
3D STORAGE SYSTEMS LIMITED

FLOWRACK INSTALLATION GUIDE

GENERAL COMMENTS

Flowrack systems are used to store pallets of goods two or more pallets deep between aisles. Pallets are loaded into the rack from one aisle and rely on gravity to cause the pallets to flow to another aisle from which it can be unloaded. Flowtracks may use either wheels or rollers, with different spacings depending on the application.

Polycarbonate wheel flowracks generally have three runs (or sets of tracks) for deep pallet storage. Skatewheel Picking systems, two or three pallets deep, generally have two runs, and roller flowrack systems generally have one (full width), two, or three runs of roller track per lane. With the exception of Skatewheel Picking lanes, brake rollers (or speed controllers) are used to prevent the pallets from traveling at excessive speeds. Longer lanes of flowrack usually have entry guides at the load end in order to ensure that pallets are placed accurately in the centre of the tracks, since pallets placed off-center into a flowrack lane may drift further off centre to the point where a pallet could come off the track completely.

All dynamic storage systems, because the pallets move, require greater accuracy in installation than is necessary for selective, double deep, or drive-in racking systems. To ensure proper flow of pallets through the system, flowrack frames must be accurately shimmed, and tracks must be installed straight and parallel.

Beams in the rack should be installed so that the beam at the unload end is lower than the second beam which in turn is lower than the next beam etc. Designers at the rack manufacturer determine the bracket drops on beams to achieve the appropriate slope, which is normally approximately 7/16" per foot.

FLOWRACK INSTALLATION PROCEDURES

1. SHOOT THE FLOOR

Using a Transit Level or Laser Level, find the high point of the floor in the area where the racking will be installed, and mark or map the rest of the area, in order to determine what amount of shimming will be required to have all the rack frames level +/- 1/16".

2. IDENTIFY BEAMS AND TRACKS

In order to provide appropriate slope for the flowrack lanes, rack manufacturers use various weld-down or drop-on-bracket dimensions on intermediate beams. Generally, these beams are standard box beams or structural channel beams, with the exception of the weld-downs. Load and Unload beams may be angle beams with slots in the horizontal legs, structural channel beams with angle cleats, or HSS structural beams with angle cleats. If the beams are not marked, it is important to identify them, using the parts list descriptions or drawings provided by the rack manufacturer. Please note that usually there are several different frame depths and row spacer lengths. The flow track components supplied by 3D Storage Systems have labels on each track section, indicating the item and the direction of flow. The installation instructions, normally attached to the boxes of hardware, should include a map showing placement of each track section.

3. STAND FRAMES

Choose one corner of the system as the start point of the installation. Stand two frame lines using beams placed at convenient heights to hold the frames steady. Make sure that the frame lines are straight, square to the face of the rack, and properly shimmed. Install row spacers loosely, but do not tighten row spacer hardware. Anchor only one frame at the start point of the installation. If row spacers are tightened, or remaining frames are anchored, it may be difficult to install the flowtrack sections.

4. INSTALL FLOWTRACKS

Place the flowtrack sections in their correct place and orientation in one lane. Loosely fasten the tracks to the load and unload beams with the hardware provided. The splices between sections of flowtrack do not bolt to the beams in the same fashion as the load and unload beams. Instead, the ends of the track sections are designed to meet on top of the intermediate beams. Insert the U-bolts from the top down, through the slots in the bottom flanges of the flowtracks, and around the beam. Install the small strap plates over the open ends of the U-bolts, and loosely fasten with the Nyloc nuts provided. Run a taut string from the load end of the lane to the unload end in order to provide a "straight edge" close to one track, and adjust the position of the flowtrack sections until they are straight. Fasten the U-bolts at the intermediate splices and the nuts and bolts at each end

for that track. If the lane has two or three tracks per lane, repeat with the other tracks in that lane. Pallets will not flow if the tracks are not parallel.

Anchor the remaining frames in the first bay, ensuring that the frames have the appropriate shims under each post.

If the lane is designed with entry guides, install one set in the first lane. Note that there are left-hand and right-hand entry guides. They are designed to be installed at the load end of the lane, sloping slightly at the same slope as the flowtracks, They should be installed so that the narrowest point between the guides is lower than the top of the pallets. Generally, they are installed using the lowest set of holes available in the frame posts that are not already occupied by beam brackets. In order to make the Entry Guides taper outward slightly as the pallet flows down the lane, the brackets at the aisle ends should be thicker than at the other end of the guides.

5. TEST LANE

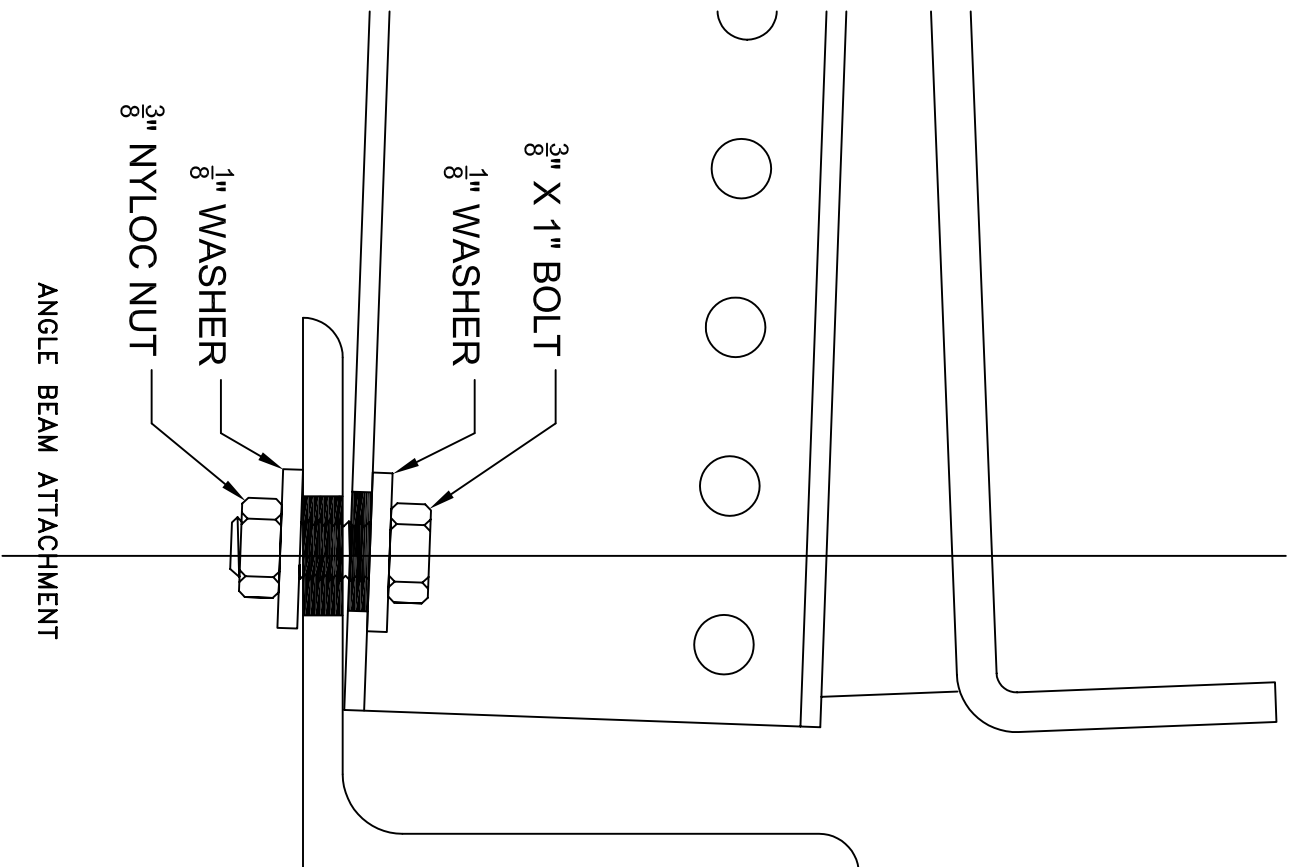
Prior to installing additional lanes, test the first lane, with pallets that the customer will be using in the system. Preferably, actual customer loads should be tested, to ensure that pallet weights, heights, etc. are the same as will be used, since such factors, if different than what the system was designed for, can result in significantly different flow characteristics.

6. INSTALL REMAINING FLOWTRACKS

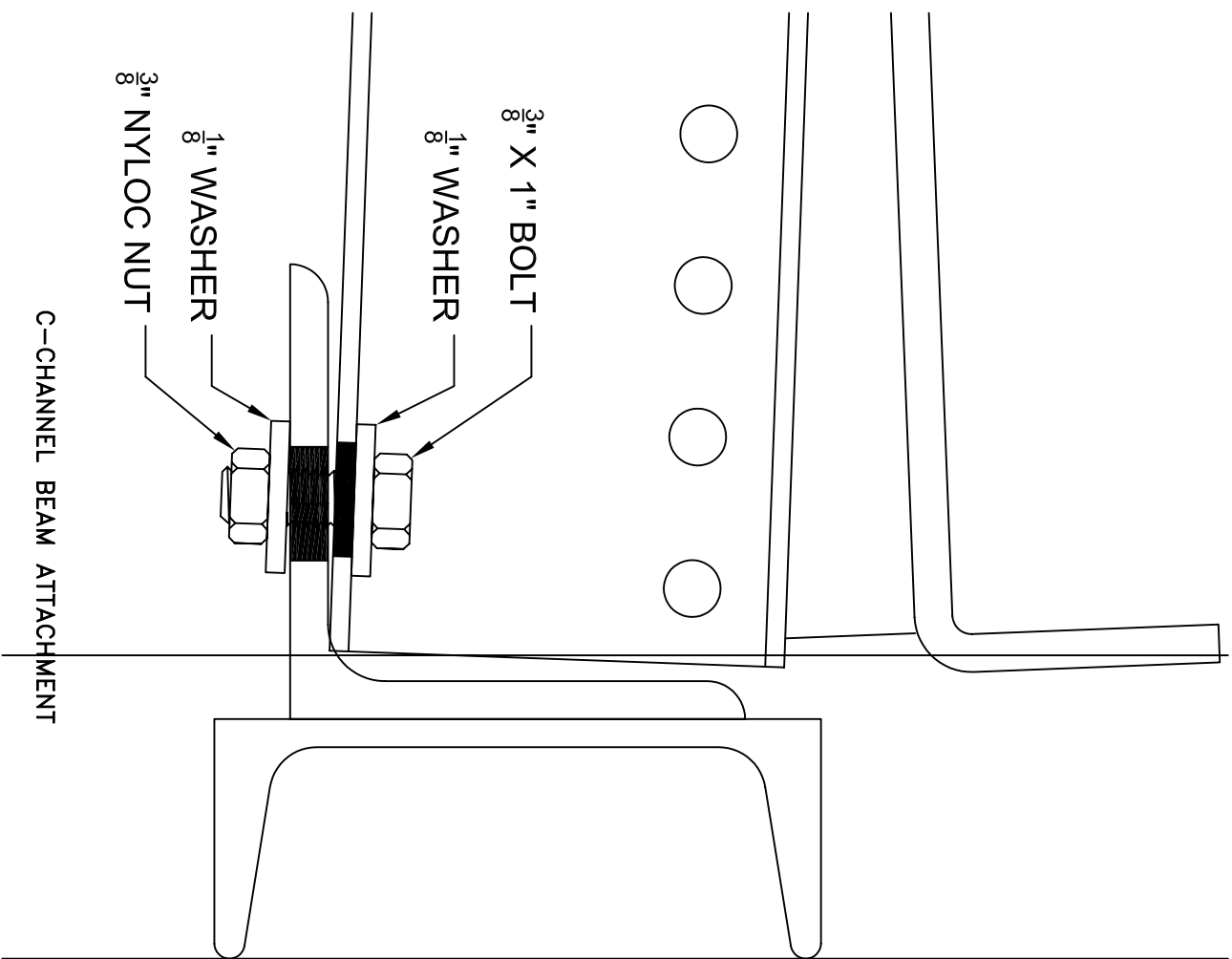
After successful completion of testing in the first lane, install remaining lanes in a similar manner. After all flowtracks have been installed and fastened down, complete the tightening of the row spacer hardware. Finally, anchor the remaining frames, again ensuring that the frames have the appropriate shimming under each post.

7. TECHNICAL ASSISTANCE

If you experience difficulty during the identification or installation of the flowtrack system, please call 3D Storage Systems for assistance at 905-830-0003. If we receive a call from an installer on site with a cellular phone, we can compare our notes drawings and measurements, in order to sort out questions or difficulties, usually with no further time delay.



ANGLE BEAM ATTACHMENT



C-CHANNEL BEAM ATTACHMENT

NOTES:
 THIS INSTALL DRAWINGS SHOW HOW THE FLOWRACK
 RAILS CONNECT TO FRONT / REAR BEAMS.

PROJECT NAME:

DEALER NAME:

DRAWING No.:

FLOWRACK ATTACHMENT

DATE:

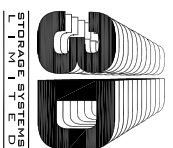
JANUARY 16, 2009

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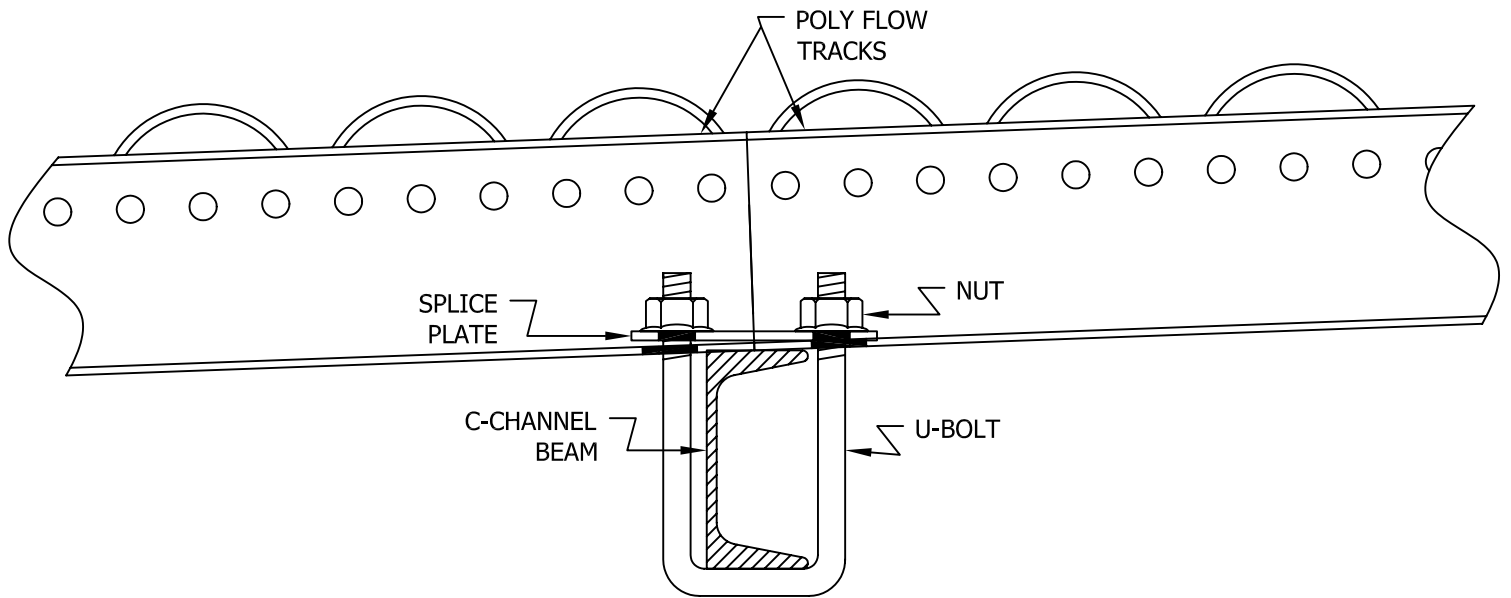
G.A.B.

SCALE:


NTS



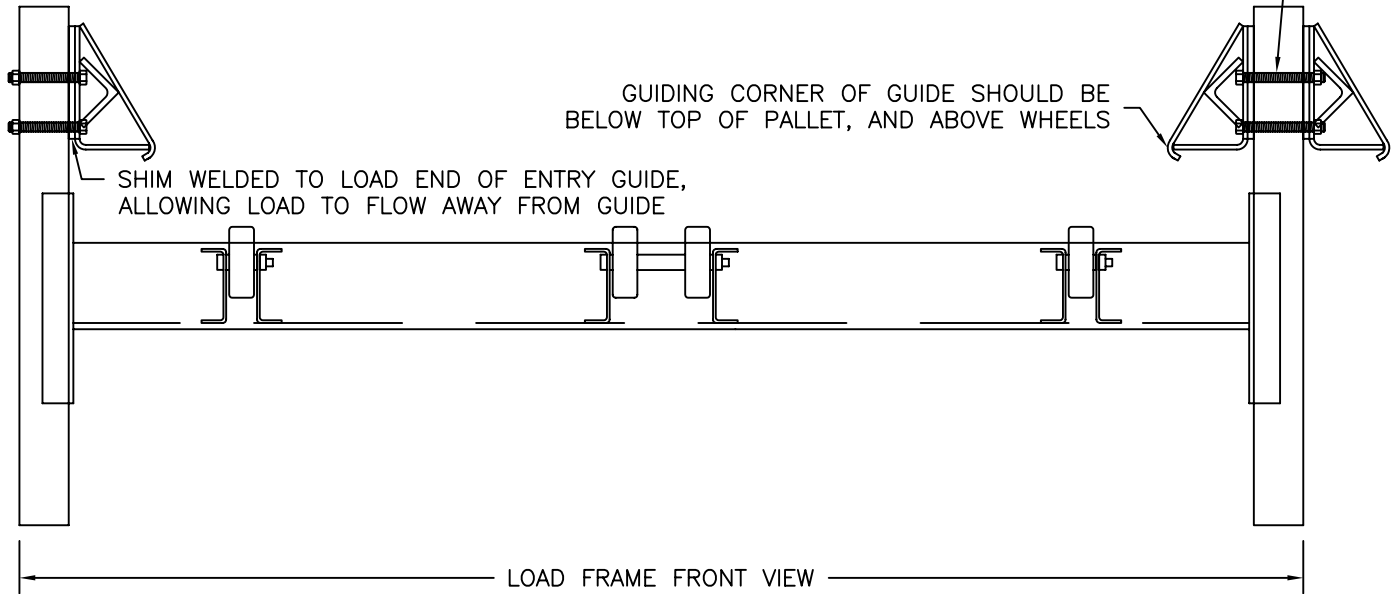
270 HARRY WALKER PARKWAY N.
 NEWMARKET, ON.
 L3Y 7B4
 TEL - (905) 830-0003
 FAX - (905) 830-0338
 THIS DRAWING IS THE PROPERTY OF
 STORAGE SYSTEMS LIMITED AND
 IS NOT TO BE REPRODUCED IN ANY
 FORM WITHOUT WRITTEN CONSENT



CHANNEL BEAM SHOWN
(SAME CONFIGURATION FOR STEP AND BOX BEAMS)

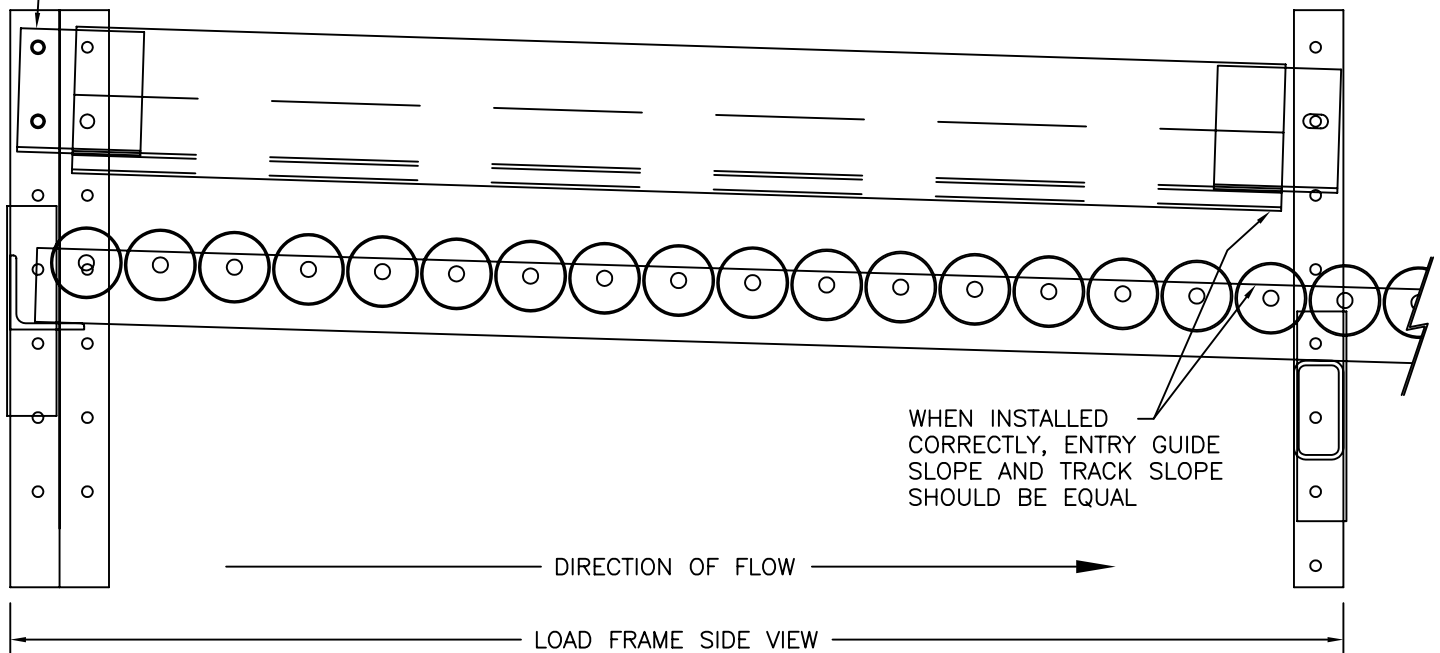
NOTES:	PROJECT NAME:	DRAWING No.:	 270 HARRY WALKER PARKWAY N. NEWMARKET, ON. L3Y 7B4 TEL - (905) 830-0003 FAX - (905) 830-0338 <small>THIS DRAWING IS THE PROPERTY OF 3D STORAGE SYSTEMS LIMITED AND IS NOT TO BE REPRODUCED IN ANY FORM WITHOUT WRITTEN CONSENT</small>
	U-BOLT INSTALLATION INSTRUCTIONS	U-BOLT INSTALL DIAGRAM	
	POLY TRACK SPLICE	DATE: JANUARY 5, 2009	
		DRAWN BY: O.N.	

USE 4 1/2" x 3/8" BOLTS,
WASHERS AND NYLOC NUTS
WHEN ATTACHING GUIDES
TO COLUMNS



LOAD FRAME FRONT VIEW

ENTRY GUIDE TO BE
INSTALLED AS LOW AS
POSSIBLE TO BRACKETS
OF LOAD END BEAM



LOAD FRAME SIDE VIEW

NOTES:
**STANDARD ENTRY GUIDE
MOUNTING INSTRUCTIONS**

PROJECT NAME:

DEALER NAME:

DRAWING No.:

A111090C

DATE:

DECEMBER 29, 2008

DRAWN BY:

G.A.B.

SCALE:

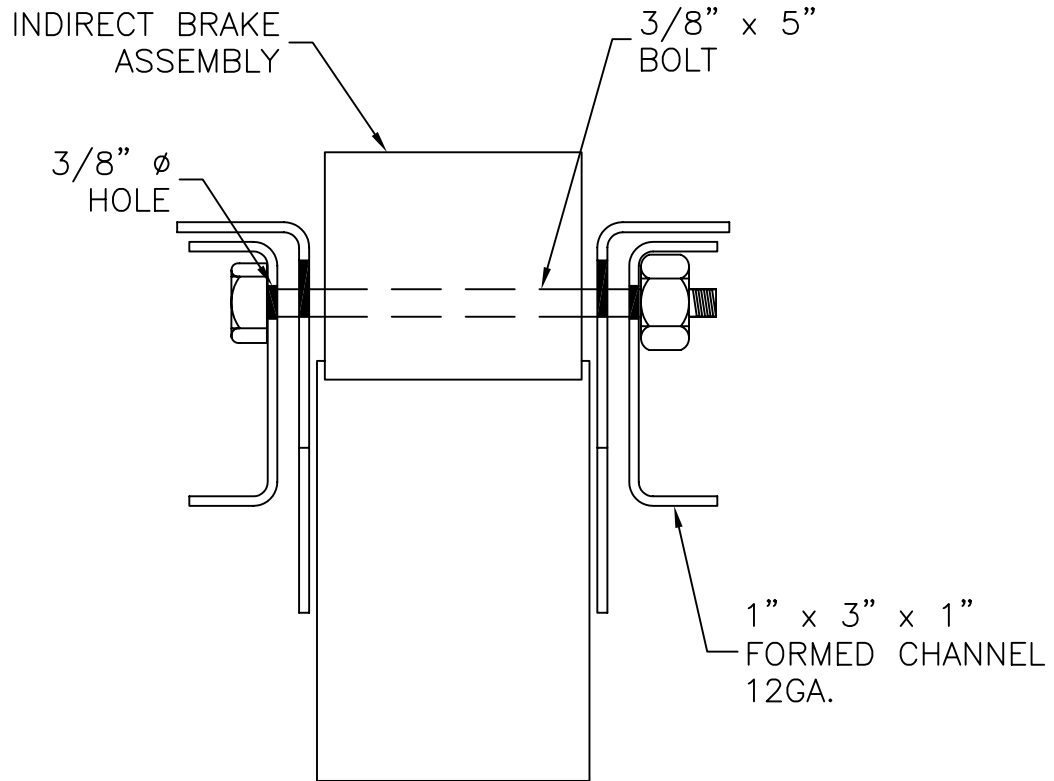
NTS



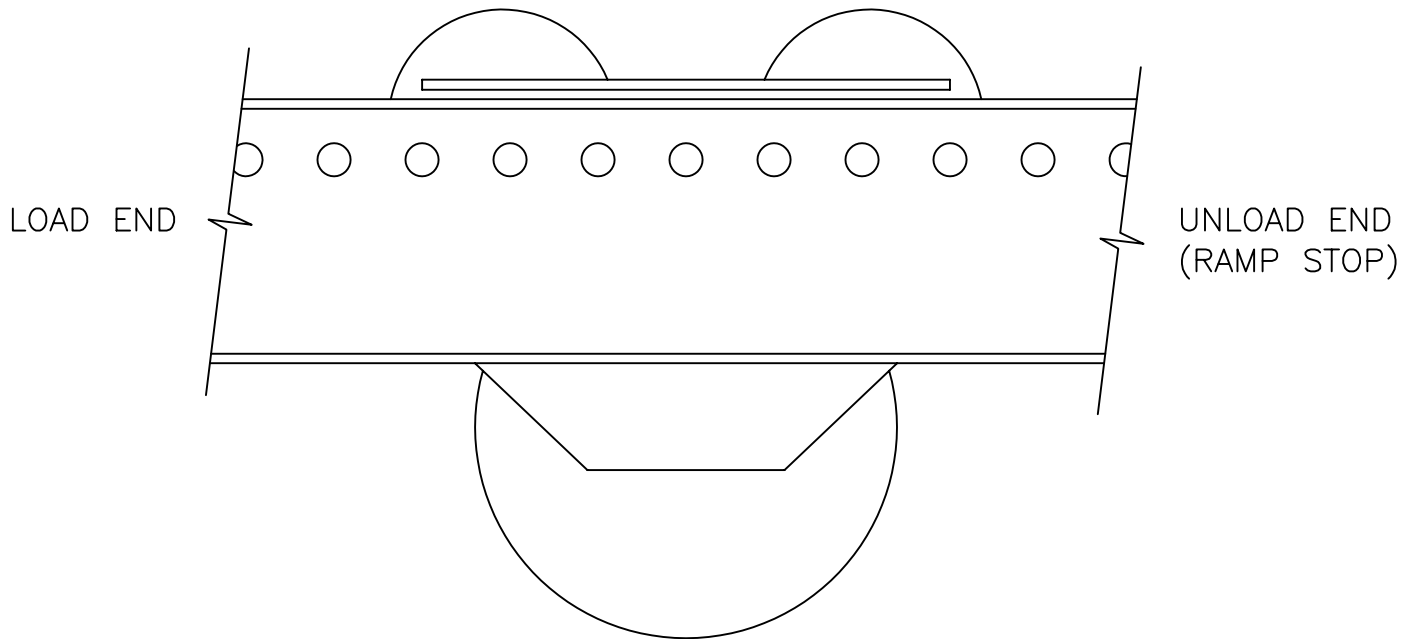
270 HARRY WALKER PARKWAY N.
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L3Y 7B4


TEL - (905) 830-0003
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DIRECTION OF FLOW ARROW →



NOTES: INDIRECT BRAKE ASSEMBLY	PROJECT NAME:	DRAWING No.:	 <p>270 HARRY WALKER PARKWAY N. NEWMARKET, ON. L3Y 7B4 TEL - (905) 830-0003 FAX - (905) 830-0338 <small>THIS DRAWING IS THE PROPERTY OF 3D STORAGE SYSTEMS LIMITED AND IS NOT TO BE REPRODUCED IN ANY FORM WITHOUT WRITTEN CONSENT</small></p>
		A012300P	
	DEALER NAME:	DATE:	
		DECEMBER 29, 2008	
	DRAWN BY:	SCALE:	
	G.A.B.	NTS	

3D STORAGE SYSTEMS LIMITED

OPERATING INSTRUCTIONS

FLOWRACK SYSTEM

GENERAL COMMENTS

Flowrack Systems are used to store pallets of goods two or more pallets deep between aisles. Pallets are loaded into the rack from one aisle and rely of gravity to cause the pallets to flow to another aisle from which it can be unloaded. Flowracks may use either wheels or rollers with different spacings depending on the application.

Polycarbonate wheel flowrack generally have three runs (or sets of tracks) for deep pallet storage. Skatewheel picking systems, two or three deep generally have two runs and roller flowrack systems generally have one (full width), two or three runs of roller track per lane. With the exception of skatewheel picking lanes, brake rollers (or speed controllers) are used to prevent the pallets from traveling at excessive speeds. Longer lanes of flowrack usually have entry guides at the load end in order to ensure that pallets are placed accurately in the center of the tracks, since pallets placed off-center could come off the track completely. All dynamic storage systems require accuracy in loading, with flowrack the accuracy becomes more of a factor the deeper the pallet has to travel to be unloaded.

FLOWRACK OPERATING PROCEEDURES

- 1) Pallets must be loaded and unloaded with the forklift squared up to the face of the rack, and with the pallet centered relative to the flowrack lane.
Do not approach or withdraw at an angle
- 2) When loading a pallet, make sure the pallet is 4 to 6 inches above the top of the wheels or rollers. This is especially important if the lane is outfitted with entry guides, since damage to the pallets or loads could occur if the pallet hits the end of the guide.
- 3) Lower the pallet onto the wheels or rollers in a controlled, fairly gentle manner. Lowering the pallet at a maximum rate that the hydraulic system on the lift truck allows can result in damage to wheels or rollers. Pallets will not flow over bent rollers or “flattened” wheels.
- 4) When loading a pallet it may be necessary to give the pallet a small push with the forklift, especially if the pallet is pressing against the side of an entry guide. Entry guides are designed to be approximately one inch wider than the widest pallet for which the system was designed. Even pallets that are leaning against the side of a guide will not normally require more than a gentle assist to start flowing, unless the pallet is wider than the system was designed to handle.

- 5) Check the underside of pallets before loading into a flowrack lane. Broken or missing bottom boards can result in pallets failing to resume flowing when pallets are unloaded from the system. In certain cases, missing boards or nail heads protruding from bottom boards can result in serious damage to the flowrack components. Stretch wrap hanging below the pallet can become entangled in the wheels and prevent the proper flow of pallets.
- 6) When removing pallets from the lane, lift the pallet to a level position just high enough to clear the front beam. ***Withdraw at a slow constant speed***
- 7) When unloading a pallet, it may be necessary to give the remaining pallets in the lane a gentle “bump”, in order to help the remaining pallets start moving toward the unload end of the lane. This should be done by lifting the pallet two or three inches off the flowrack, then driving forward approximately two inches, then backing out at a normal, controlled speed. The requirement for bumping will depend on factors, such as the number and width of the bottom boards, the material that the bottom boards are made of, the weight of the load, the number of pallets loaded in the system, the amount of time that the pallets have been in the system without moving, and the temperature of the warehouse, etcetera. In optimum conditions, such as GMA or CHEP pallets, with load weights of 1,000 to 2,000 pounds, this bumping is rarely required.

IF YOU HAVE A PROBLEM

- 1) Make sure that the following pallets come to the front of the system. If for some reason that pallets do not roll forward during unloading, even after “bumping”, push the pallet back in and back out again. If the pallets still do not then flow to the unload end, it may be necessary to put pallets in the load end in order to push the problem pallet to the unload position.
- 2) If you have removed a problem pallet from the system, try to determine the cause of the hang-up, in order to attempt to prevent similar problems in the future. If no apparent reason is readily visible, make note of the lane location, so that if subsequent problems occur in the same lane, the lane can be checked for damaged wheels, rollers, brake rollers, etcetera.
- 3) On occasion, it may be necessary to enter a flowrack lane that still has loads hung up in their interior of the rack system. For example, if a leaning load, or off-center load gets caught behind an upright frame post, it will be necessary to partially unload the pallet before it can flow to the unload end. If it is necessary to go into the interior of a flowrack lane in these conditions, a lane next to the offending lane should be emptied, so that there is a safe escape route when the pallet starts to move. The problem pallet should be blocked prior to attempting to rectify the problem, so that the individuals working at the pallet can control when the pallet is able to resume its travel.

A LIST OF “DON'TS”

- 1) Do not side shift a load without lifting it off the flowrack, since this will usually result in damage to wheels, rollers or brakes.
- 2) Do not load pallets into a system that are in excess of the weight that the system was designed to handle. Brake rollers are designed to operate in a reasonably narrow weight range, and excess weight can result in damage to the system or to the product, or it can result in serious injury or death if the pallet falls out of the unload end of the system.
- 3) Never load a pallet into a lane that has been identified as having significant damage to wheels, rollers, or brakes. Isolate and clearly mark the lane in such a manner that all operators can easily see that the lane should not be used until proper mechanical problems can be repaired.

TECHINCAL ASSISTANCE

If you have questions regarding the proper operation of the flowrack system, or in identifying possible problems, please call Mike Scott at 3D Storage Systems for assistance at 905-830-0003. Under most circumstances, we can help with suggestions after asking some questions regarding observed symptoms, usually with no further time delay.