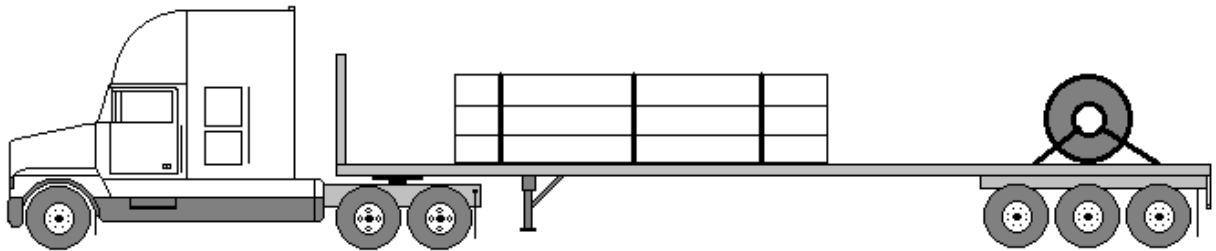


**National Safety Code Standard 10
Cargo Securement**

Interpretation Guide



November 18, 2005

Disclaimer

The guidance which is provided in this document is offered for convenience only. For accurate reference, please consult the National Safety Code Standard 10 (www.ccmta.ca) and the applicable provincial and territorial regulations.

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Part 1 – General Provisions

Division 1 – Application

1. Application:

Does the NSC Standard apply to vehicles registered in a jurisdiction that does not require a registered gross weight rating on the registration document unless the vehicle is registered for 5,000 kg or more, and travel into another jurisdiction that would require a registered gross weight on the registration document?

Comments: The standard generally applies to any commercial vehicle or combination of vehicles with a registered gross weight in excess of 4500 kg. However application does vary between provinces and territories, and local regulations should be consulted.

2. Shipper Responsibility

Can a shipper be charged for insecure cargo on or in a vehicle (sealed or not)?

Comments: Not under NSC Standard 10 – but provincial and territorial regulations should be consulted.

3. Inspection of Sealed Vans

Is the driver required to show some proof that there was instruction or an order not to open the vehicle for inspection?

Comments: The NSC Standard does not specifically require some form of written documentation. However, it would be good practice to have documentation from the shipper or carrier that indicates that the driver was instructed not to break the seal and inspect the load.

4. Inspections

What documentation is required of the driver to demonstrate inspections have been carried out?

Comments: The Standard does not require specific documentation, but changes of duty status must be recorded in the driver's Log Book.

5. Inspections

When a driver assumes responsibility for a previously loaded trailer (interline), is an inspection of the cargo securement system required within the first 80 km of travel (Section 3(2)(b))?

Comments: No, provided changes have not been made to the cargo or the securement system.

6. Inspections

Section 3(3)(c) specifies that the cargo securement system must be inspected “when the vehicle has been driven 240 kilometres”. Does this mean for each 240 km of the trip, or just at the first 240 km?

Comments: It is for every change in duty status, every 240 km of travel or every three hours, which ever occurs first.

Division 2 – General Performance Criteria

1. Defective Securement Equipment

The NSC Standard stipulates that components of the cargo securement system of a vehicle “shall have no knots, damaged or weakened components that will adversely affect their performance for cargo securement purposes” (Section 4(2)). How is it established that the performance of a component will be “adversely affected?”

Comments: The CVSA publication “North American Cargo Securement Standard and Tiedown Guidelines” provides guidance for determining when tiedowns and other securement equipment require repair or replacement. (www.cvsa.org)

2. Fully Contained

What is fully contained?

Comments: By definition (in NSC Standard 10), cargo is considered to be “contained” when:

- the cargo fills a sided vehicle, and
- every article is in contact with or close to a wall or other articles, and
- the cargo cannot move or tip

Division 3 – Requirements for Cargo Securement Systems

1. Commodity Specific Requirements

When applying the NSC securement standards to commodities specific in Part 2 of the standards, can the securement requirements in Part 1 be utilized instead of Part 2?

Comments: No. However, the requirements of Part 1 also apply to the commodities listed in Part 2 – if there is a conflict between Part 1 and Part 2, the provisions of Part 2 prevail.

2. Void Fillers:

Do void fillers used to immobilize cargo need to be secured to the vehicle?

Comments:

Void fillers are interpreted to mean material used to fill a space between articles of cargo, and cargo is interpreted to mean all articles or material carried on a vehicle. Consequently, void fillers would be required to be contained, immobilized or secured to the vehicle.

3. Edge Protection

The requirement to use edge protectors is very vague, are there guidelines on when edge protection must be provided?

Comments:

It would be impossible to list every possible type of commodity for which edge protection must be used. As examples, lifts of dressed lumber would not normally require edge protection as the corners are generally rounded. At the other extreme, bundles of flat sheet metal, or fabricated metal structures with sharp edges have been shown to easily cut through synthetic webbing. It would be reasonable to assume that if, on inspection, there is evidence of tiedown abrasion or cutting, corrective measures would be required before the vehicle could continue to operate on a public highway.

4. Friction Mats

What can be used as a friction mat?

Comments: Devices used as friction mats must be designed, manufactured and suitable for use as cargo securement equipment.

5. Friction Mats

How many times may friction mats be used?

Comments: The NSC standard does not limit the number of times a friction mat may be used (manufacturer's instructions should be consulted).

6. Friction Mats

When frictions mats are used as a securement device for paper rolls or for other cargo, how large a friction mat is required underneath the cargo to provide adequate restraint (Section 6 (1) and Section 60)?

Comments: The standard does not specify the size or shape of friction mats required (although the mat must be visible in the direction that restraint is being provided). (Manufacturer's instructions should be consulted.)

7. Tarping

When using a tarp or other similar material to contain the cargo in a vehicle or load container, is the covering required to extend the full length of the vehicle?

Comments: The cargo securement standard requires a load to be secured and contained to prevent it from leaking, spilling, blowing off, falling through or otherwise becoming dislodged from the vehicle. If a covering is being used for containment and does not cover the entire length of the vehicle, but does cover the article of cargo, thereby preventing it from being dislodged from the vehicle, the requirement of containment has been satisfied. However, if the article of cargo or tarp has moved while in transit and is no longer contained by the means of the covering, then the requirement of containment has not been satisfied. In this situation the driver's responsibility for inspection and making necessary adjustments to the securement system under Section 3 Part 1 Division 1 would be required.

8. Securement of Chains and other Equipment

Can chains, load binders and other equipment be hung from racks or hooks on the vehicle?

Comments: Yes, provided they are firmly immobilized or secured on or within the vehicle by structures of adequate strength, blocking, bracing, dunnage or dunnage bags, shoring bars, tiedowns or a combination of these. Extra chain and securement equipment are considered to be cargo for the purposes of NSC Standard 10.

9. Hoses, Buckets and Other Equipment

Can auxiliary equipment (e.g., hoses, rakes, shovels, wheelbarrows) be secured using tarp straps as tiedowns?

Comments: Yes, provided it is firmly immobilized or secured on or within the vehicle by structures of adequate strength, blocking, bracing, dunnage or dunnage bags, shoring bars, tiedowns or a combination of these.

10. Securement of Spare Dunnage

Can spare dunnage be secured to landing gear or trailer cross members by tarp straps?

Comments: Yes, provided it is firmly immobilized or secured on or within the vehicle by structures of adequate strength, blocking, bracing, dunnage or dunnage bags, shoring bars, tiedowns or a combination of these.

11. Luggage Boxes

What is required to secure luggage boxes?

Comments: Luggage boxes must be secured in accordance with the general requirements (they are not considered to be Roll-on/Roll-off Containers).

Division 4 – Tiedowns

1. Working Load Limit - Tiedown

When determining the WLL of a tiedown (subsections 21(1)(b) and 21(2)(c)), if the anchor point where the tiedown is attached to the vehicle is not rated with a WLL, is the vehicle anchoring point considered the lowest or weakest WLL?

Comments: Anchor points are not currently required to be rated and marked. Consequently unmarked anchor points are considered to be as strong as the weakest link in the securement system (unless there are obvious defects that would place it out of service).

2. Default Working Load Limit - Chain

What is the default WLL for unmarked chain?

Comments:

The default WLL for unmarked chain is addressed in NSC Standard 10 as follows:

“Chain has a working load limit equal to that of the same size of Grade 3 Proof Coil under Part 3 section 1.” This means that an unmarked chain will be assigned a WLL for Grade 3 Proof Coil of the same diameter.

3. Working Load Limit of Wire Rope

What is the default working load limit of wire rope that has a diameter that is not listed in the tables in Part 3 (i.e., smaller than 7 mm (1/4 in) or larger than 25 mm (1 in))?

Comments: Wire rope which is not marked by the manufacturer with a working load limit shall be considered to have a working load limit equal to one-fourth of the nominal strength (breaking strength) listed in the Wire Rope Users Manual (www.domesticwirerope.org/wrtb/index.html). Wire rope which is not marked or labeled to enable identification of its construction type shall be considered to have a working load limit equal to that of 6 x 37, fiber core wire rope.

4. Rub Rails as Anchor Points

Can rub rails be used as an anchoring point?

Comments: Yes, if the tiedown is fitted with a flat hook end and it is not possible to attach the hook to another more suitable anchor point. However, best practices would have tiedowns routed inside the rub rail.

Example:



Division 5 – Front End Structures

1. Tiedowns as Blocking Devices

When a tiedown is being used at the front of the cargo to block cargo against forward movement, does the WLL of the tiedown have to be equal to the strength of the bulkhead strength described in subsection 25 (1) and/or 25 (2)?

Comments: No. The WLL of tiedowns used as blocking devices must be at least 50% of the weight of the cargo being blocked.

2. Front End Structure Rating

Who will determine Front End Structure Rating?

Comments: The manufacturer must determine the rating of the front end structure.

Part 2 – Commodity Specific Requirements

Division 1: Logs

1. Shortwood Logs - Aggregate WLL

Is the aggregate WLL for tiedowns required for shortwood logs loaded crosswise under sections 35, 36 and 37 the same as indicated in subsection 38 (3) for shortwood loaded lengthwise (1/6 of the weight of the stack)?

Comments: No, the “shortwood logs loaded crosswise” sections do not specifically mention a requirement for aggregate working load limit.

2. Shortwood Logs Crosswise – Division Into Two Sections

Subsection 37 (1) requires a vehicle that is more than 10 metres in length to be divided into two approximately equal sections. Is the 10 metre length inclusive of the whole vehicle including the cab, or is it just the length of the cargo carrying surface?

Comments: The 10 metre length is intended to refer to the length of the cargo carrying surface of the vehicle. If the transporting vehicle consists of one or two semi-trailers, each semi-trailer would be taken into consideration separately.

3. Logs on Pole Trailers - Aggregate WLL

When transporting logs on a pole trailer what is the required aggregate WLL of the tiedowns or wrappers required under subsection 40(2)?

Comments: The “logs loaded on a pole trailer” section does not specifically mention a requirement for a minimum aggregate working load limit. The tiedowns are being used as wrappers, and are not required to be attached to the vehicle.

4. Longwood Loaded Lengthwise - Aggregate WLL

What is the required minimum aggregate WLL for tiedowns used to secure longwood loaded lengthwise? (Section 39)

Comments: Section 39(1) (2) (3) under the “longwood loaded lengthwise” section requires that tiedowns provide a minimum aggregate working load limit of 1/6 the weight of the stack. Section 40 refers to pole trailer applications and makes no mention.

5. Longwood Loaded Lengthwise – Minimum Number of Tiedowns Required

Subsection 39 (1) indicates that a stack of longwood loaded lengthwise shall be secured by 2 or more tiedowns. Subsection 39 (3) states the outside logs of a stack of longwood shall be secured by 2 or more tiedowns. As it appears both these subsections state the same intent, does this mean 4 tiedowns are required?

Comments: Not necessarily. While a minimum of two tiedowns are required per stack, additional tiedowns may be required to ensure that each log on the outside of a stack is secured by at least two tiedowns (e.g., if the lengths of the logs on the outside of the stack vary).

6. Frame Semi-trailers (e.g., “Hay Rack”)

How must longwood logs be secured on frame (or “hay rack”) semi-trailers?

Comments: For the purposes of cargo securement and NSC Standard 10, hay rack semi-trailers are considered to be pole trailers.



7. Can longwood and shortwood be transported together?

Comments: Yes. A stack of logs that contains both shortwood and longwood should be secured in accordance with the requirements for stacks of shortwood. In cases where the shortwood is securely embedded in a load of longwood, the securement procedures for longwood can be followed (at least two tiedowns per stack, with all logs on the outside of the stack secured by at least two tiedowns).

Division 2: Dressed Lumber and Similar Building Products

1. Dressed Lumber - Length of Spacers

Can 2 four-foot spacers be used across the trailer to support two bundles (one from each side)? (Section 46 (2))

Comments: Yes, as long as they provide support to all pieces in the bottom row of each of the bundles.

2. Bundles of Shingles

Shingles are unitized building products; should the dressed lumber section apply?

Comments: No, the general securement provisions under Part 1 apply.

3. Non-unitized Building Products

In cases where building products such as dressed lumber, drywall or plywood are not unitized in bundles, what section of the NSC Standard applies?

Comments: It would generally be preferable and more effective to secure stacks of drywall and plywood using the procedures required for unitized bundles, but the general securement provisions under Part 1 can also be used.

4. Dressed Lumber, Plywood and Drywall in Enclosed Trailers

What are the requirements for securing plywood, drywall and other similar building products in enclosed trucks or van trailers?

Comments: Plywood, drywall and similar building materials can be transported in enclosed trucks or trailers using either:

- the general securement requirements of Part 1 (ie. firmly immobilized or secured on or within the vehicle by structures of adequate strength, blocking, bracing, dunnage or dunnage bags, shoring bars, tiedowns or a combination of these) or
- the commodity specific requirements of Part 2 – Division 2 (where possible).

Division 3: Metal Coils

1. Coil Bunks

When coil bunks are used to immobilize metal coils, and the coil is properly secured with chains, does the coil bunk have to be secured (e.g., chained or strapped) in place as well?

Comments:

No. However, it may be desirable to do so, especially under low friction conditions.

2. Friction Mats:

Where should friction mats be placed when transporting metal coils in bunks? (On top of the cradle or below it?)

Comments: Both locations have merit. Mats placed between the cradle and the coil will resist sliding of the coil within the bunk. Mats placed between the cradle and the deck will resist sliding of the cradle on the vehicle.

Friction mat must be placed to immobilize the cradle where the mat is used as “equivalent means” to blocking.

3. Tiedowns as Blocking Devices

What is required to ensure that tiedowns which loop around the front or rear of coils (Section 49 - eyes vertical) will remain in place and don’t slide downwards on the face of the coil? (possibly ending up resting on the deck of the vehicle)

Comments: There are no specific measures called for in the NSC Standard.

4. Rows of Coils:

What is the definition of a “row of coils” as stated from Section 55 onwards?

Comments: More than one coil constitutes a “row of coils.”

5. Nailed Wood Blocking:

Does the prohibition against using “Nailed Wood Blocking” (Section 56) for securement apply to all types of cradles used to secure metal coils?

Comments: Yes.

Section 56 - The use of nailed wood blocking or cleats as the sole means to secure timbers, chocks or wedges, or a nailed wood cradle is prohibited when metal coils are transported with eyes lengthwise or eyes crosswise by a vehicle or an intermodal container with anchor points.

6. Wood Blocking

Section 56 prohibits the use of “nailed wood blocking” as the sole means of securement of metal coils. However, would it be acceptable if the wood blocking is screwed or bolted to the surface of the deck of the vehicle? (Conceivably, a hardwood piece 8 inch x 8 inch that is bolted through the deck would be a well anchored blocking device, and possess the strength required to secure the coil.)

Comments: Yes, provided all other requirements are met.

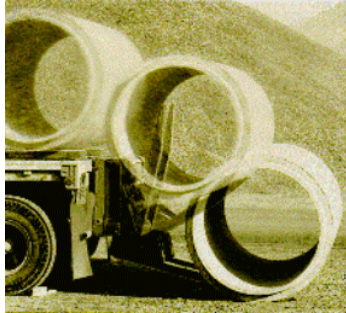
Division 4: Paper Rolls

Division 5: Concrete Pipe

1. Locked Pipe Unloader

What is a locked pipe unloader?

Comments: A concrete pipe unloader is a structure (two stakes) at the rear of the vehicle or trailer which lock in place vertically to form a bulkhead, and which can be used to lower the pipe to the ground (air or hydraulically activated):



2. Different Diameter Pipes

Section 76 of the NSC Standard indicates that pipe of different diameters must be loaded and secured separately. However, would it be permissible to prepare a bottom tier of larger diameter pipe, and a second tier of smaller diameter pipe that fits snugly into those wells?

Comments: No – the standard requires that pipe of different diameters be separated into groups of the same size pipe and each group secured separately.

3. Different Diameter Pipes

May a smaller diameter concrete pipe be loaded within a larger diameter pipe?

Comments: No – the standard requires that pipe of different diameters be separated into groups of the same size pipe and each group secured separately

4. Longitudinal Tiedowns

Is a longitudinal tiedown required over a single layer of small pipe, in addition to the tiedowns required to secure the front & rear pipes in the layer (Section 79)?

Comments: Yes, there is a requirement for a lengthwise chain or wire rope as per 80 (3) (a) of the standard when each pipe is not secured individually.

5. Transverse Tiedowns

Subsection 80(3)(b) states that a transverse tiedown is required every 3.04 metres. If a load measured 9.0 metres how many transverse tiedowns would be required?

Comments: Subsection 80 (3) (b) requires 1 transverse tiedown for every 3.04 metres, so for a load 9 metres long a minimum of two tiedowns would be required.

6. Tiedowns:

Are chains the only tiedown allowed for concrete pipe, or can concrete pipe be secured individually with synthetic webbing (straps)?

Comments: NSC Standard 10 does not prohibit the use of transverse tiedowns (used through or over pipe) made from synthetic webbing or other materials. However, longitudinal tiedowns (used over the top of a row or rows) must be wire rope or chain.

Division 6: Intermodal Containers

1. Synthetic Web Tiedowns

Division 6 Part 2 subsection 85 (3) states a loaded intermodal container shall be secured by chains, wire rope or integral locking devices. When transporting an empty intermodal container in compliance with subsection 86 (5) (b) can synthetic webbing tiedowns be used?

Comments: Yes, provided the minimum Aggregate Working Load Limit for tiedowns is met.

2. Integral Locking Device

Can a chain be used as an “integral locking device”? (Section 84(2))

Comments: While a chain is not considered to be an integral locking device, it can be used as a temporary tiedown to replace a defective or broken integral locking device on a container chassis to allow the trip to be completed and the integral locking device to be repaired.

3. Tiedowns on Loaded Intermodal Containers:

If the 4 chains attached to the corners of the container do not add up to an aggregate WLL of 50% of the weight of the container, may synthetic web straps be added over the body of the container and attached to the frame of the vehicle to provide the necessary additional WLL?

Comments: No, the aggregate WLL of the chains and/or wire rope attached to the corners must be at least 50% of the weight of the container.

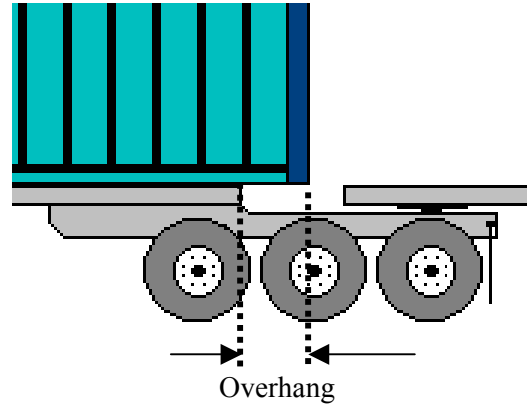
4. Attachment Points on Containers

Some intermodal containers are designed with the securement points (pin locks) not at the extreme corners of that container. Sec 85(2) states that the tiedown devices must be secured to the “corners.” Is the industry being advised that these types of containers must now be retrofitted to comply?

Comments: There is no requirement to secure the container on the extreme corners in Section 85 (2); attachment to the designed and designated securement points on the container is acceptable.

5. Overhang on Empty Intermodal Containers

NSC Standard 10 (section 86 (3)(b) indicates that an empty container cannot “overhang either the front or rear of the vehicle by more than 1.5 metres”. For containers which overhang the rear of the lead semitrailer on a B Train, where is this measurement taken?



Comments: The overhang is measured from the rear of the deck or cargo carrying area of the lead semitrailer on B Trains (not from the extended frame which supports the fifth wheel).

Division 7: Vehicles as Cargo

1. Light Vehicles

If a light vehicle is transported inside an enclosed vehicle, must the vehicle be secured as outlined in section 88, or can the vehicle be secured by other means such as blocking, bracing, void fillers etc?

Comments: Securement of vehicles must follow the applicable provisions of section 88.

2. Winch as a Tiedown:

May a winch be considered as a tiedown (front tiedown) as per Section 88(2)?

Comments: Yes, it can be considered as part of the securement system. However NSC Standard 10 requires the vehicle to be restrained (at both the front and rear) from moving sideways, forward, rearward and vertically using a minimum of 2 tiedowns.

3. Light Vehicles – Minimum Number of Tiedowns

Does securement of light vehicles whose length is greater than 3.04 m require additional tiedowns (as per Section 22)?

Comments: No, section 22 does not apply.

4. Heavy Vehicles - Tiedowns

Is it acceptable for one of the four chains that secures the heavy vehicle itself (Sec 89(4) of the Standard) to also be used to secure some of the accessory equipment (stated in Sec 89(2))?

An illustration: one chain may be anchored onto the vehicle properly, then applied and then tightened to an anchor point on the side/deck of the trailer. There is still more of that same chain not being utilized – may the rest of this chain now be used to stretch across some of this accessory equipment (still attached at the original anchor point) and this end is re-attached on the opposite side?

Comments: Yes, provided it is properly anchored.

5. Parts Removed From Heavy Vehicles

Must a blade from a bulldozer or similar piece of equipment be included in the heavy vehicle division requirement to be secured to the transporting vehicle?

Comments: No, must meet the general provisions for cargo securement.

6. Tracks as Anchor Points

Can the rubber or steel tracks on heavy vehicles be used as an anchor point?

Comments: The standard does not specifically prohibit the use of tracks as an anchor points, however, the manufacturer should be consulted to ensure that it would be acceptable and in compliance with the standard.

7. Pallet Jacks

Are pallet jacks required to be secured in accordance with the provisions of Division 7?



Comments: No, they can be secured in accordance with the general requirements of Part 1.

8. Crushed Cars with Integral Anchor Points:

Can the integral attachment points on crushed vehicles be used as anchor points for the tiedowns required under Section 92?

Comments: No.

9. Decked Trucks or Trailers:

Are trailers which are transported on other trailers (decked) required to be secured in accordance with the applicable provisions of Division 7?



Comments: Yes. It should be noted that the securement system depicted in the picture above does not comply with the requirements of Division 7.

10. Empty Log Trailers:

What is required to secure empty log trailers on tractors?



Comments: Where the trailer is mounted in a purpose built securement system on the tractor which provides restraint against forward, rearward and sideways movement, at least one tiedown is required to provide restraint in the vertical direction with an aggregate WLL no less than 20% of the weight of the trailer. In cases where the tractor is not equipped with an integral restraint system for the trailer, the trailer must be secured in accordance with the requirements of Part 2 – Division 7 (Vehicles as Cargo).

11. Securement of Heavy Articulated Equipment:

If a heavy articulated vehicle is equipped by the manufacturer with lock-out pins which are used to prevent articulation when the vehicle is being transported, would the lock-out pins be considered adequate to prevent articulation as required by subsection 89 (3)?

Comments: Yes. If the vehicle is not equipped with lock-out pins, articulation must be prevented by other means. Other means could include chains attached to both sides of the articulation point (direct tie-downs) and to the deck. Illustration's depicts an articulated vehicle secured with lock-out pins and the other with direct tie-downs.



Lock-out pin equipped



Direct Tie-downs

Division 8: Roll-on/Roll-off Containers

1. Securement System

Section 96(1) – Can the 2 Hooks (or equivalent mechanisms) stated in Subsection (C) (iii) AND the lifting device (winch) stated in Subsection (b) (i) be the same device?

Comments: No.

2. Rear Tiedown

Section 96(1) (c) (i) requires “one tiedown attached to both the vehicle chassis & the container.” May this one tiedown be attached to one rail on the vehicle chassis, or must the tiedown at the rear of the container attach at 2 separate points?

Comments: The tiedown must secure both sides of the container to the chassis.

3. Blocking

Section 96(1) (a) (ii) requires the container to be blocked against forward movement “by another restraint mechanism”. If the container is not blocked up to the back of the truck (blocked by structure), may this “other restraint” be a chain which secures the container against forward movement?

Comments: Yes.

4. Winches

Is the winch (lift mechanism) considered to be a load securement device/locking mechanism?

Comments: Yes, provided it restrains against vertical and sideways movement.

5. Transport on Tow Trucks

Can tilt deck trucks be used to transport Roll-on Roll-off Containers?

Comments: Yes, provided the requirements of section 96 are respected and adequate securement is used to prevent any horizontal and vertical movement.

Division 9: Large Boulders
