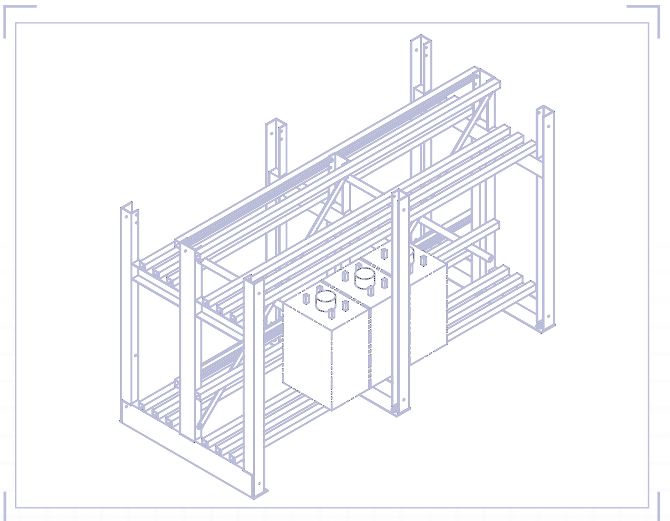


FIGURE #8 Bottom Cells Installed.

SAFETY NOTE:

Take all necessary safety precautions when installing the top row of batteries and rack components, as to not drop anything on the batteries below.

- 9 Front Restraint Rails:** With the batteries in place, slide the front side restraint rails and covers up into place. See Figure #9. There should be a maximum of 1/8" gap between side restraint rails and covers to batteries. If there is interference between battery and rail, confirm that the battery is pushed to the back for single row and towards the center for double row racks. If there is still interference, stop and contact C&D immediately. If there is a gap greater than 1/8" (3mm), contact C&D immediately.

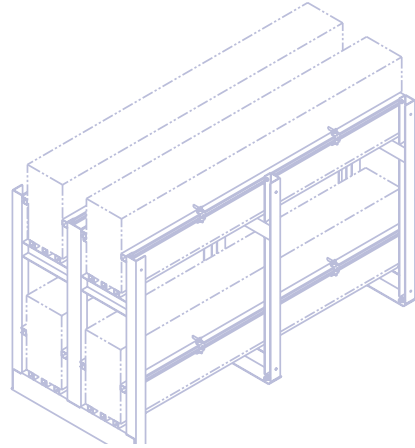


FIGURE #9 Install Front Side Restraint Rails and Covers.

- 10 Battery Restraint Bracket:** Complete the installation of battery restraint brackets, refer to Detail #4.

- 11 Install End Restraint Rails and Bracket:** Install corner brackets, end rails and covers. Position end restraint rail and cover against end of battery. See Figure #10 and Detail #5.

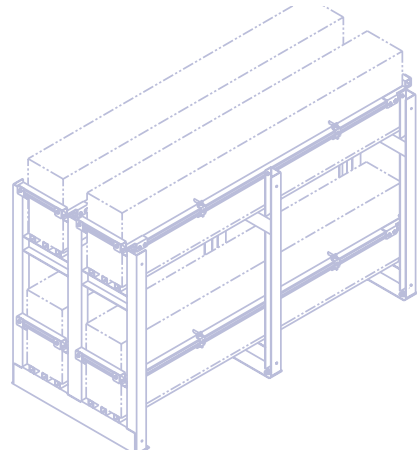


FIGURE #10 Install End Restraint Brackets, Rails and Covers.

- 12 Install Front Cross Braces:** Install front cross braces for single row rack and front & rear cross braces for double row racks. Note that the center bolt must be inserted into the brace from the battery side. If installed incorrectly the bolt may puncture the battery container during a seismic occurrence. See Figure #11 Details #1 and #3.

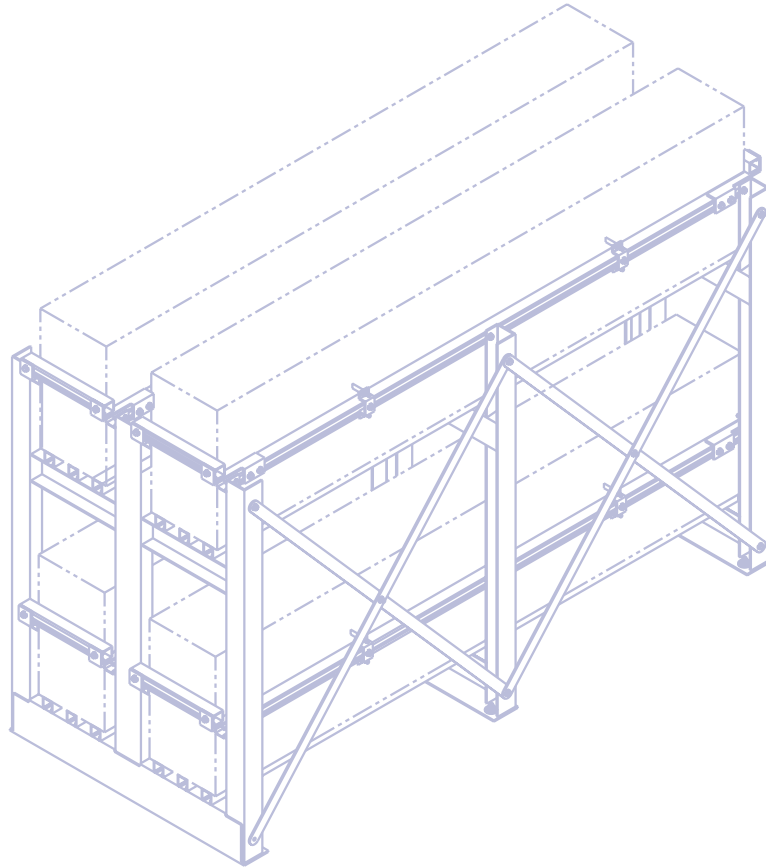


FIGURE #11 Completed Rack Assembly.

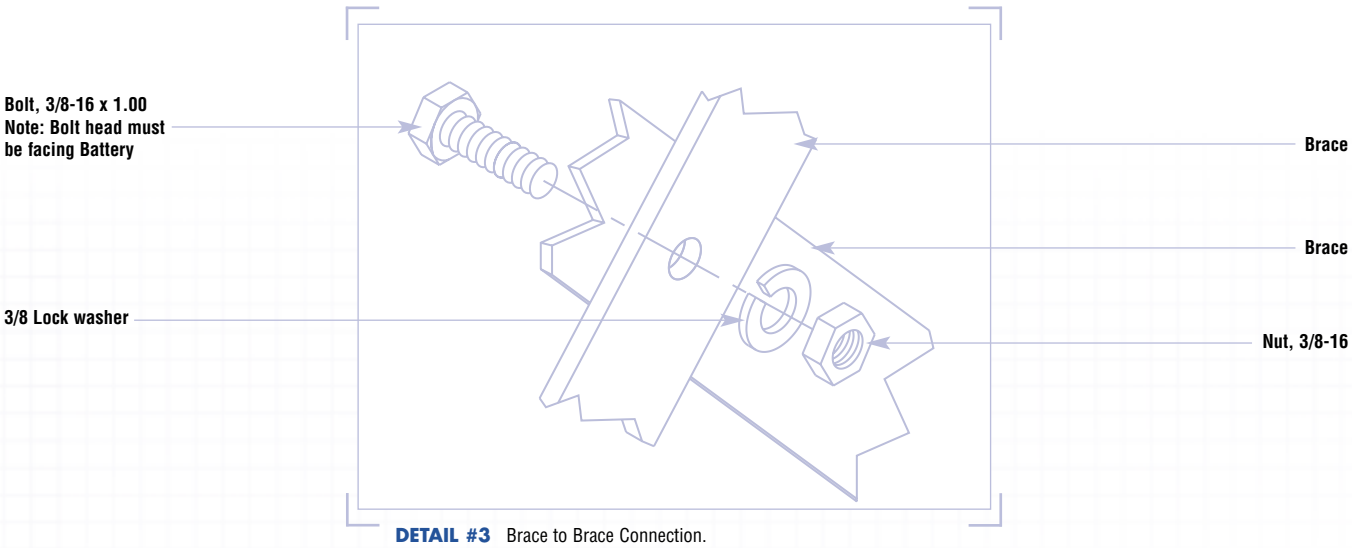
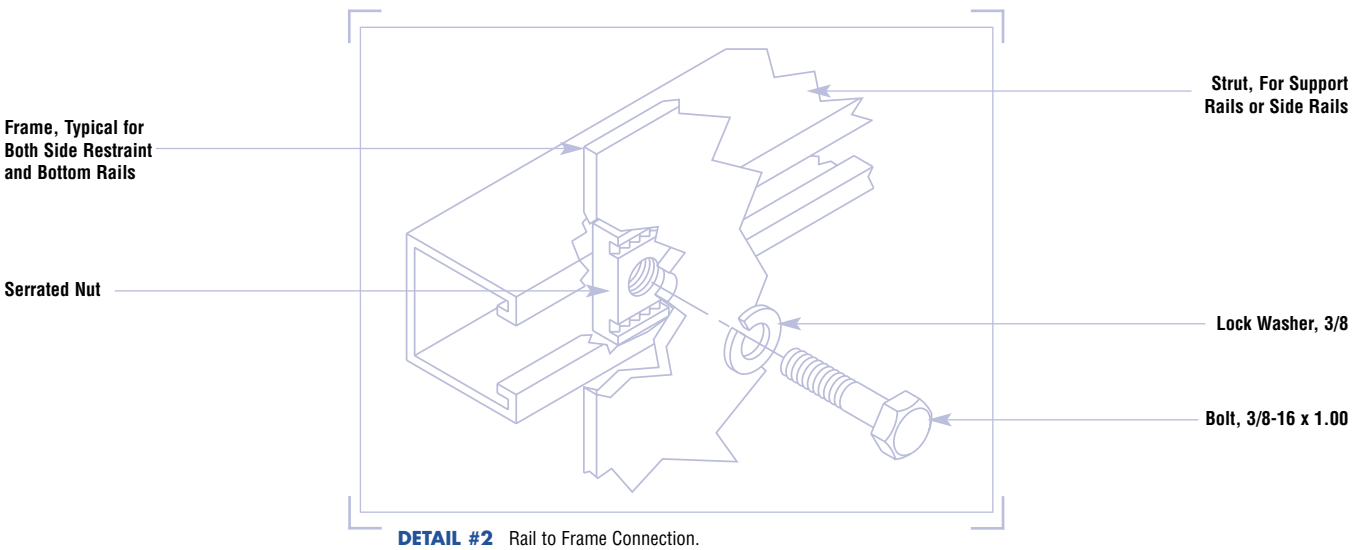
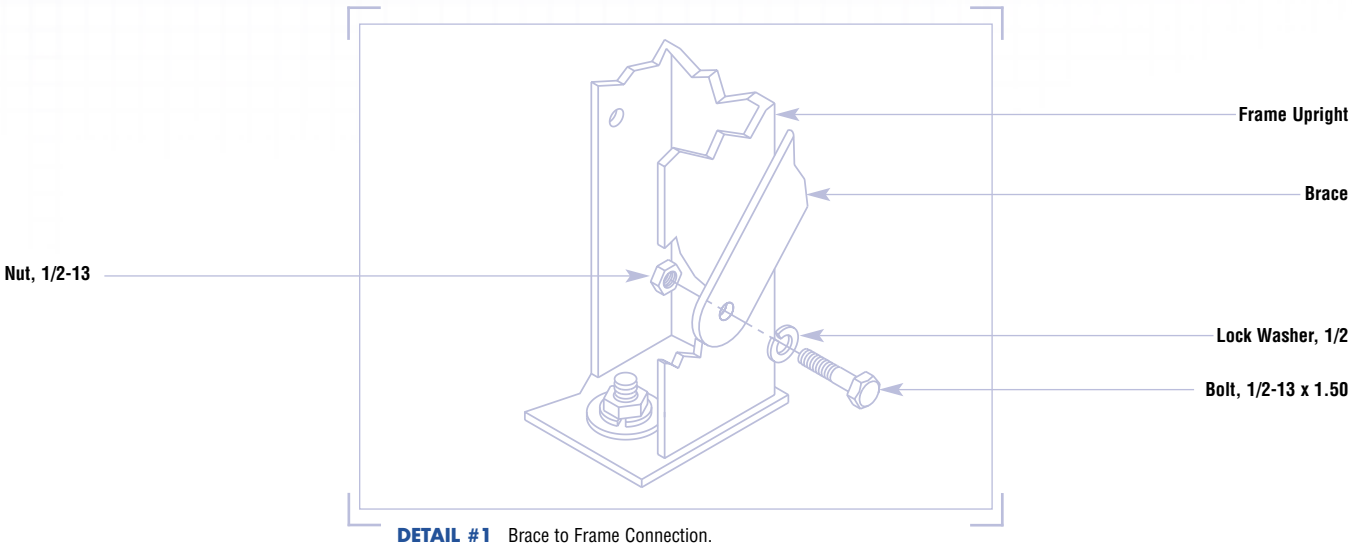
- 13 Battery Arrangement:** Install inter-cell and inter-unit connectors and cable assemblies as specified by the battery arrangement. Refer to battery installation manual for more detail on battery connections.

ADDITIONAL INSTRUCTION FOR MULTI-RACK ARRANGEMENTS

Back to Back Assembly: Single row racks which are installed in an back to back arrangement should be spaced a minimum of 2" apart.

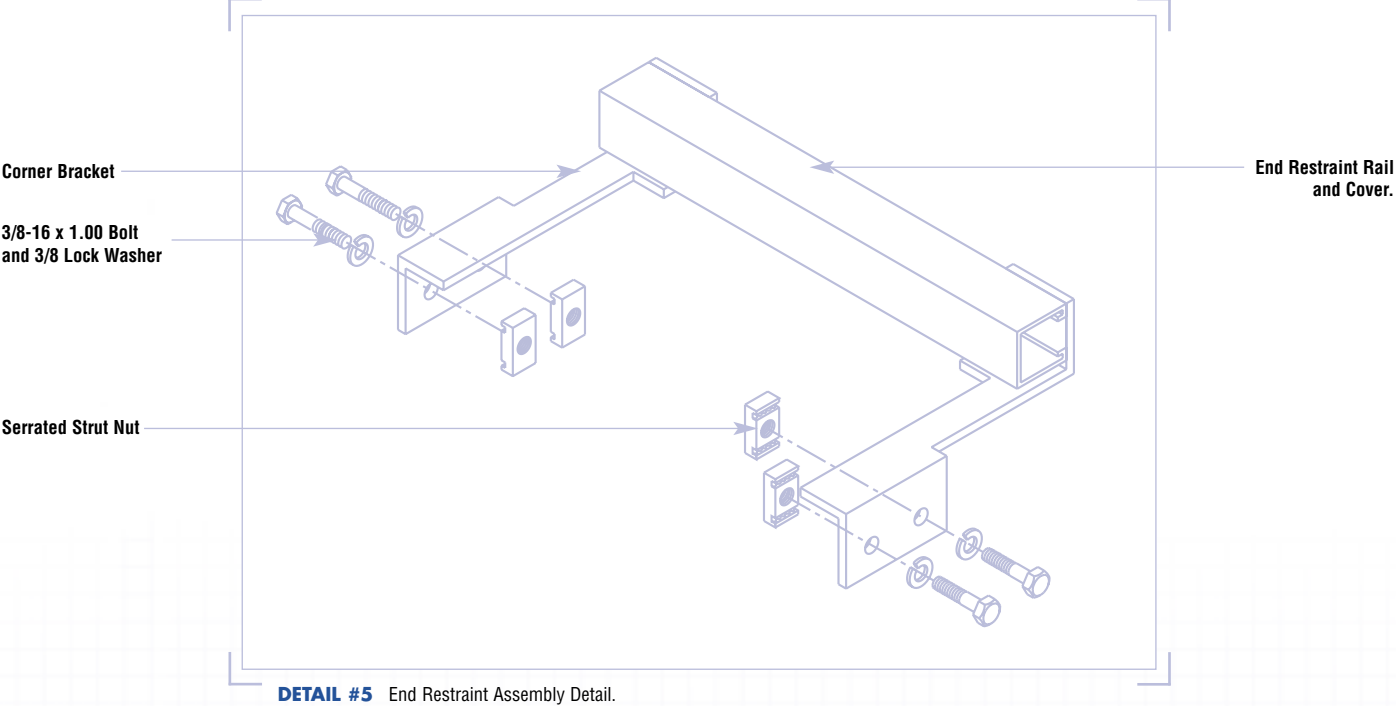
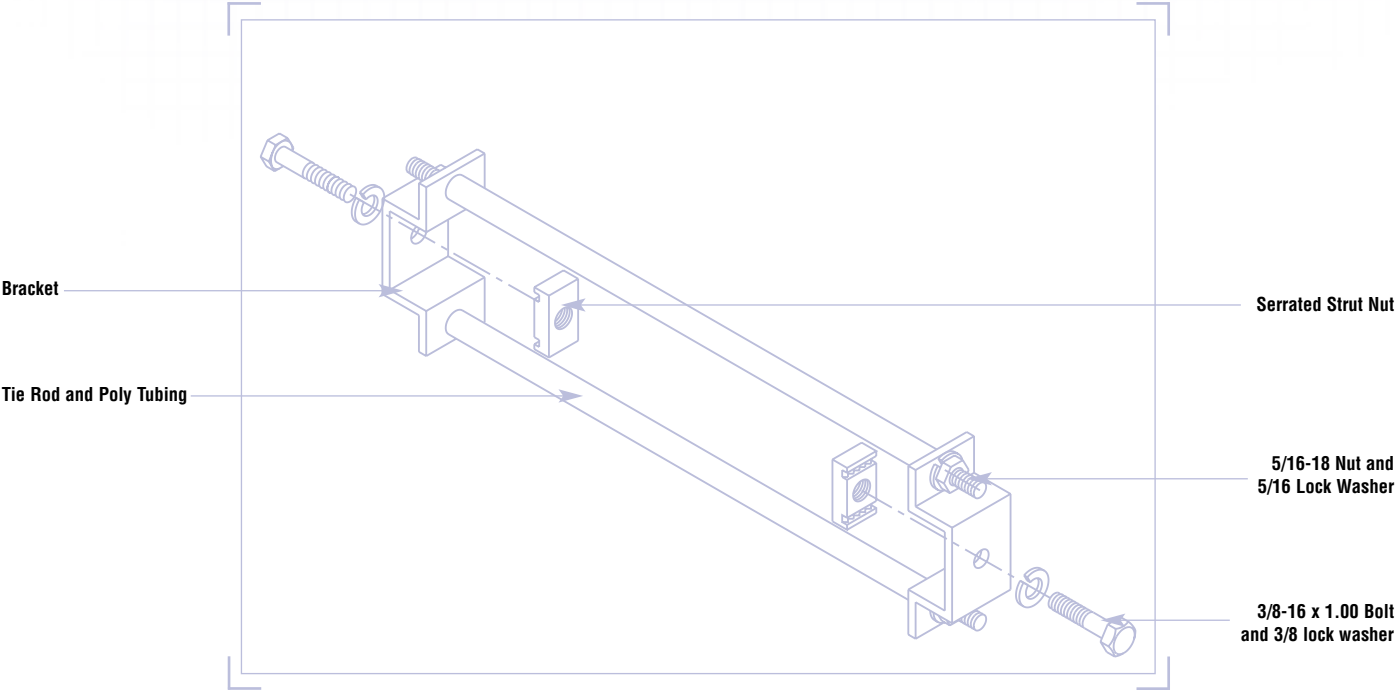
CONNECTION DETAILS FOR RACK ASSEMBLY.

Typical Bolted Connections: These typical details are to be used unless detailed specifically on drawing. Use torque values from Table #2. For all values.



CONNECTION DETAILS FOR RACK ASSEMBLY.

Typical Bolted Connections Continued: These typical details are to be used unless detailed specifically on drawing.



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