A SHIPPER'S GUIDE:

INTERMODAL CONTAINER LOADING BASICS

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IT'S IMPORTANT TO FOLLOW BLOCKING AND BRACING REQUIREMENTS TO SHIP FREIGHT SAFELY AND FOLLOW THE LAW

- Proper blocking and bracing will ensure your freight arrives at destination in the condition in which it was shipped.
- You will avoid delays and rework cost due to your load being rejected or "set out" while in transit.
- As responsible carriers and shippers we have an obligation to the public to operate in a safe responsible manner.
- Securing cargo for transit is the law.

Department of Transportation Rules and Regulations 49 CFR part 393.102

Cargo securement devices and systems must be capable of withstanding the following three forces, applied separately:

- *(a)(1) 0.8 g deceleration in the forward direction;*
- *(a)(2) 0.5 g acceleration in the rearward direction; and*
- *(a)(3) 0.5 g acceleration in a lateral direction.*

American Association of Railroads Intermodal Blocking and Bracing Requirements

Shipper expressly warrants that the intermodal unit is properly blocked and braced in accordance with the American Association of Railroads terms and conditions.

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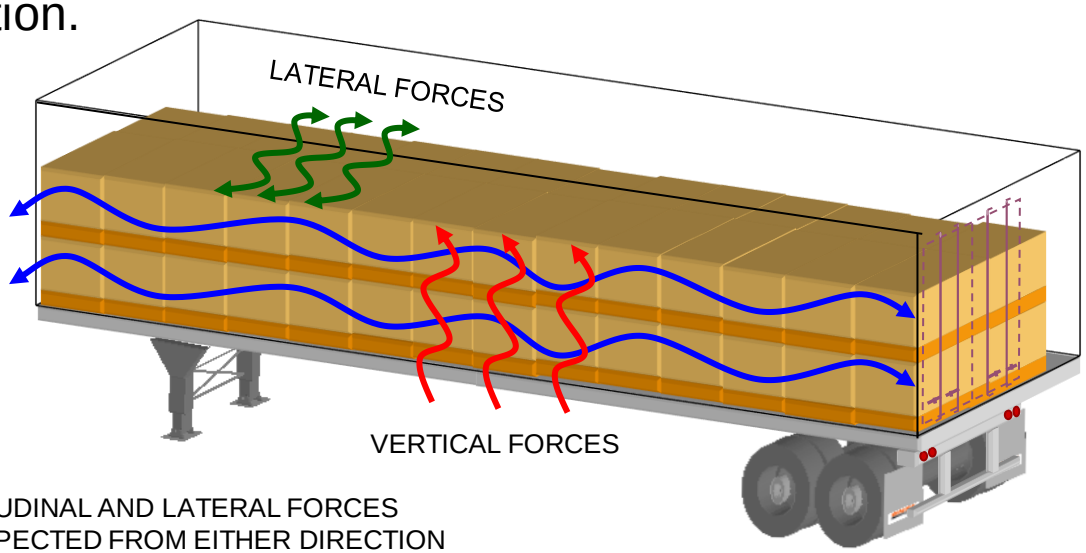
THE RAIL SHIPPING ENVIRONMENT

- Intermodal shippers must be aware of the physical forces that affect the load during transit.
- Vibration and shock are two main forces encountered in rail transportation.
- The forces occur continuously over many miles. Vibration, as result of an object oscillating and shock, as a result of an abrupt change in acceleration and direction.
- These forces can occur in three directions: vertical, longitudinal and lateral.
- Failure to control these forces can jeopardize the safe, damage-free movement of the freight.



NOTE: LONGITUDINAL AND LATERAL FORCES SHOULD BE EXPECTED FROM EITHER DIRECTION

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INTERMODAL LOADING, BLOCKING AND BRACING METHOD BEST PRACTICES

Multiple methods can be utilized to keep your freight in place during shipment. Best practice methods include:

- Lamination of floor blocking application
- Palletized loading with wood blocking application
- Disposable inflatable dunnage application
- Palletized loading with dunnage application
- Ty-Gard restraint system
- Rubber mats
- Door bracing

LAMINATION OF FLOOR BLOCKING APPLICATION

- Use 16d or larger nails to secure wood blocking. Use sufficient numbers of nails as the strength of floor blocking increases directly with the number of nails used. Nails must penetrate floor of vehicle a minimum of 1 inch to achieve required strength.

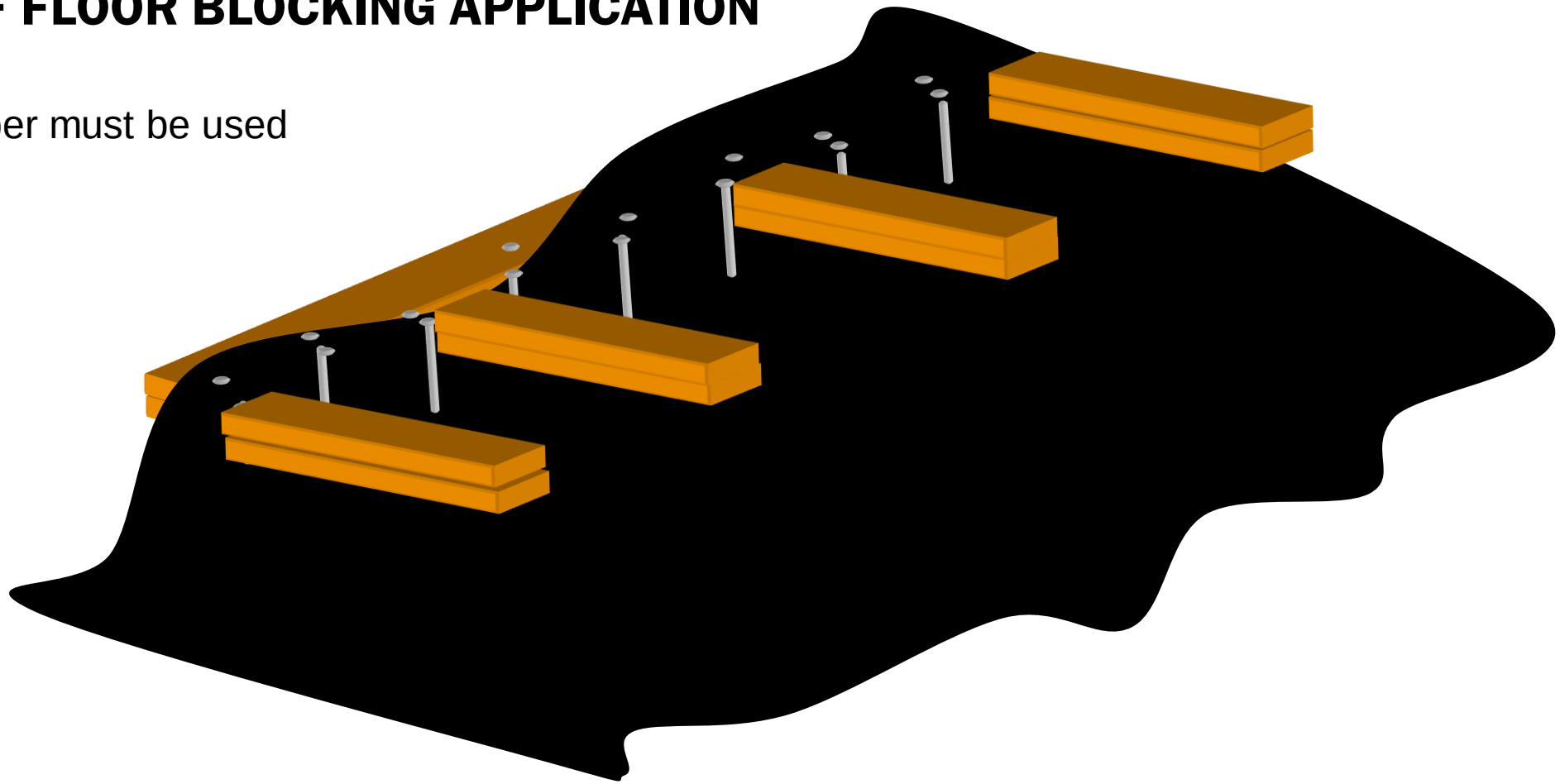
- Securely nail wood blocking to trailer/container floor. Laminate and apply back-up cleats to obtain maximum restraining capacity.

- A good application rule of thumb is to apply nails every 4 inches in an off-set pattern staggering the nails from the top of the board to the bottom.

- When laminating blocking never nail both boards to floor of trailer/container with a single nail. Nail one board to floor then nail the second board to the first board nailed in place.

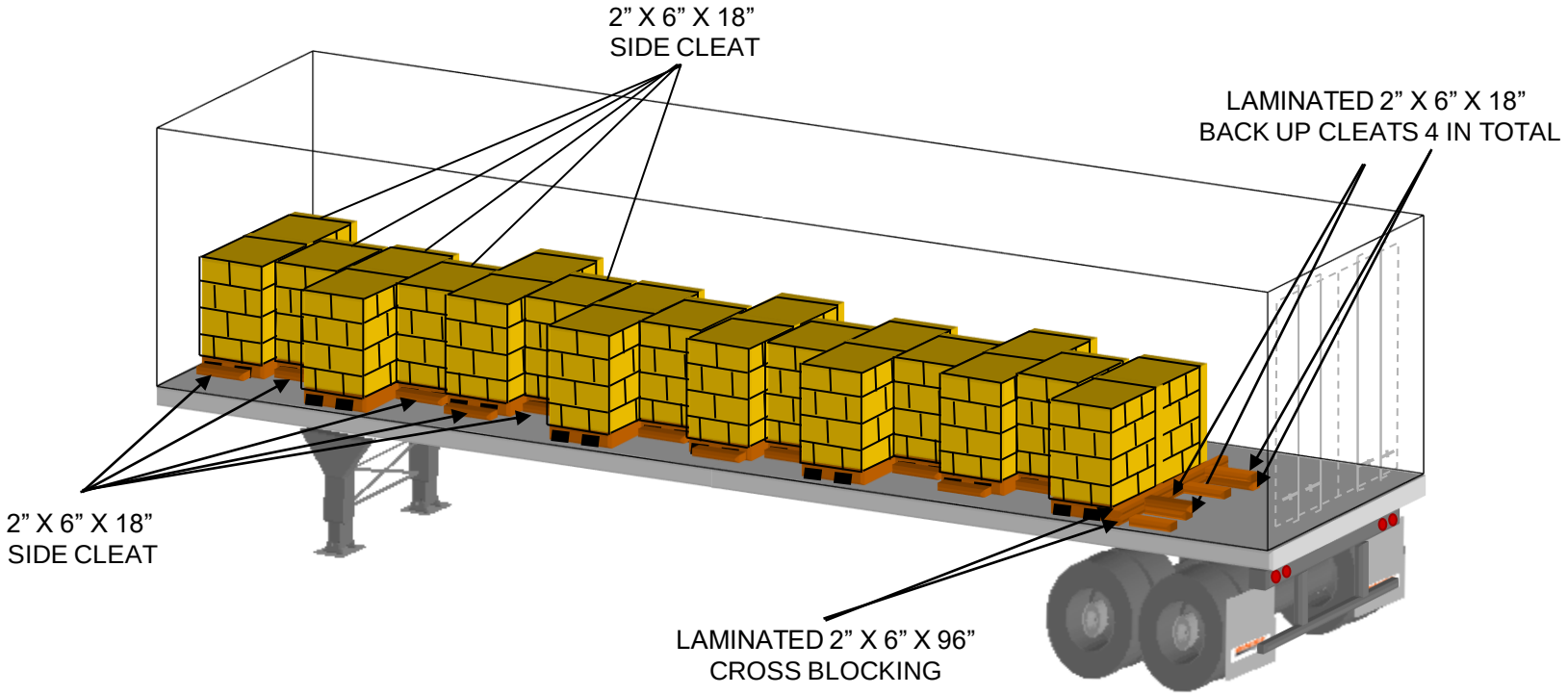
LAMINATION OF FLOOR BLOCKING APPLICATION

2 x 6 Laminated lumber must be used



PALLETIZED LOADING WITH WOOD BLOCKING APPLICATION

All floor blocking must be secured with 16d or larger nails placed in an off-set pattern every 4 inches. 18-inch side cleats must be applied to the void space side of each 2 across stack and on both sides of each single stack.



DISPOSABLE INFLATABLE DUNNAGE (DID BAG) APPLICATION

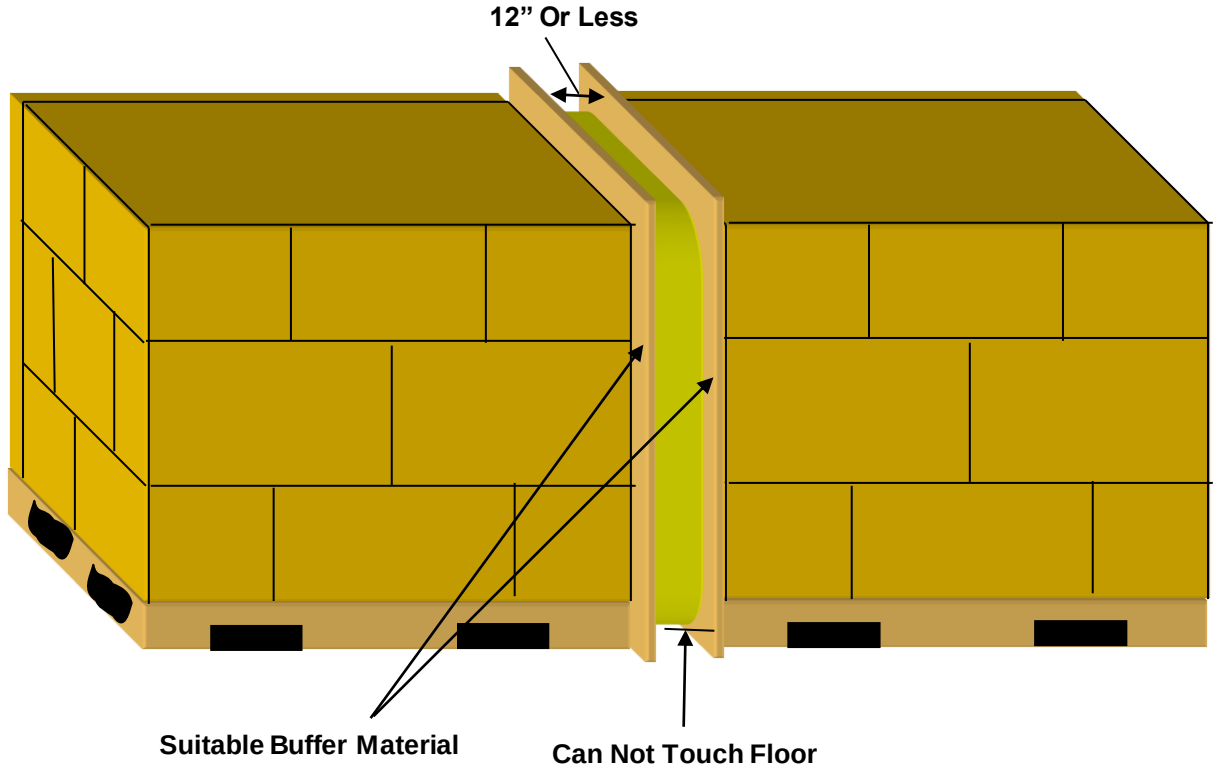
Dunnage (DID bags) must:

1. Not be applied in a void space in excess of 12 inches.

2. Be adequately buffered to prevent deflation enroute.

3. Be inflated between 1 & 2 PSI as measured with an air gauge.

4. Be placed in such a manner that they do not contact floor of trailer/container after inflation.



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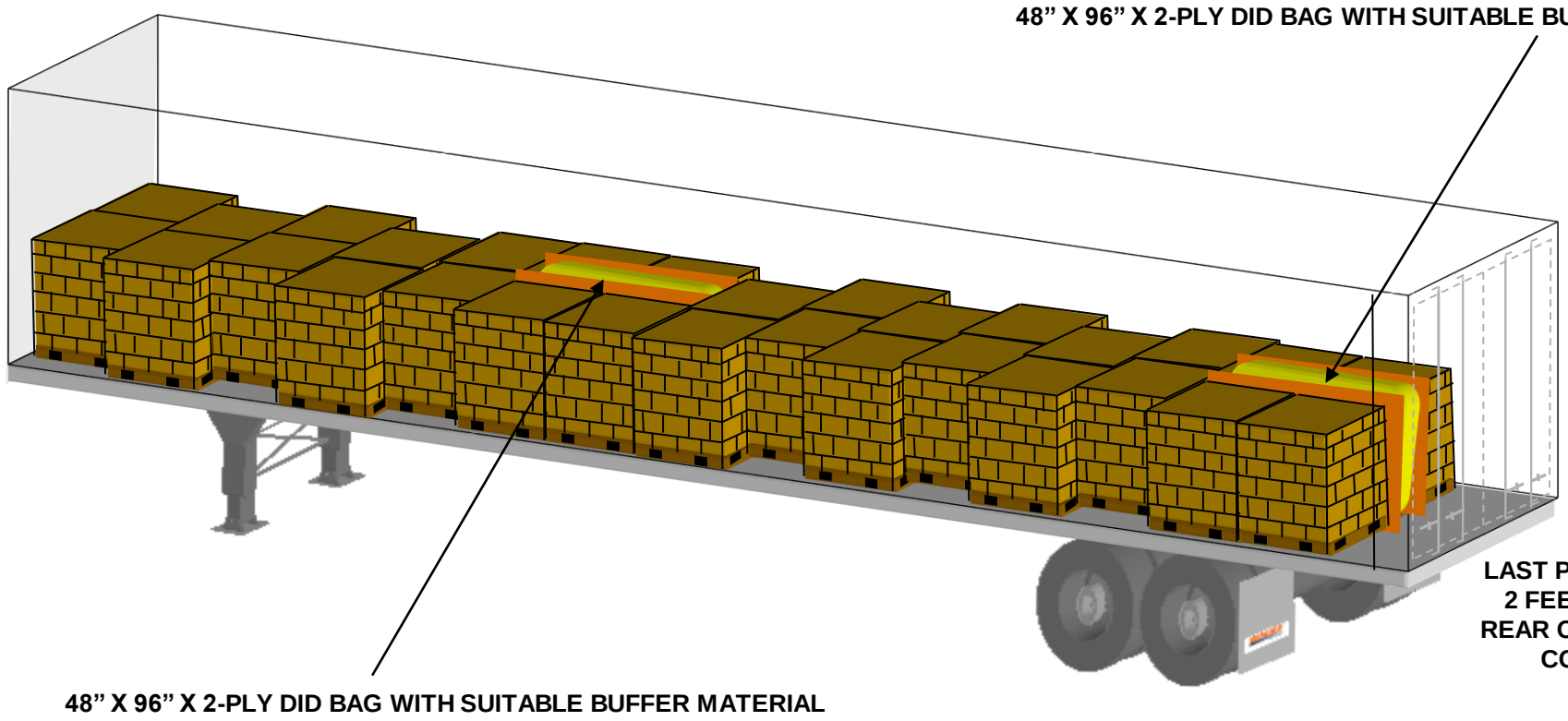
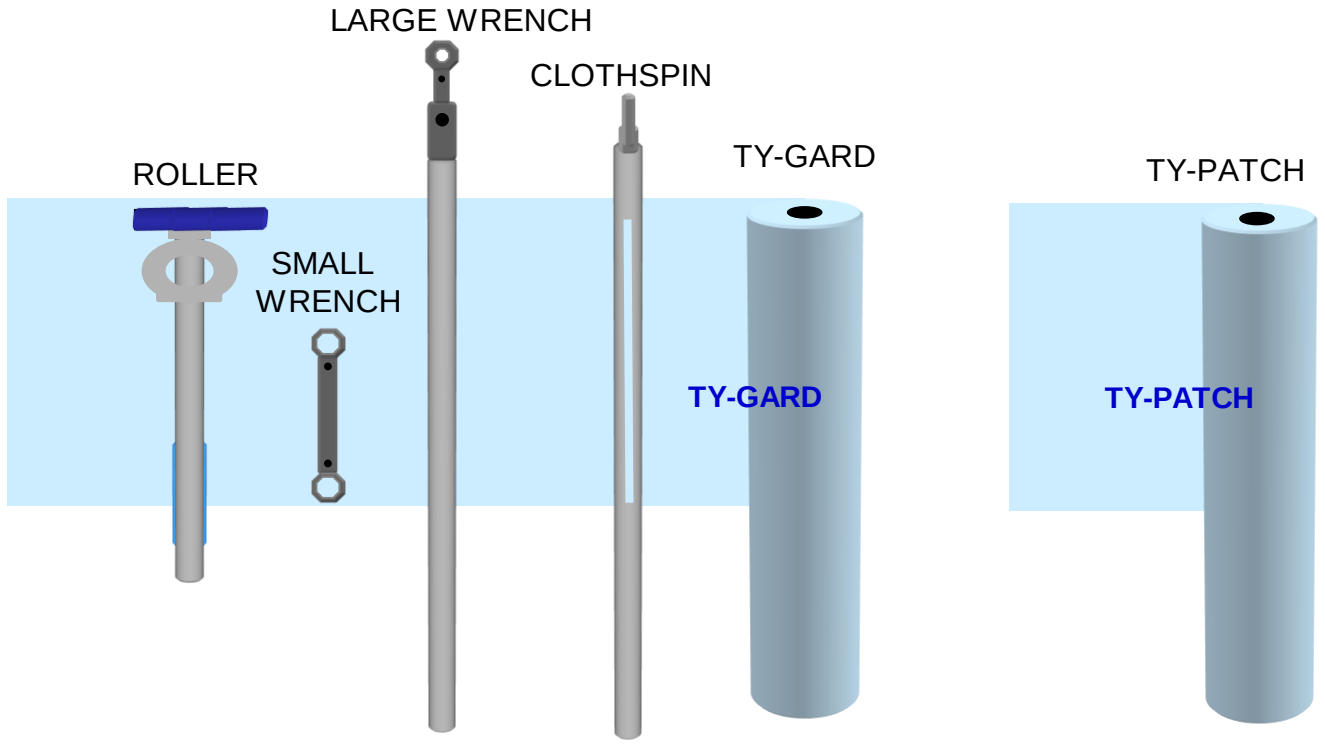
PALLETIZED LOADING DIAGRAM WITH DID BAG APPLICATION

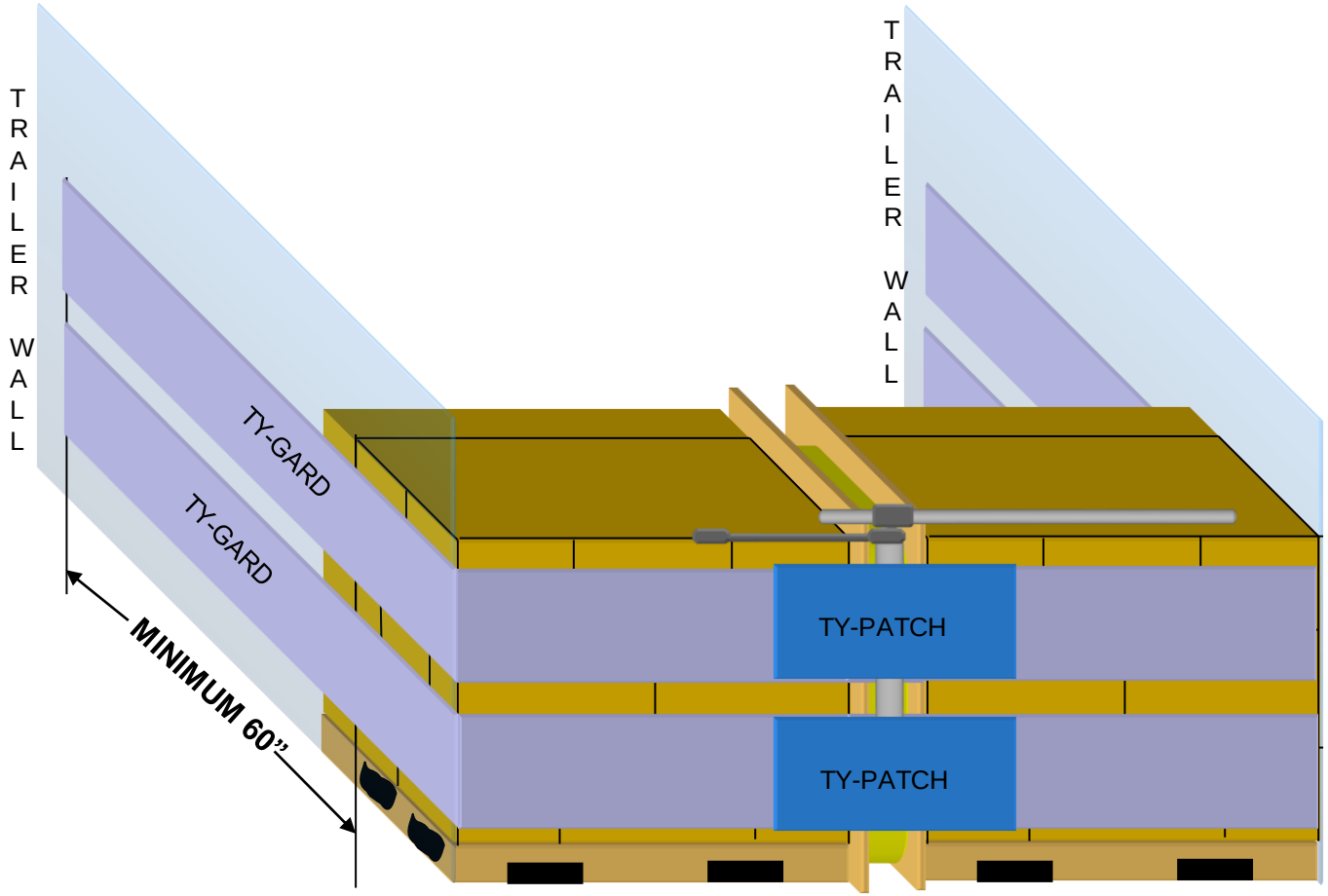


TY-GARD RESTRAINT SYSTEM

- Consists of 15-inch-wide bands of polyester fiber reinforced material backed with high-shear double-sided tape that is bound together with an adhesive overlapping 48-inch patch at rear of load.
- Ty-Gard bands are applied to side walls of trailer (minimum of 60 inches).
- Bands are then wrapped around rear of load, tensioned with a special tool, and secured together with a 48-inch Ty-Patch.
- Each single band barrier can restrain a maximum of 8,800 pounds.

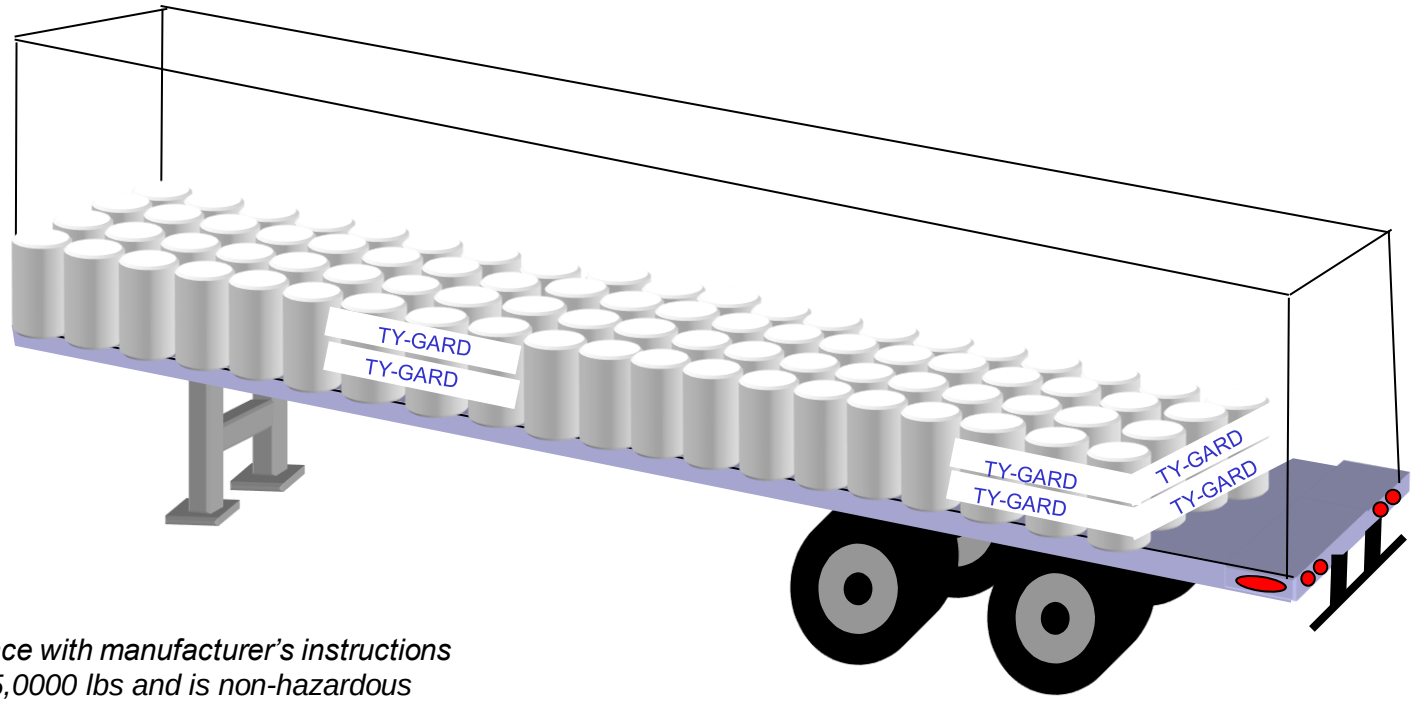


TY-GARD APPLICATION



TY-GARD APPLICATION

Floor loaded drums secured with Ty-Gard barriers; this depiction is an example of Ty-Gard. Applications are not a load diagram for securing floor-loaded drums. Call Schneider load engineering for a custom diagram.



**Ty-Gard barriers must be applied in accordance with manufacturer's instructions*
**Load depicted does not weigh in excess of 35,0000 lbs and is non-hazardous*

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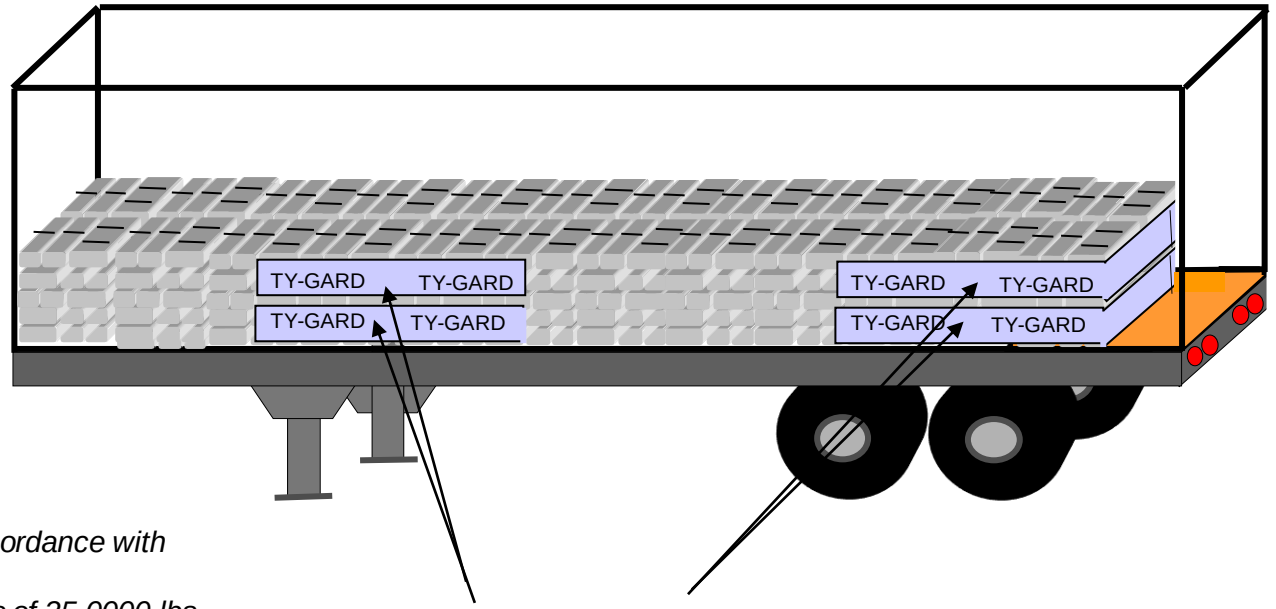
BAG PRODUCT SECURED WITH TY-GARD

Floor loaded bags secured with Ty-Gard. This depiction is an example of Ty-Gard securement and should not be considered a load diagram of floor loaded bags. Call Schneider load engineering for a custom diagram.



2 STRIP TY-GARD BARRIER

**Ty-Gard barriers must be applied in accordance with manufacturer's instructions*
**Load depicted does not weigh in excess of 35,0000 lbs and is non-hazardous*

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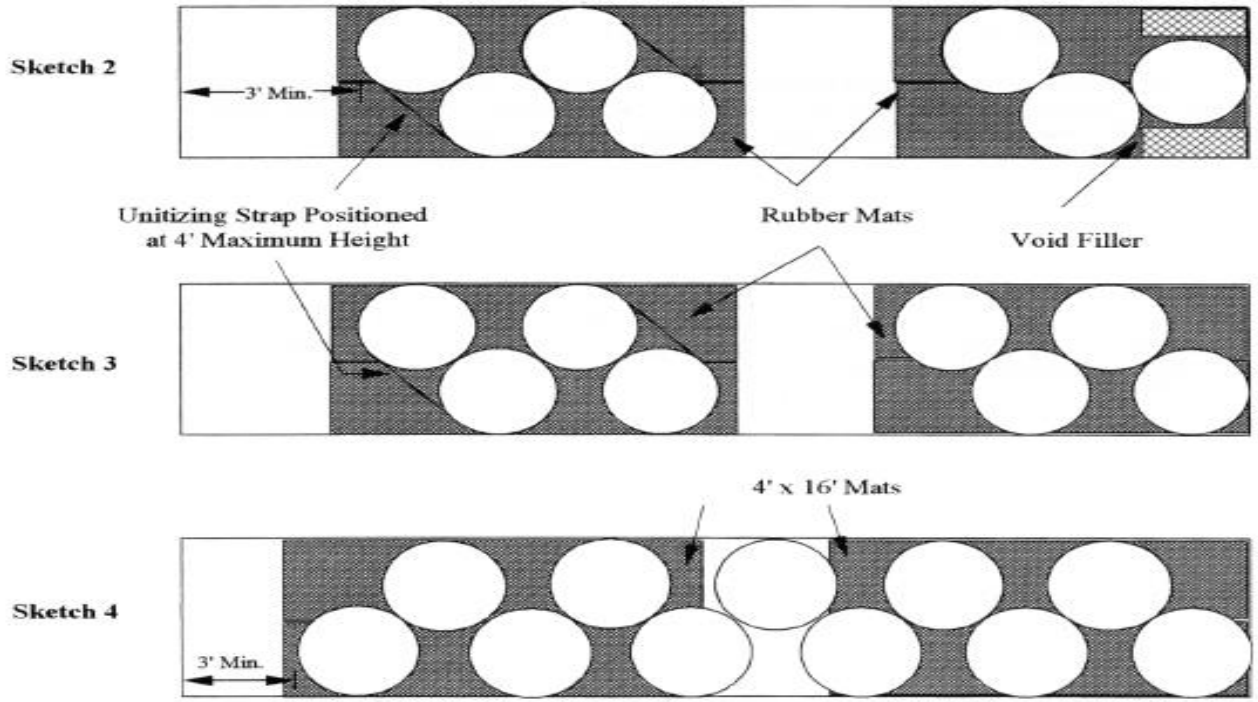
RUBBER MATS

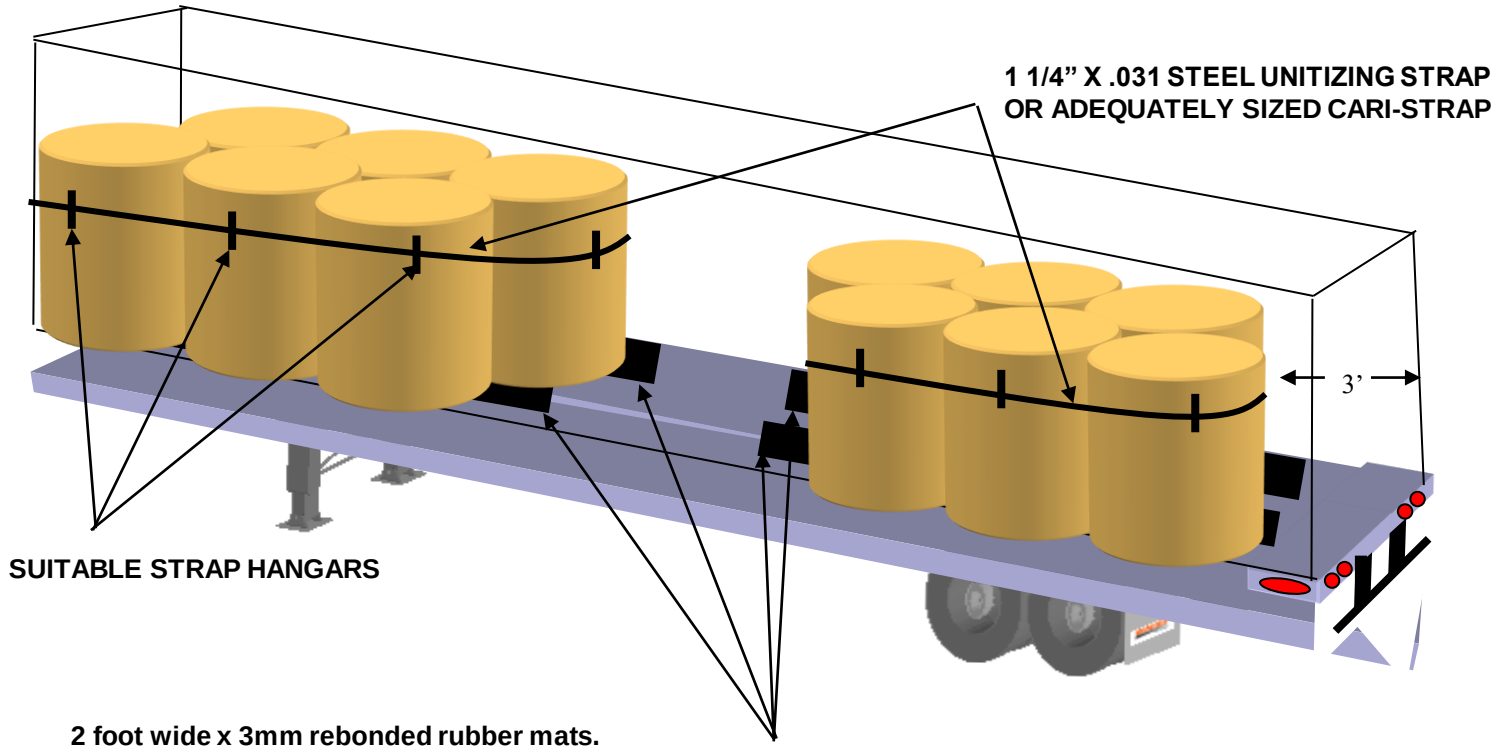
- Usually associated with rolled commodities such as paper or plastic.
- Come in various width and sizes.
- Come in various compositions.
- Must be applied in full-length sections or if pieced, must be butted edge to edge or slightly overlapped.
- Must generally be used in conjunction with some type of unitizing strap.



PAPER ROLL LOADING DIAGRAM WITH RUBBER MAT APPLICATION

- Rubber mats must be a minimum of 2 feet wide, 3mm thick and must be centered under each roll bottom.
- Mats must extend out a minimum of 8 inches beyond the end of each end roll in trailer.
- Container with the exception of the end roll loaded against the nose.
- Unitizing strap must not be placed further than 3 feet down from top of rolls and must be secured by adequate strap hangars — strap hangers must be secured to the trailer or container side wall.
- A minimum of 3 feet of void space must be maintained between the last roll loaded in trailer/container and the rear doors.
- Steel strapping can be substituted with adequate size and strength polyester strapping.

**Piecing of mats is acceptable as long as they are applied in conjunction with suitable unitizing bands*



2 foot wide x 3mm rebonded rubber mats.
Mats must be of sufficient length to contact all roll bottoms and to extend at least 8 inches beyond ends of roll sections not in contact with trailer/container nose.

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BLOCKING AND BRACING METHODS FOR VARIOUS COMMODITIES

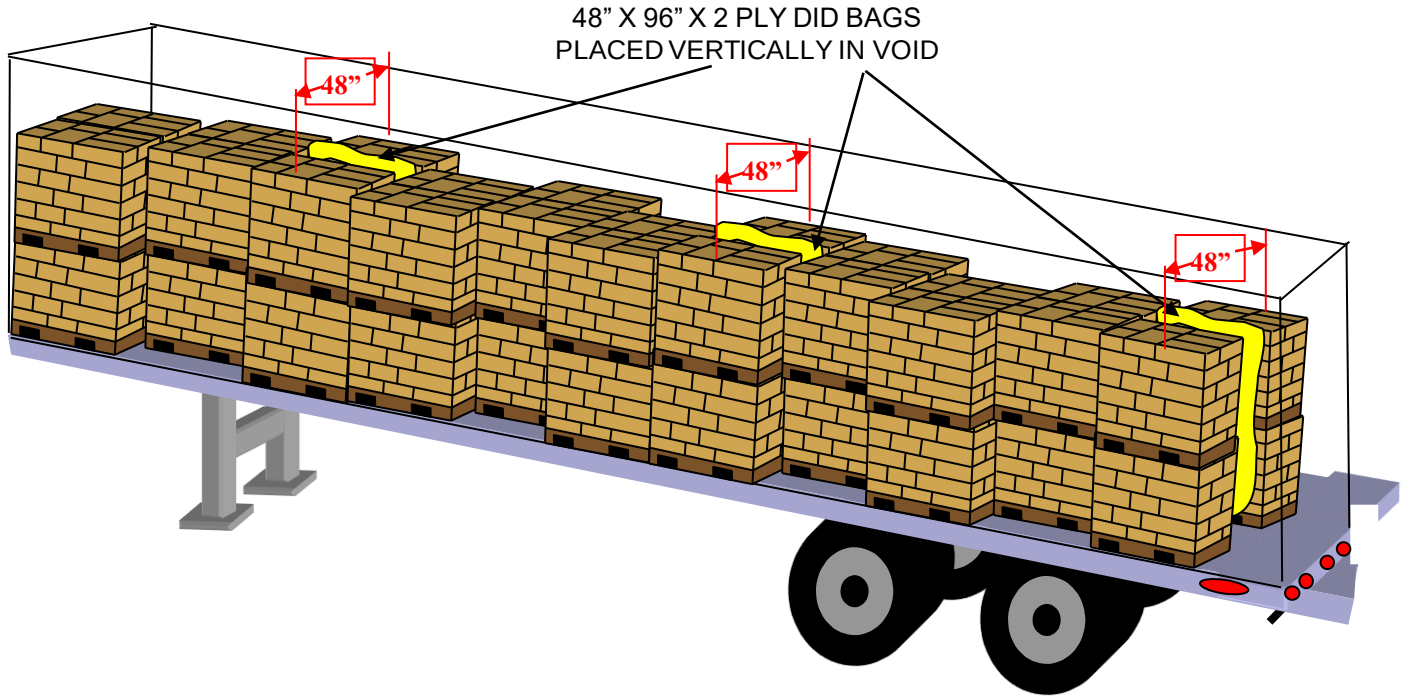
Using the basic concepts depicted earlier, the following blocking and bracing methods can easily and cost effectively be applied.

The following slides show methods for blocking and bracing:

- Case goods
- Rolled paper
- Drums
- Bagged product
- Various other miscellaneous commodities

LOADING METHOD FOR PALLETIZED/STRETCH-WRAPPED DOUBLE-STACKED PALLETS WITH DID BAG APPLICATION

- DID bags must not be used in void spaces in excess of 12 inches, must not contact floor of trailer or pallet after inflation, must be adequately buffered when in contact with rough surfaces, and should be inflated between 1-2 psi.
- All units must be properly stretch-wrapped to maintain adequate vertical alignment during the transportation cycle trailer (3 to 4 wraps per unit). Cross-wise void fillers must be used, and the last pallet should be at least 2 feet from rear of trailer.
- Pallets placed at points where DID bags are applied must be placed with the 48-inch dimension running crosswise in the trailer.



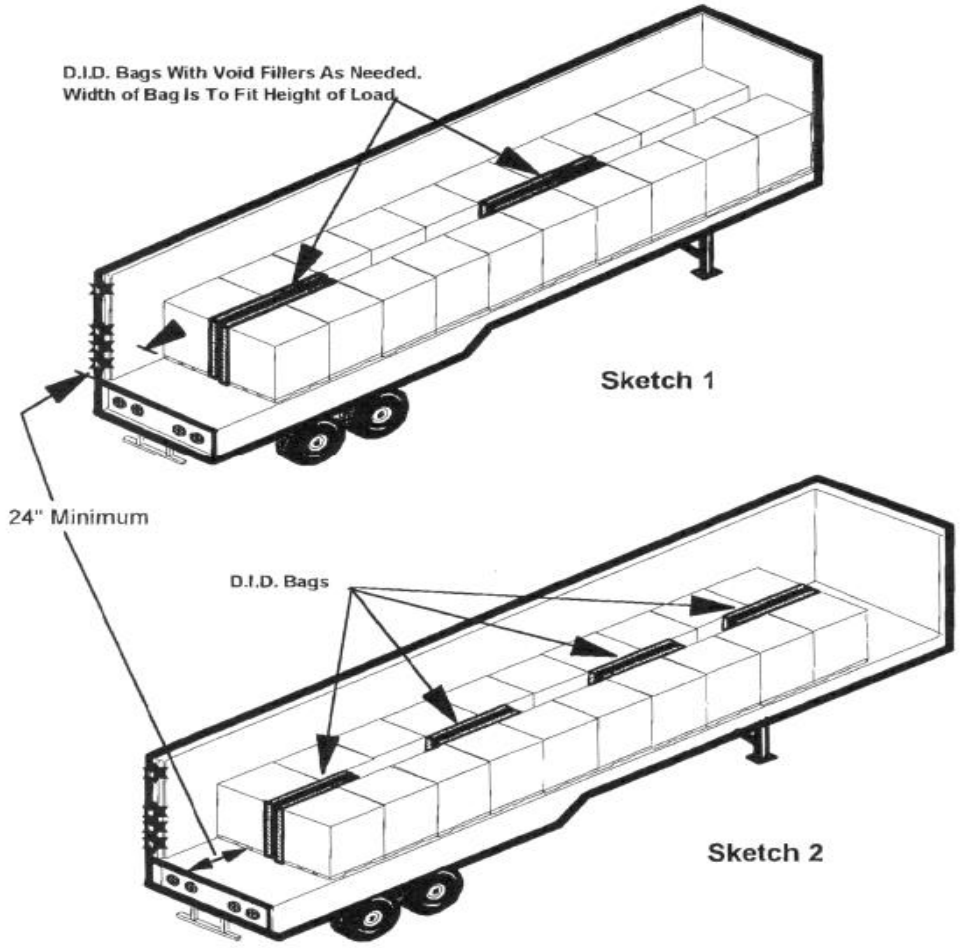
DID BAG APPLICATION

Sketch 1 (top): This method is used for loads in which the lading is positioned against the front-end wall.

Disposable inflatable dunnage (DID) bags are used at two locations in the load, at the 4th and 5th stacks and at the last two stacks. The illustration shows 10 units in two rows. Dependent on the trailer size and unit weight, varying numbers of units may also be loaded. In any case, the first DID bag restraints approximately ½ the load. Use the DID bags wide enough to extend from 4 inches above the floor to the top of the lading. Minimum DID bag size is one 48”x96” bag or two Centerload Shipping Technologies’ 48”x48” bags at each location.

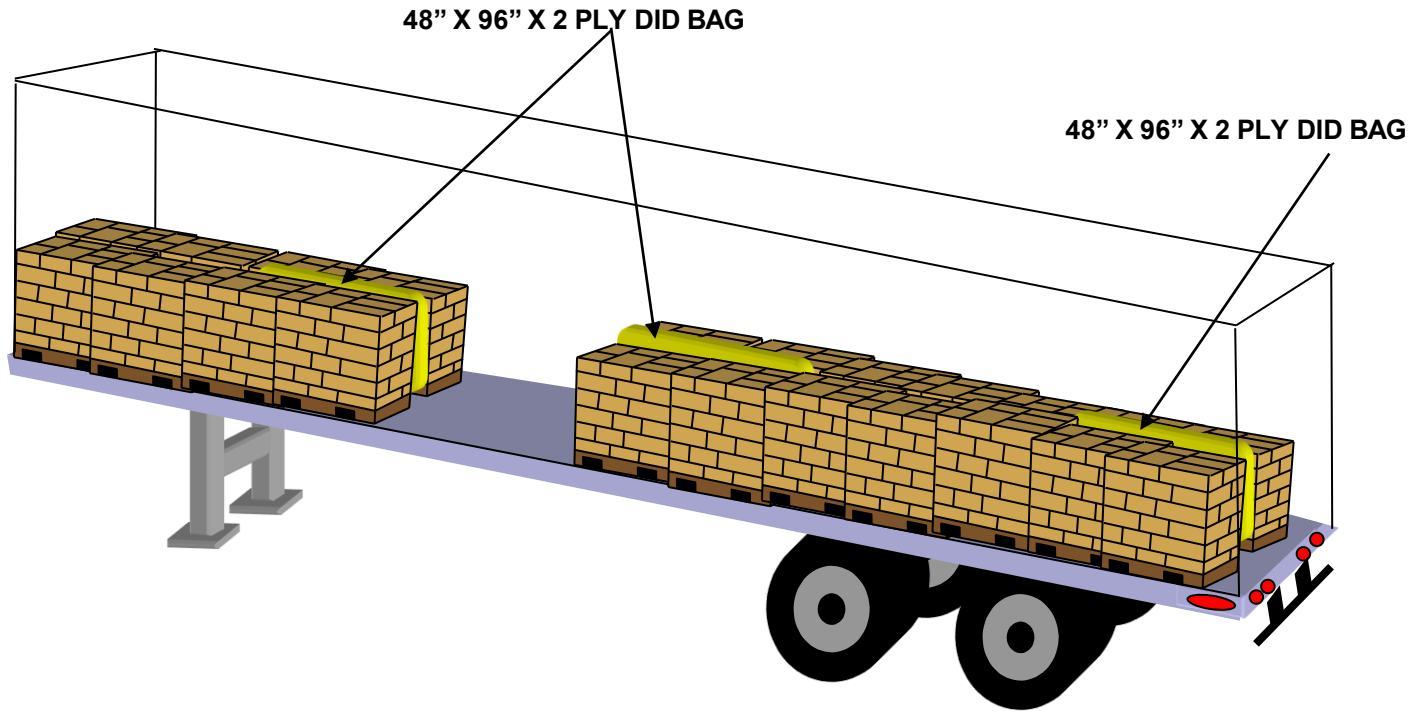
Sketch 2 (bottom): This method is used for case goods utilized on pallets when there is unfilled lengthwise pallet under hang and/or for case goods unitized on pallets or slip sheets which are loaded away from the front-end wall to obtain proper weight distribution.

Disposable inflatable dunnage (DID) bags are adjacent to ever stack in the load. The DID bags contact the full surface of the units along the center void of the trailer as shown in the illustration. The illustration shows 10 units in two rows. Dependent on trailer size and unit weight, varying numbers of units may also be loaded. Use DID bags wide enough to extend from 4 inches above the floor to the top of the lading. Minimum DID bag size is one 48”x96” bag or two 48”by48” bags at each location.



LOADING METHOD FOR PALLETIZED/STRETCH-WRAPPED FREIGHT WITH DID BAG APPLICATION

- DID bags must not be used in void spaces in excess of 12 inches, must not contact floor of trailer or pallet after inflation, must be adequately buffered when in contact with rough surfaces, and should be inflated between 1-2 psi.
- All units must be properly stretch-wrapped to maintain adequate vertical alignment during the transportation cycle (3 to 4 wraps per unit) and single units must be heavily stretch-wrapped to obtain optimum restraining capacity.
- Pallets are placed in load with the 48-inch dimension running crosswise last pallet must be at least 2 feet from the rear of the trailer.



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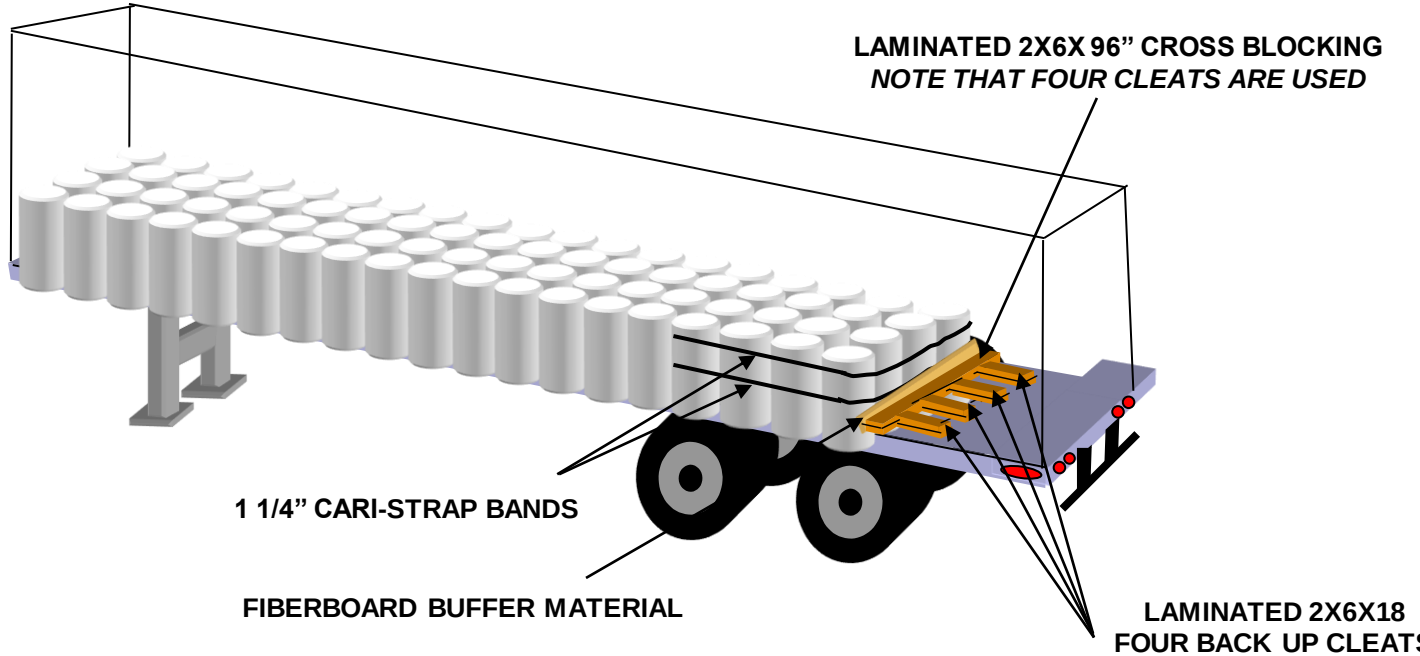
DID BAG APPLICATION

WOOD BLOCKING APPLICATION

Floor loaded drums secured with laminated wood blocking Cari-Strap unitizing bands. This depiction is an example of wood blocking and should not be considered a load diagram of floor-loaded drums. Call Schneider load engineering for a custom diagram.



**Floor blocking to be secured with 16d or larger nails placed every 6 inches in an off-set pattern.*

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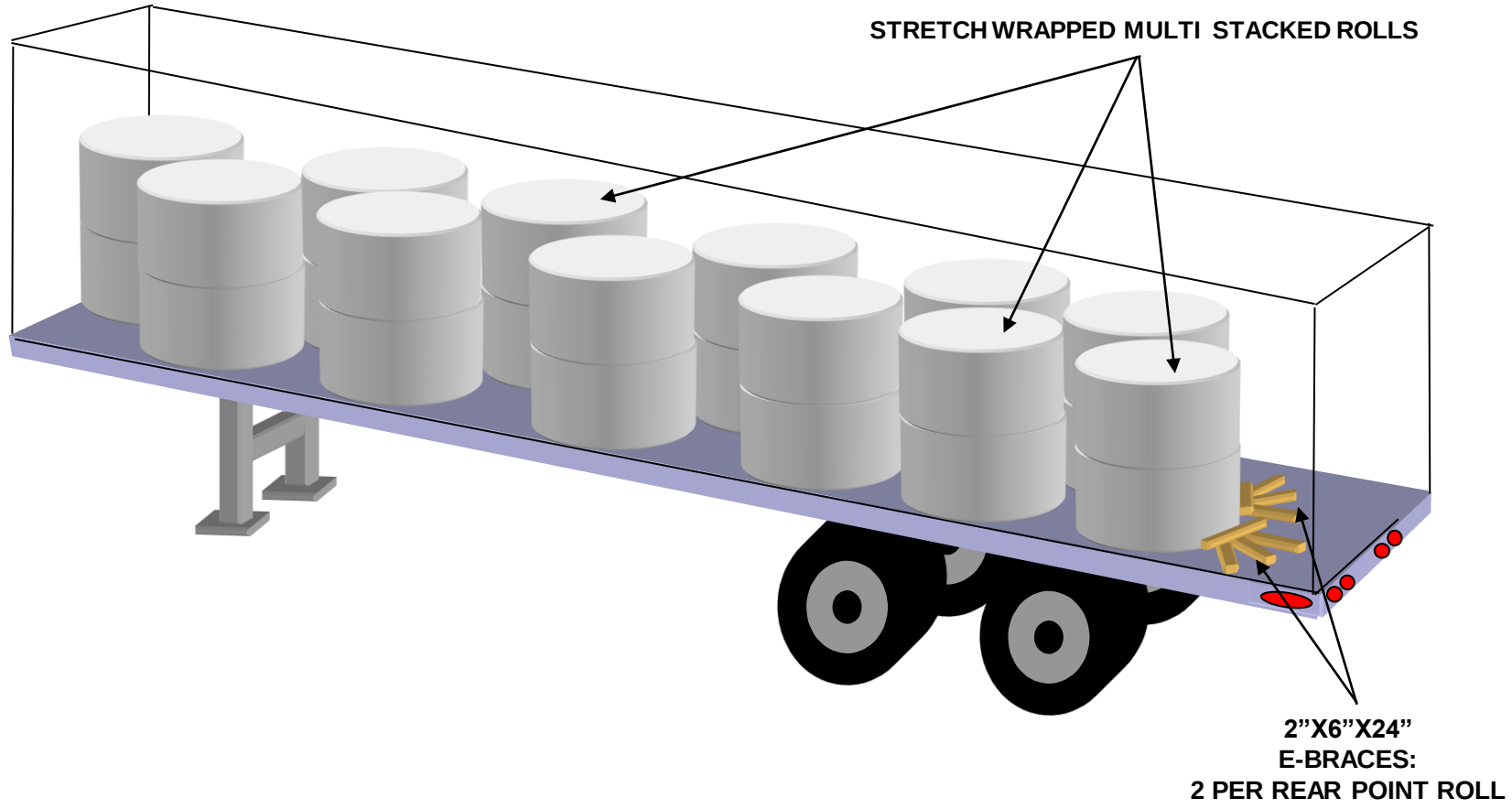
LOADING METHOD FOR LARGE DIAMETER ROLLS
1-1 OFF-SET PATTERN BRACED WITH 2X6 E-BRACES



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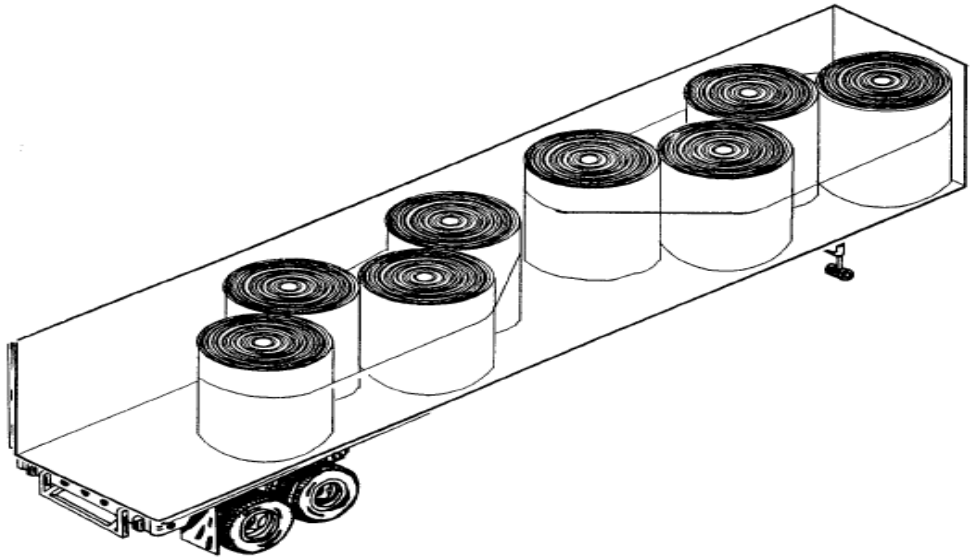
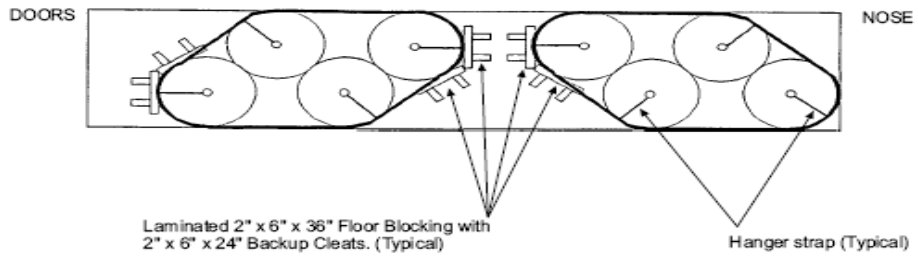
PAPER ROLL LOAD DIAGRAM WITH WOOD BLOCKING APPLICATION

This loading method is for 58-inch diameter roll pulpboard loaded on end in a 1-1 off-set pattern in a trailer or container for intermodal service. This method was tested in a 102-inch-wide trailer. Plan the load to equalize the weight on each side of the trailer or container. Since roll weights vary, this will require attention to pre-planning. A balanced load is required for the stability and success of this loading method.





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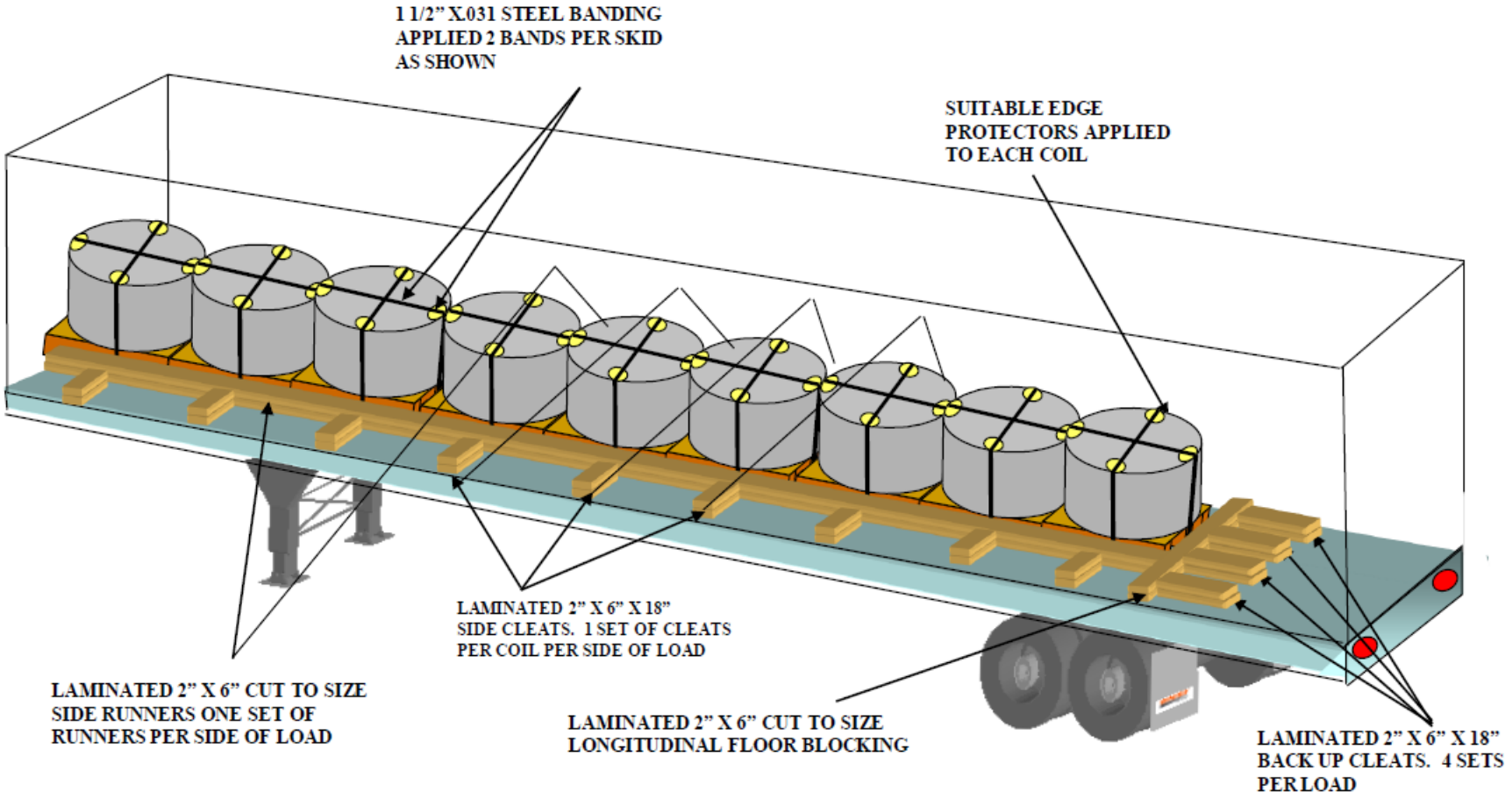
WOOD BLOCKING APPLICATION

LAMINATED 2”X6”X24”
E-BRACES: 2 PER REAR POINT ROLL

METHOD FOR IN-LINE LOADING OF SKIDDED ALUMINUM COILS UNDER 3,500 POUNDS USING WOOD BLOCKING APPLICATIONS



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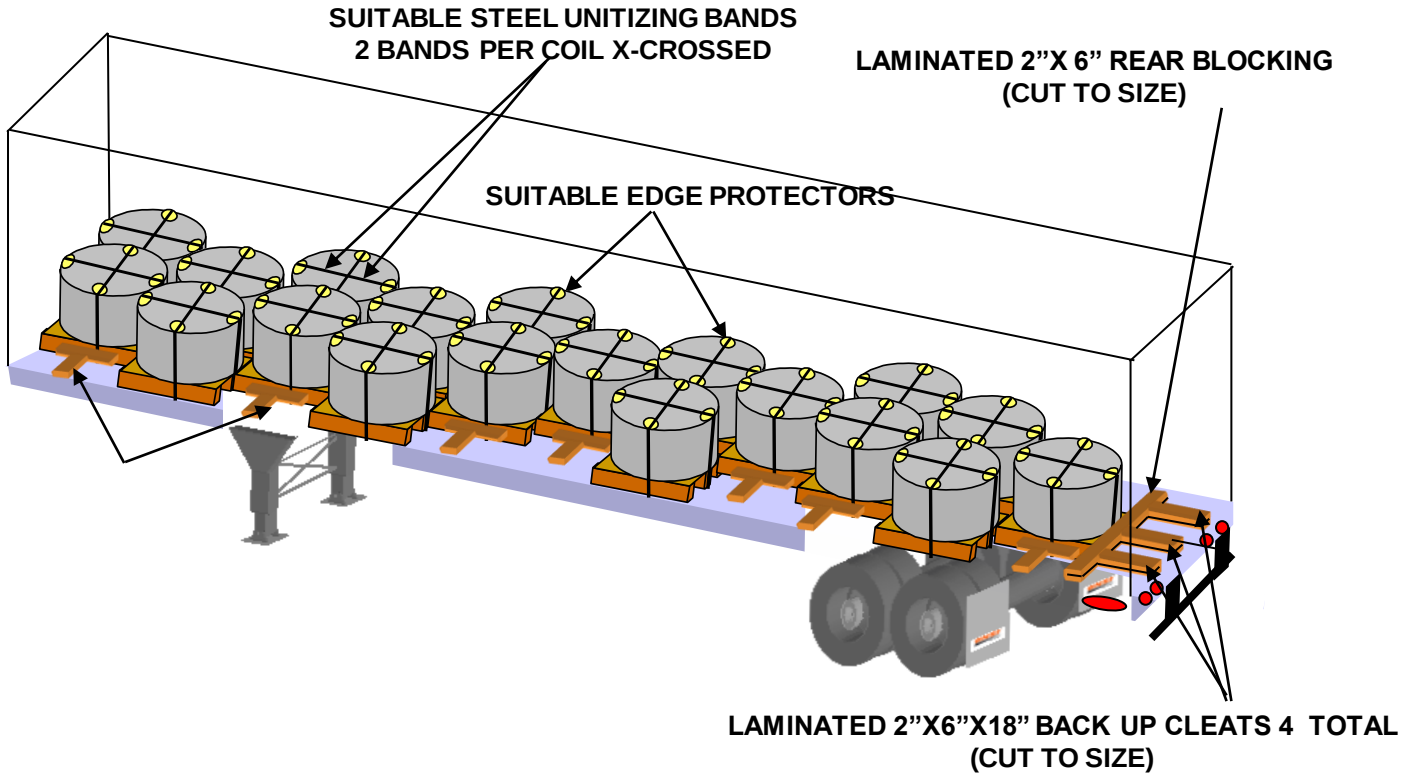
METHOD FOR ALUMINUM COILS
LESS THAN 3,500 POUNDS USING WOOD BLOCKING APPLICATION

- Side “T” braces are made of 2x6 lumber one board thick.
- Rear blocking is made of 2x6 lumber laminated two boards thick.
- All wood blocking must be secured with 16D or larger nails placed in an off-set pattern every 4 inches.
- Stagger rows of 2 wide units from side to side and block side with void space.
- Center singles and block both sides.

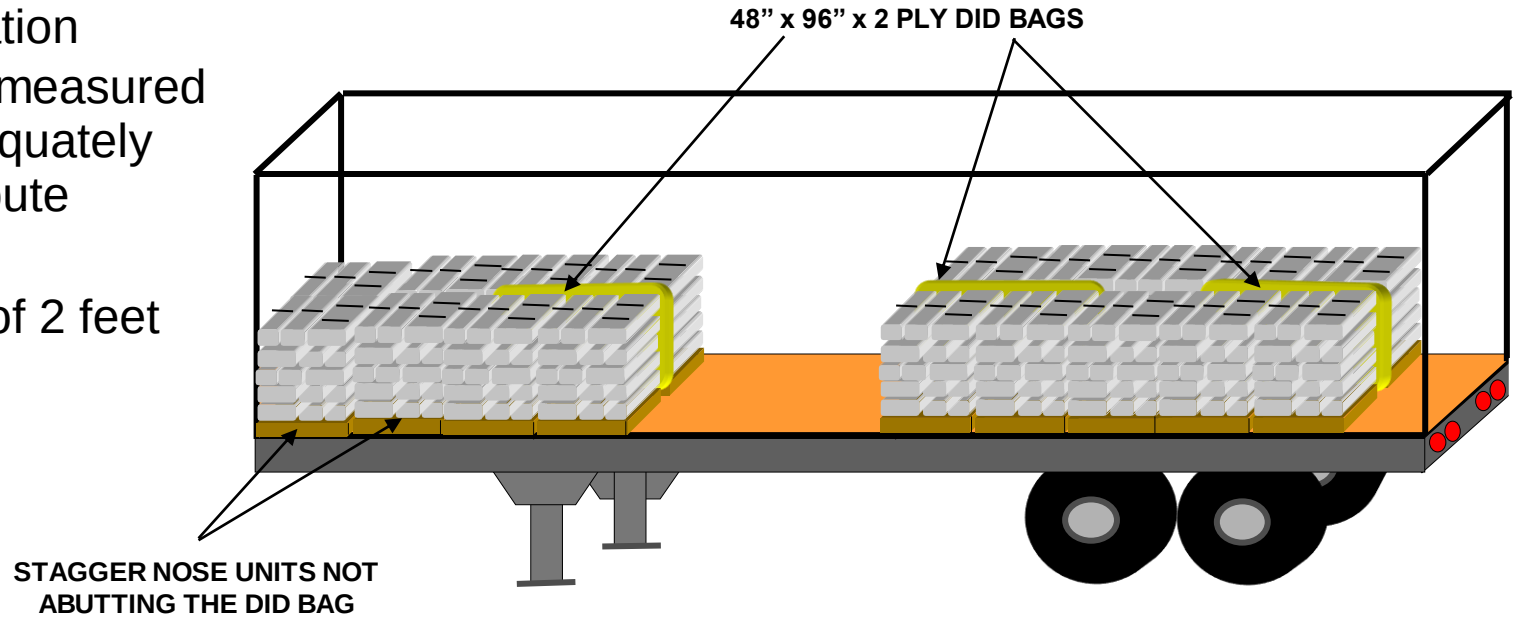


LOADING METHOD FOR 18 PALLETIZED/STRETCH-WRAPPED PALLETS OF BAGGED PRODUCT BRACED WITH DID BAGS

DID bags must:

- Not be used in a void space in excess of 12 inches wide
- Not contact floor of unit after inflation
- Be inflated between 2 & 3 psi as measured by an air gauge and must be adequately buffered to prevent deflation enroute

The last two pallets must be a min of 2 feet from the rear of the trailer.



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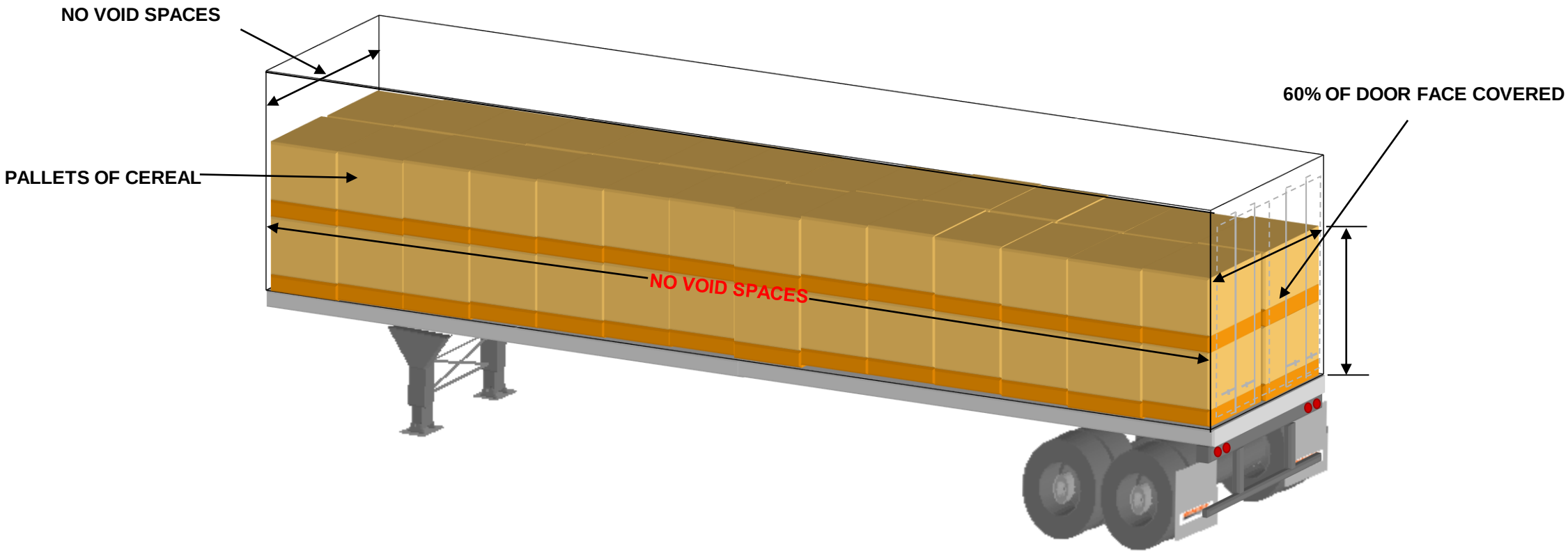
DOOR BRACING

When using the doors of the trailer/container to restrain the load, the doors of the trailer can be used to restrain the load if the following conditions are met:

- Only non-hazardous materials are loaded in the vehicle.
- Load must consist of multi-unit lading such as boxes of food-stuffs, soft paper products, furniture, appliances, etc.
- Total lading and pallet weight does not exceed 40,000 pounds.
- Lading is loaded tightly lengthwise and crosswise and flush to the rear doors of the vehicle allowing no room for movement. If any void exists, they must be filled with dunnage materials.
- Rear face of the load must cover a minimum of 60% of the door area and be evenly distributed throughout the vehicle.
- The doors of the vehicle must fit squarely, the hinges must be tight, and the locking bars must be in good condition and functioning properly.

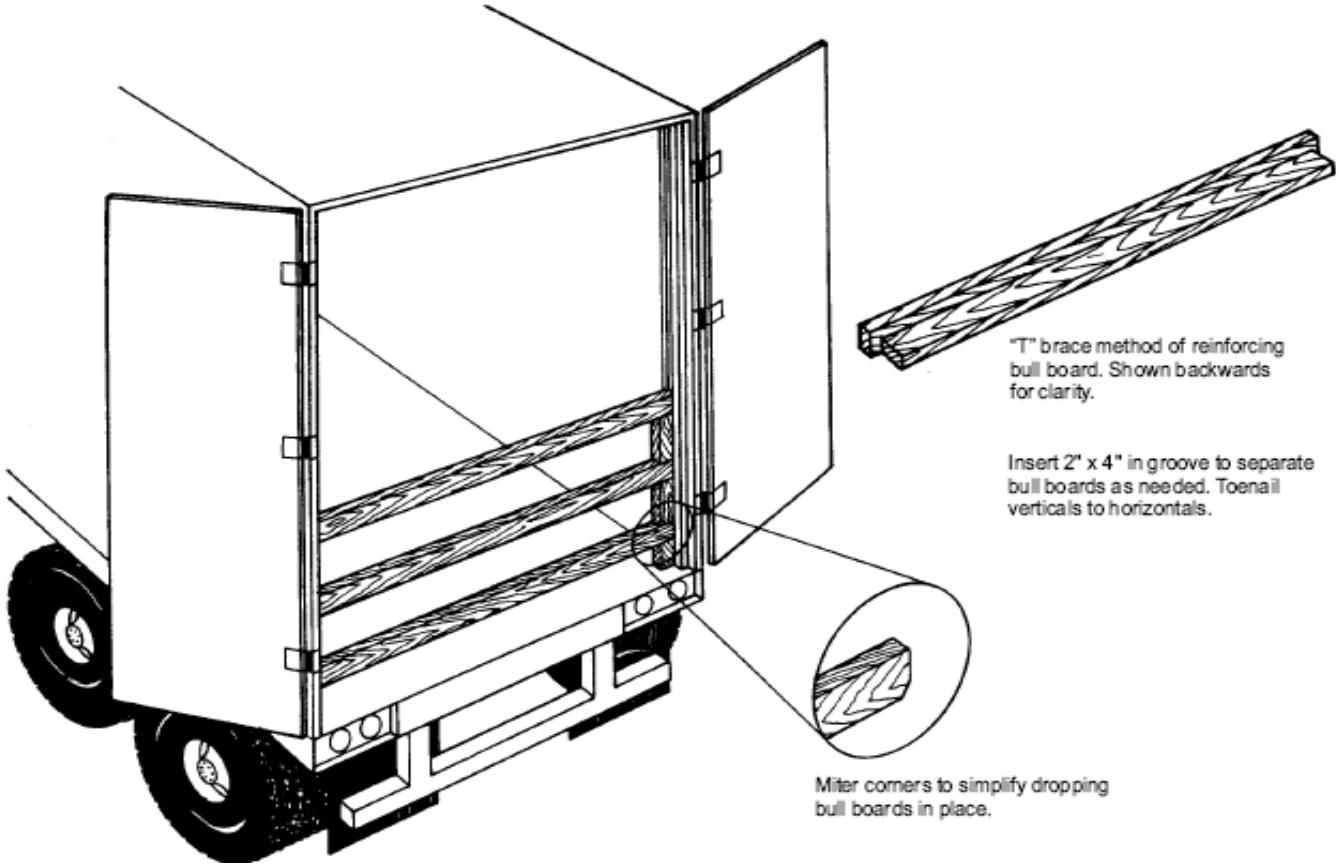
DIAGRAM OF FLOOR-LOADED CASED GOODS SHOWING REAR DOOR APPLICATION



DOOR BRACING APPLICATION

Restraint Device	Capacity
2”x4” Bull Board	5,600 lbs.*
2”x6” Bull Board	8,000 lbs.*
2”x4” “T” Brace	7,000 lbs.*

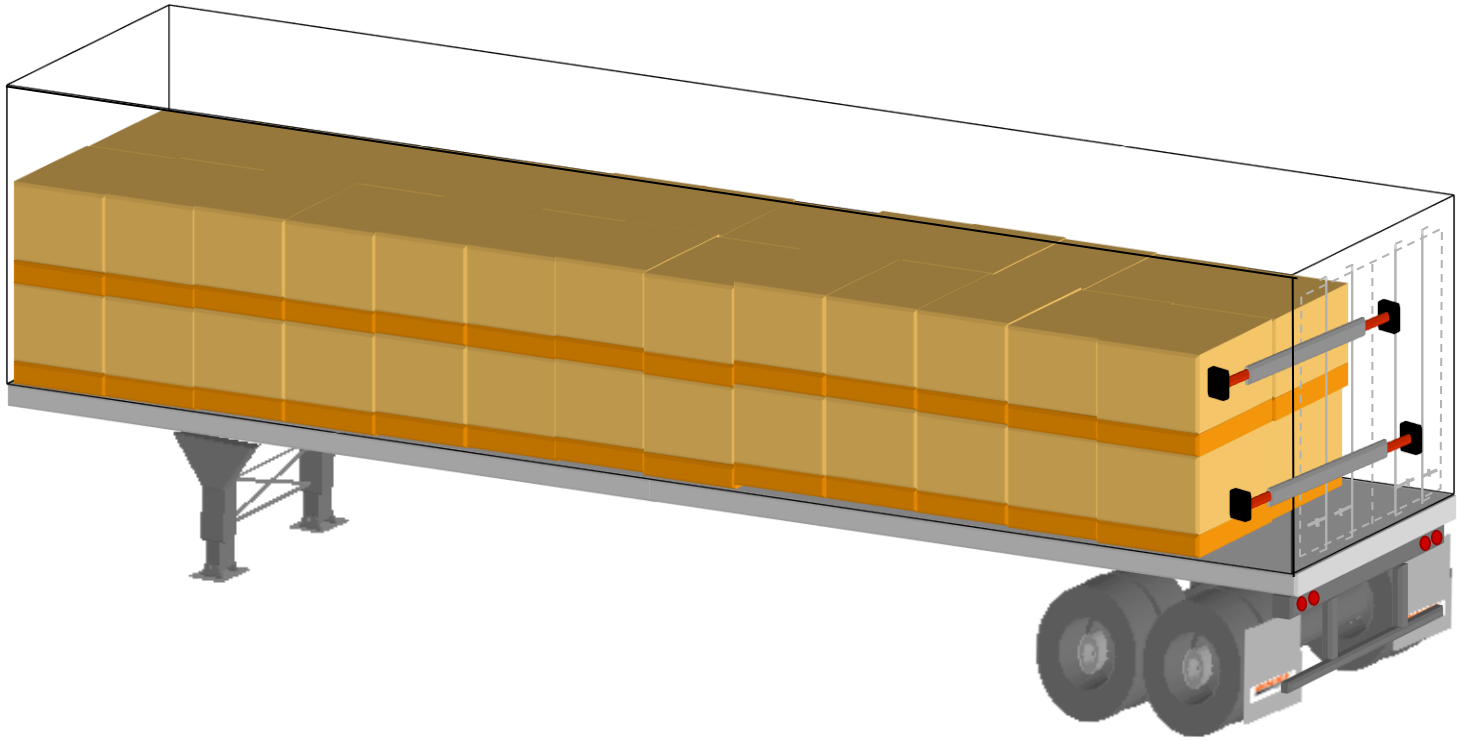
**Figures developed through testing of Bull Boards and “T” Braces constructed of Yellow Pine.*



REAR DOOR APPLICATION

LOAD LOCK BARS

Load lock bars are not acceptable for securing intermodal freight.



CONTACT US TO GET PROFESSIONAL HELP SECURING YOUR FREIGHT

REMEMBER:

- If you leave space for an intermodal load to move into, it will.
- If you fill all space with product, filler materials or secure in place with adequate load restraining devices, it won't.

CONTACT US:

Schneider's Intermodal engineering experts will analyze your freight to recommend what methods you should be using to properly ship your freight.

Gary Jashinsky
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