

# Vertical Storing Dock Leveler Application Information and Design Guide



**Purpose of this document:** The purpose of this document is to provide information regarding the application requirements and benefits of vertical storing dock levelers and to facilitate optimal installation and performance of vertical storing dock levelers. Vertical storing dock levelers are a commonly used loading dock device. They offer substantially different features and benefits from conventional pit type levelers. Based on the significantly different installation arrangements they require it is important to apply and install vertical storing dock levelers properly. The installation guidelines, parameters and requirements for these dock levelers are quite different than for conventional pit style dock levelers. Failure to fully consider and apply the required application parameters for vertical storing dock levelers can result in very substantial issues and problems that will be difficult and costly to address after the fact. It can also result in significant safety issues.

**Definition:** A dock leveler that stores with the deck and lip assemblies in a vertical orientation. The leveler lowers through a rotational motion to meet the truck trailer bed for unloading. This differs from conventional pit levelers which store with the deck in the horizontal position.



# Benefits and reasons for utilizing vertical storing dock levelers:

## **Energy efficiency and improved environmental control:**

As the dock leveler stores vertically inside the building, it allows the overhead door to be closed tightly against the pit floor and against the pit wall sides. This creates an improved sealing of the loading dock. It eliminates the gaps that exist around pit style dock levelers. Reduced exchange of outside air with the conditioned air in the facility results in improved control of the facilities interior environment and in reduced energy loss.

## **Improved rodent, vermin control, reduced dirt and debris entry:**

As the dock leveler stores vertically inside the building, it allows the overhead door to be closed tightly against the pit floor and against the pit wall sides. This creates an improved sealing of the loading dock which reduces or eliminates rodent and vermin entry. It also reduces the infiltration of dirt and debris into the facility.

**Facilitates easier cleaning and maintenance:** Access for cleaning is greatly improved given the vertical orientation of the deck and lip assemblies. This is a significant benefit for industries and businesses in which cleanliness and sanitation at the loading dock is important. Food processing operations are a good example of where the benefits of vertical storing dock levelers can be utilized. The ledge or continuous pit type of installations often further enhance the ease and speed of cleaning. (See the pit types section of this document for more information).

**Protects the overhead door from the damage due to forklift impacts:** The vertical orientation of the dock leveler in front of the overhead door acts to protect the door from impacts from forklifts that move in and around the loading dock.

**Acts as barrier for fork lifts to prevent falls from the loading dock:** The vertically stored dock leveler acts as a barrier to fork lifts moving in and around the loading dock, restricting the fork lift driver from inadvertently driving off the dock through an open door. The vertical storing dock leveler provides a visual and physical barrier to fork lift drivers.

**Can facilitate the opening of a truck doors after the truck has been parked at the loading dock:** When design consideration is given in advance and the proper design parameters applied it is possible to configure a loading dock in which the transport truck trailer can leave its doors closed until the truck has been parked against the bumpers of the loading dock. This configuration results in increased security of the truck cargo and protects the truck cargo from being exposed to the outside elements as the doors of the truck are not opened until the truck is parked against the building. This benefit is further enhanced and complimented by the application of an inflatable dock shelter.



# What are the applications for vertical storing dock levelers?

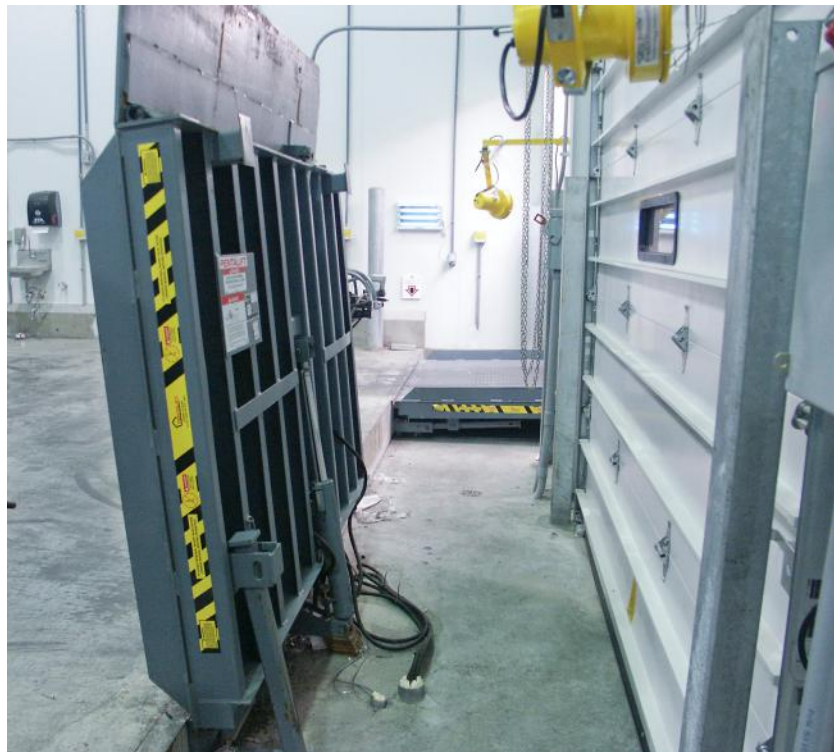
Based on the superior performance provided by vertical storing dock levelers in energy savings, cleanliness, sanitation, and safety they are utilized in applications such as food and pharmaceutical. They offer value in any application where these characteristics are desired at a superior level.

## Considerations for vertical storing dock levelers relative to pit installed dock levelers:

**Initial purchase & installation costs are higher:** The design parameters and additional safety requirements of vertical storing dock levelers make them more expensive than the same size and capacity conventional pit style hydraulic dock levelers. Installation is generally more expensive as well based on the different pit configuration and the additional installation steps and requirements.

**Controls and operation are different:** As this leveler is completely different in its operation and function there is a learning curve for new users.

**Application and installation requirements are quite different from pit levelers:** These levelers require completely different application and installation considerations and processes than conventional pit installed levelers. Sales representatives, architects, contractors, users as well as installation and service technicians that are knowledgeable and well versed in the application and installation of conventional pit levelers require a different set of information, knowledge and tools to properly apply and install vertical storing dock levelers. This concern is best addressed by detailed consultation with Pentlift and reference and use of the manufacturer's application and installation information. This would include but not be limited to application guides (such as this document), the use of survey and selection sheets and following the detailed installation and use instructions provided in the owner's manual. Applying the appropriate design, construction, installation and use criteria the first time, results in a successful installation that benefits all involved in the project and alleviates unwanted issues and additional / unexpected costs.



## Design considerations:

Once the decision has been made to install vertical storing dock levelers then the following considerations should take place.

### Vertical Storing dock leveler pit style:

There are two main types of pit styles for vertical storing dock levelers.



#### Continuous pit / ledge construction

In this arrangement the dock levelers are installed on a ledge or step that is built at the loading dock. There are a number of benefits to this arrangement. The continuous arrangement of the pit facilitates easier cleaning by allowing brooms and even smaller powered sweepers to drive down the ledge. This arrangement is also part of the arrangement that facilitates trucks being able to back into the dock and then open the truck doors to the inside of the building. Construction costs can be cheaper with this arrangement.



#### Individual pit construction

A preformed 3 sided pit is utilized. Although the physical sizing is different, this pit appears similar to the pits used for standard pit type levelers. One of the benefits of this arrangement is that it makes the floor area between the docks available for storage and access adjacent to the dock and door at the same level as the loading dock floor.

### Dock leveler deck length:

Vertical storing dock levelers are generally provided in two different lengths 6ft and 8ft long. These lengths are nominal dimensions. The length of the dock leveler for any given application should be considered relative to the following factors:

#### Height difference between the loading dock floor and the truck bed heights to be serviced:

As the difference between these two dimensions increases (either above or below level) the move to a longer dock leveler makes more sense. The longer deck length provides a reduced inclined or declined angle of the deck assembly during loading / unloading.

#### The type of lift truck being used to load or unload the truck.

Some lift trucks such as propane power fork lifts are more suitable for handling steeper inclines or declines than others. For example a battery powered pallet truck doesn't have the same ability to overcome increased inclined or decline dock leveler decks that a propane powered fork lift does. Use of hand carts or pallet jacks for unloading can often dictate that a longer dock leveler deck is appropriate.

#### A 6ft long vertical dock leveler is the most common length and is generally suitable in most applications.

In most cases by properly planning the dock heights relative to the truck heights to be serviced a 6ft long vertical dock leveler will be satisfactory. A 6ft long vertical dock leveler provides the additional benefit of taking up less floor space in the interior of the building and is more cost effective.

**Dock leveler Deck Width:** Vertical storing dock levelers are available in 6, 6.5, and 7ft width. The widths are nominal dimensions. Consideration on the width of docks is dependent on the width of the trailers to be serviced and the physical characteristics of the product to be unloaded. With the move to wider trailers and larger loading units, the 7 ft dock width has become more popular. It provides the highest level of loading versatility.

**Dock leveler Lip Length:** The standard lip length is 16 inches. 18" and 20" lips are commonly utilized and recommended on vertical storing dock levelers to reach further into the truck bed to overcome larger steps on the back of cooler or freezer trucks.

**Dock leveler Capacity:** Capacity is one of the most critical specifications to determine when selecting the dock leveler to use in a loading dock installation. The capacity indicated on the serial number plate or on a quotation refers to the static rating or the amount of weight that can be evenly distributed across the deck of a dock leveler in the stored position.

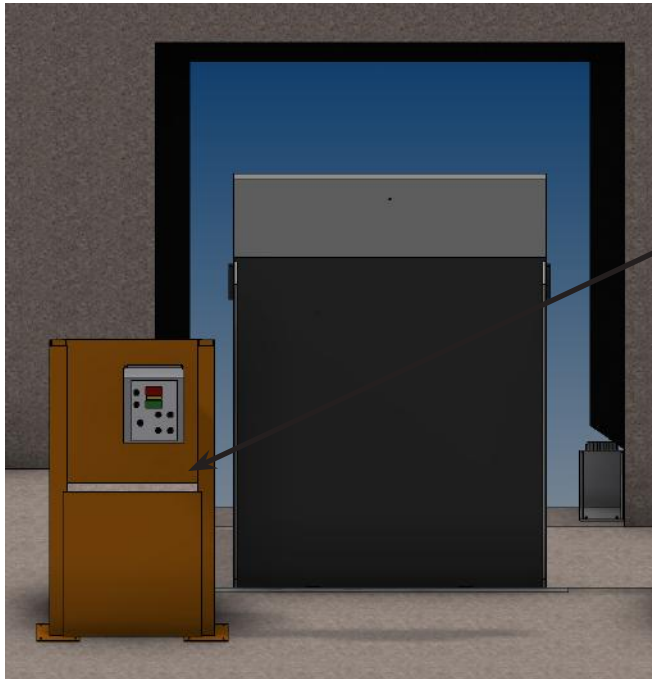
It is extremely important to consider and properly calculate the appropriate capacity of a dock leveler needed for a specific application(s). Improper capacity selection can lead to many unwanted issues ranging from the dishing of the dock leveler deck plate, to serious structural failure, which can lead to personal injury or death. The importance between static and dynamic capacity is frequently misunderstood. When determining the appropriate dock leveler capacity, it is extremely important to become knowledgeable in capacity calculations or utilize the design templates and guidelines provided by the dock leveler manufacturer. Additionally, dock leveler manufacturers will make design recommendations, including the recommended capacity. To provide the recommendations the manufacturer will require specific information on the application. The information requested may seem substantive and unimportant however complete information is vital to properly determine and provide appropriate recommendations. For more information regarding the important subject of dock leveler capacity refer to Pentalift's webpage, <http://www.pentalift.com/loading-docks/capacity.php>

## Common Options for Vertical Storing Dock Levelers:

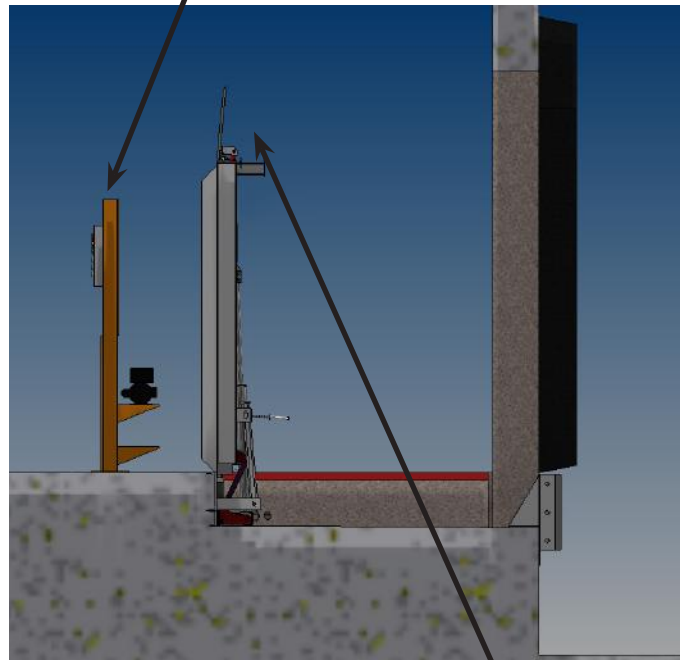
**Common Control Panel and interlocking to Overhead Door and Vehicle Restraint;** A common control panel to operate the vertical storing dock leveler, the vehicle restraint, and the overhead door is provided. Additionally the products are interlocked to improve functionality and safety.



## Common Options for Vertical Storing Dock Levelers (continued):



**Control Panel and Hydraulic Power unit Stanchion.:** A metal stanchion is installed adjacent to the vertical storing dock leveler. The control panel and hydraulic power unit are installed on the stanchion.



**Extended lip lengths:** As indicated above 18” and 20” lengths are available to increase the reach of the lip across and into the truck. Based on the nature of trucks that the typical vertical storing dock leveler services, the longer lips are generally required or a benefit.



**Folding Curtain Draft Seal:** The Pentlift folding curtain seal results in energy savings by reducing the exchange of air between the inside and outside of the facility. The fold allows the seal to continue to function as the dock leveler raises and lowers to meet with the trailer bed. Air exchange between outside air and interior air is minimized

**Spray Foam Insulation on Deck Assembly:** Spray foam is attached to the underside of the deck assembly. The foam reduces or eliminates the formation of condensation on the top side of the deck assembly in environments where there is great temperature difference between outside and inside the building this option is generally required or a benefit.



**Hot dip galvanized finish:** Maximum corrosion protection. For applications in corrosive environments and / or with frequent wash down requirements hot dip galvanizing is the ultimate surface finish. The hot galvanized liquid flows onto and protects all surfaces of the components that are dipped creating a coating for the equipment that is far superior to sprayed on coatings See Pentalift web page for more information regarding hot dip galvanizing. This option is particularly beneficial and common in food processing facilities. <http://www.pentalift.com/loading-docks/hot-dip-galvanizing.php>



**Considerations for Dock Seals and Shelters to be installed with Vertical Storing Dock Levelers:**

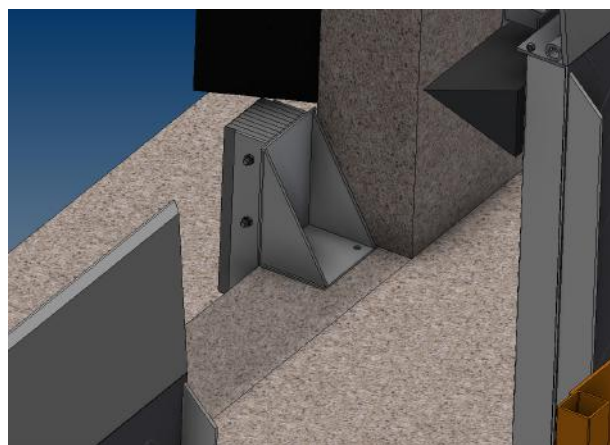
In typical applications a dock shelter is utilized in installations with vertical storing dock levelers. The dock shelter seals the truck from the side and top. This ensures that the seal does not intrude into the truck door opening which could result in damage to the seal as well as block the truck doors from opening into the building. The recommended Shelter is the PSI450, inflatable truck shelter. PSI 550 Inflatable shelter and PS400 rigid shelter are also good choices. The image at the side reflects a PSI550 Inflatable Dock Shelter.



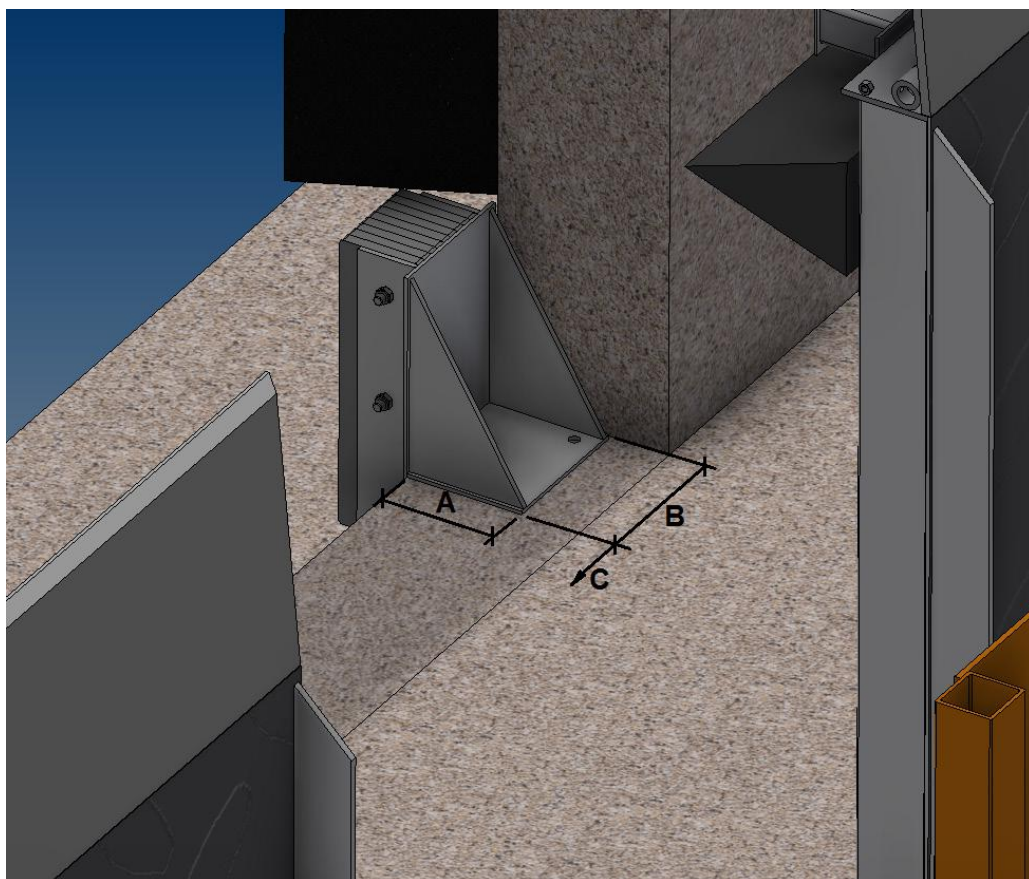
**Dock bumper considerations for Vertical Storing Dock Levelers:** There are very particular requirements for dock bumper configurations with vertical storing dock levelers. Based on the way the overhead door opening meets with the pit floor the dock bumper typically has to be supplied with a riser that is custom built or confirmed to fit the specific application's dimensions. The best way to accommodate the correct bumper application and fit is to complete the Pentlift Vertical Storing dock leveler selection guide. The illustrations below show a typical dock bumper installation for a vertical storing dock leveler. In this example the bumper riser is standard and doesn't require customizing for the application.



Dock Bumpers on Risers



Dock Bumper on Riser  
view from inside



**Dock bumper and Riser dimensional guide line:**

DIM A - The bumper riser horizontal span. Note: Normally 10 inches.

DIM B - The bumper riser width. Note: Normally 10 inches.

DIM C - The distance from the edge of the bumper riser to the side edge of the dock leveler. Note: DIM C shall be 3 inches or more as a minimum.

## **Information relative to the installation of vertical storing dock levelers:**

The two main installation choices continuous or individual pits have been described earlier in this document. In either installation arrangement the dock leveler is attached to a large structural channel assembly at the rear of the dock leveler pit or ledge. The attachment to the channel can be one of two methods:

**Drop in style:** In this arrangement the channel assembly is prefabricated at the factory. It is sent in advance of the concrete pour around the pit. It is cast into the concrete structure of the building. When the vertical storing dock leveler arrives it is dropped into this channel assembly and bolts are utilized to attach the dock leveler and the cylinder to the channel assembly. This is the recommended installation arrangement as it eliminates or minimizes field welding and speeds up installation times. Compared to the weld in place flat bar this installation method is much less onerous. As the forces on the channel assembly are substantive it is important that the connection to the channel assembly be substantively and sufficiently strong. As this installation method relies on the channel assembly to be cast into the concrete it is generally more suited to and utilized on new construction projects. The reduced welding also eliminates the burning of the factory paint finish and resulting painting touch up.

**Weld in place flat bar:** A heavy steel flat bar is provided. The flat bar is field welded to the existing structural channel. This arrangement is generally used for installation where the concrete has already been poured in place and a sufficient strong existing channel is in place.

**Important Note:** While the arrangement works well it relies on the field welding as the attachment to the rear pit wall. The welding required is substantial and the welds must high quality. The size, volume and quantity of welding for this arrangement is substantially greater than required for the same size of conventional pit type leveler. As well the high levels of welding results in a burnt paint finish and therefore paint touch up. For this reason the drop in style arrangement is recommended.

**Lifting Means:** During the installation process the vertical storing dock leveler is required to be lifted and positioned vertically into the installation back channel. This is generally accommodated with a crane or with a fork lift. If a crane is to be used and the crane will be reaching from the driveway into the building, consideration needs to be given to how much clearance exists at the top of the dock door. Based on the vertical orientation of the leveler it is not uncommon to experience clearance issues at the top of the door. The concern is more prevalent with longer vertical storing dock levelers such as 8ft long. Using a forklift addresses this concern as the forklift lifts from inside the building eliminating the overhead door clearance issue. In order for the forklift to be used properly the loading dock area floor should be in place. It provides a smooth stable surface for the forklift to work from. Based on the weight and size of vertical storing levelers it is vital to have suitable lifting and slinging equipment. No compromises should be made in this regard. Issues or mistakes in this regard can result in serious injury up to and including death and significant damage to property and objects around the loading dock. The requirements for vertical storing dock levelers are quite different than conventional pit type levelers. Installation crews that are trained and well equipped to install conventional pit type levelers may not be at all trained or properly equipped to install vertical storing dock levelers.

**Follow the Owner's Manual and Installation instructions:** These document(s) provide clear and detailed instructions on how to install, commission and operate the equipment. Following the instructions result in the highest probability of a successful installation. Failure to follow these instructions results in, danger, up to and including death, improper function of the equipment, damage to the equipment, damage to other equipment property around the loading dock. It is very important to follow installation instructions and operating instructions as set out in the manual. Please do this.

**For all questions contact Pentalift for guidance:** If there is any questions or uncertainty contact Pentalift for clarification. Based on the importance of proper installation, set up and use it is critical to be certain that installation and operation is as it should be. Call 519 763 3625 with any questions or concerns regarding vertical storing dock levelers or any other Pentalift product.

Note: Some photos may reflect products with optional features. All Pentalift Equipment Corporation products are subject to design improvement through modification without notice.

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