



LOG TRANSPORT
SAFETY COUNCIL

Log Load Securing Requirements

Version 2: December 2012

16 December 2012

The safe transport of logs is important to New Zealanders and the forest industry.

This Best Practice Guideline establishes a new level of workplace best practice in the securing of logs on truck and trailer units and includes the Loading Code of Practice issued by the New Zealand Transport Agency under section 134(4)(a) of the Land Transport Act 1998. It also sets out safe practices for the lifting and positioning of log trailers onto trucks, and for their safe and efficient return to the forest as part of the truck transport cycle approved by the Department of Labour.

For ease of use this Guideline has been written in a way that is easy to follow, and the Loading Code of Practice items are integrated with safe practice guidelines.

I am delighted that the Department of Labour, New Zealand Transport Agency and the Log Transport Safety Council have been able to work together to create this Guideline, and to make New Zealand roads safer for all New Zealanders.



Brett Murray

General Manager

High Hazards & Specialist Services

Ministry of Business Innovation &
Employment



Tom Logan

Manager Technical Support

Access & Use

New Zealand Transport Agency

Enforcement

The driver, and any other person loading the vehicle (including, for example, the loader operator) commits an offence if they fail to ensure that the load, or any part of that load on the truck or trailer, is secured and contained such that it cannot fall or escape from the vehicle.

If the load is not secure, the maximum fine an individual can pay is \$2,000, and the court may disqualify the person from holding or obtaining a driver licence.

The maximum fine for a company is \$10,000.

The court, when it considers what other matters could be taken into account, must consider any code of practice issued by NZTA and whether you followed the code of practice or not.

Responsibilities

The truck driver is the person with overall responsibility for the way the load is positioned and secured.

Loader operators must follow the instructions of the driver and must ensure that they can clearly see the driver or be aware of where the driver is at all times. This does not negate the general requirement for duty of care for everyone on site, including the loader operator and truck driver. They must take all practical steps to avoid imminent harm.

It is the vehicle owner's or operator's responsibility to ensure the vehicle meets the requirements of this Guideline and has a current NZ Transport Agency (NZTA) certifying engineer's Certificate stating that the vehicle (or relevant parts of it) has been designed and manufactured to the appropriate Land Transport Rules and other requirements.

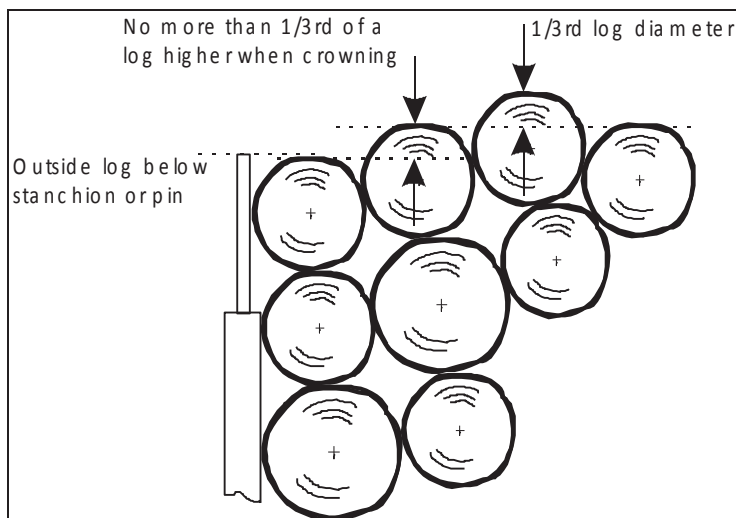
It is the responsibility of both designers and manufacturers to produce equipment capable of meeting the requirements of this Guideline and those specified by NZTA.

Investigations into improved load securing systems, including controlled in-service trials, may be approved by NZTA under the auspices of this Best Practice Guideline.

Loading

- If bolsters and stanchions are used to retain the load, there must be a minimum of two sets of bolsters and stanchions to contain each packet of logs.
 - Logs should be loaded so that the lower and outside logs extend past the front and rear bolsters and stanchions (side arms) by:
 - at least 150mm if the bolsters are attached to a fixed chassis on a truck or a trailer.
 - At least 300mm when transported on a pole trailer.
- for practical reasons, this condition is deemed to be met if:
- 80% of the outside and lower logs comply, and
 - all of the outside and lower logs extend past the bolsters and stanchions
- It is good practice to have as much overhang as possible at both ends and to have more overhang at the rear than the front.
 - Shorter logs must be cradled in the centre of the load by the outside and bottom layer of logs. They may be placed on the top of the load provided that one end of the logs meets the rear or front bolster overhang requirements.
 - No part of the outside logs may extend past the top of the stanchions or, if fitted, the stanchion extension pins.
 - Logs placed on the top of the load must be rounded or crowned so that the restraints will be in contact with as many logs as possible.

- Logs above the stanchions or extension pins must not be more than $\frac{1}{3}$ rd of their diameter at any point along their length above the adjacent log that is closer to the outside of the load. This is to ensure adequate crowning of small diameter logs. Whenever possible, all logs should be below the stanchions or extension pins.



Maximum permitted log heights with crowning

- At log landings it is permissible to move up to 100metres to a safe area away from the landing before securing the load.
- All communications must be clear and unambiguous when loading and unloading. To assist with this, a standard set of hand signs has been developed. Refer to the log transport standard on hand signals.
- Logs cannot be loaded higher than the SRT height limits.

SRT height measurement



- 1 **Start here.** Measure the highest end of the highest packet **1**
 - Is height **1** less than the SRT height? Yes → Load height is ok
 - If no, measure height of the other end of the packet **2**
 - Is average packet height $\left(\frac{\mathbf{1} + \mathbf{2}}{2}\right)$ less than the SRT height?
 - Yes → Load height is ok
 - No → Take logs off top
 - Is this a multiple packet load?
 - No → Take logs off top
 - Yes: measure height **3**
- 2 If yes, a **multiple packet load**, measure the highest end of the second highest packet **3**
 - Is **3** less than 1 metre lower than **1**? No → Take logs off top
 - Yes: measure height **4**
 - Is average height of both packets $\left(\frac{\mathbf{1} + \mathbf{2} + \mathbf{3} + \mathbf{4}}{4}\right)$ less than SRT height?
 - Yes → Load height is ok
 - No → Take logs off top
 - Is this a triple packet load?
 - No → Take logs off top
 - Yes: measure height **5**
- 3 If yes, a **triple packet load**, measure the highest end of the third highest packet **5**
 - Is **5** less than 1 metre lower than **1**? No → Take logs off top
 - Yes: measure height **6**
 - Is average height of all three packets $\left(\frac{\mathbf{1} + \mathbf{2} + \mathbf{3} + \mathbf{4}}{4}\right)$ less than SRT height?
 - Yes → Load height is ok
 - No → Take logs off top

Restraining the load

- The driver should only use the restraints, twitches and other fittings that are supplied and approved by the vehicle owner. The details on what restraints and fittings need to be fitted by the owner are detailed in the **Design, construction and repair** section of this Guideline.
- The lashing capacity of the chains as marked and the lashing capacity of wire ropes and other restraints must add up to more than $\frac{1}{4}$ of the weight of the packet being secured.
- The packet must be secured with a minimum of:
 - two 2.3tonne restraints with one placed forward of the rear bolster and the other as a belly restraint attached the chassis or:
 - two 3 tonne restraints, one attached to the rear and the other to the front bolsters or adjacent chassis.
- If the weight of a load means that two restraints do not provide sufficient lashing capacity, additional load restraint(s) must be used that have a lashing capacity of at least 2.3 tonne. When three restraints are required they must be near the rear and front bolsters and the middle of the packet.
- If the logs are eucalypt or have been mechanically peeled by a machine specifically designed for that purpose, at least three restraints are required. Logs that have been mechanically peeled have had all of their entire bark removed and often have spiral marks from the peeling process along the length of the logs.

- Shorter logs that are cradled in the centre of the load by the outside and bottom layer of logs must be secured by a bolster restraint and an additional restraint with a lashing capacity of at least 2.3 tonne that is positioned at least 300mm from the end of the shortest log.
- Top logs may be secured using 2 belly restraints with one placed at least 300mm forward of the rear of the top logs and the other 300mm behind the front of those logs.
- Any damaged or worn restraints, fittings or load binders must not be used.
- The vehicle must be swept down to remove loose stones and bark
- The restraints must be checked regularly to ensure they are tight. For enforcement purposes, the restraint must not be able to move more than 50mm when pulled by hand at approximately shoulder height at right angles to the direction of the restraint while standing on the ground.
- Restraints to be checked prior to entering the public highway system and re-tensioned if required.

Other operational requirements

- When loaded, bolsters that can slide along the chassis must be in the locked position when the vehicle is moving unless the bolster attachment design and certification explicitly does not require the locking of one of the bolsters in a bunk.

Design, construction and repair

This part of the Guideline explains what load securing equipment needs to be fitted on the vehicle for the driver's use.

It is for the securing of logs on purpose built heavy vehicles that are fitted with at least 2 bolsters for each packet of logs or slabs. The transport of sawn timber is outside of the scope of this Guideline.

Bolsters

- Bolster attachments must be certified to the Log Transport Safety Council bolster attachment code and the NZ Transport Agency NZ (NZTA) requirements.
- Replacement parts must be supplied by the original manufacturer, to the manufacturer's specifications, or they must be certified.
- Bolsters must have at least one raised edge on their upper surface no less than 10mm high and between 6mm and 20mm thick. An inverted angle is sufficient for this purpose.
- Bolsters that are required to rotate shall rotate on a spigot plate or turntable.
 - Spigot plate vertical play shall not exceed 10mm
 - Spigot horizontal play shall not exceed 6mm
 - Spigot depth shall be no less than 25mm
 - Bolster pivot pins shall be secured top and bottom

- If a bolster includes a drop riser, that drop riser must have a raised metal edge, and must be securely locked in position when it is supporting a load of logs.

Stanchions

- Stanchion extension pins shall be made of at least 50mm round steel bar of minimum grade 4140 steel (or equivalent)
- Stanchion extension pins shall:
 - Fit firmly into the stanchion
 - Extend into the stanchion at least 150mm
 - Be as near vertical as possible
- Stanchion extension pins shall not:
 - Exceed 450mm above the top of the stanchion
 - Exceed the vehicle width
- The distance between parallel faces of the stanchions shall vary at the top and bottom by no more than 50mm.
- A lift-off stanchion must have a securing device that can lock it in place in the base of the bolster.
 - Drop stanchions may be used only with load-restraint equipment capable of retaining the stanchion in an upright position if the belly strop fails. Wrap-round strops (or cradle strops) used with drop stanchions must:
 - consist of at least 19 mm diameter wire rope; and
 - be inspected every six months for the defects and, if necessary, replaced.

Load anchor points

Load anchor points may be attached to the chassis, bolster or stanchion. The anchor points must be below the top of the bolster bed unless chains with a lashing capacity of 3 tonne or more are being used, in which case the anchor points must be at least 300mm below the height of any load in contact with the stanchions. The load anchor point ratings must be certified and plated on the vehicle in accordance with NZS 5444.

Restraints

- The vehicle must be set up so that the driver has the correct equipment available to secure the load in accordance with this Guideline.
- The sum of the lashing capacity of the restraints securing a packet of logs must be at least $\frac{1}{4}$ of the weight of the packet in tonne.
- All restraint fittings, load binders, winches and other components must be of high quality and at least as strong as the restraints. The use of grab hooks reduces the strength of the chain and hence the assembly by 25%.
- The restraint must be attached to two anchor points capable of transferring the forces from the restraint to the vehicle unless it is a belly restraint.
- Belly restraints must be anchored to the chassis if restraints with a lashing capacity of less than 3 tonne are used.
- The rear anchor points must be within 500mm of the rear bolster.
- All packets must have at least two restraints that have a load path to the chassis in all three directions. This includes packets held by a sliding bolster which is not designed to be locked.

Sliding bolsters which are not designed to be locked and the load securing system associated with them must be designed and approved by a NZTA-authorized certifying engineer. All packets must be supported by at least two bolsters, one of which must be a fixed or lockable sliding bolster.

- All restraints, fittings, bolsters, stanchions, winches, twitches and other components of the load containment and securing system must be inspected on a regular basis, preferably as part of the driver's daily vehicle inspection.

Chains

- Chains must be short link and comply with:
- AS/NZS 4344:2001 Motor vehicles – Cargo restraint systems – Transport chain and components; or
- The manufacturer's rating for that chain.
- Chains that comply have their lashing capacity marked along their length.

Chain or other components used to secure loads must be replaced if there is:

- (a) A cracked weld or link in the chain or associated chain fittings or load binder attachments;
- (b) A noticeably bent, twisted, stretched or collapsed link;
- (c) A link weakened by gouges or pits reducing the diameter by 10% or more;
- (d) A repair or join in the chain made by repair links of a type other than those specified by the manufacturer;

- (e) A link visibly worn to 90% or less of its original diameter or showing other visible evidence of loss of strength;
- (f) A knot in any portion of the chain used in tension;
- (g) A spread or distorted grab hook.

Wire rope

- Wire ropes must conform to the requirements stipulated in the Truck Loading Code. The strength of the steel wire rope will depend on the quality of the steel used, the number of strands, the number of wires in each strand, the diameter of the rope and the method of construction.
- The ropes need to be inspected regularly as part of the driver's daily check to ensure that they are free from rust and there should be no broken wires or strands. Apart from the risk of injury to personnel from contact with broken wire strands, if 10 percent or more broken wires are visible in a rope length equivalent to 10 rope diameters, the rope is unsafe and should be condemned. There is a risk of unseen internal corrosion with steel wire rope and it can be easily damaged if driven over or bent around a sharp corner, etc.

Webbing restraints

Webbing restraints may only be used for trials that are approved by NZTA. In addition to any conditions that are imposed by NZTA:

- Webbing and their attachments must comply with AS/NZS 4380.

- The webbing straps must not show signs of damage, chafing, fraying, stitching failures or other damage as stipulated in the Truck Loading Code.
- The webbing must be at least 75mm wide.

Anchor points, bolsters, stanchions and other items

- Items that show evidence of loss of strength because of cracks, breaks, distortion or other deterioration must not be used for load securing until they have been repaired.

Trailer piggybacking

Trailers transported on a truck with cradles must be attached to the truck with chain as follows:

- (a) For chain placed over the trailer and attached to a load anchorage point on each side of the truck, the chain must have a combined lashing capacity equal to at least half the weight of the trailer;
- (b) For chain directly attached between the truck and trailer, the chain must have a combined lashing capacity equal to at least the weight of the trailer, and must be of a length that prevents the trailer wheels from rising over the axle guides on the truck;
- (c) For a trailer with one axle set, one axle must have steel side guides with a minimum height of 100 mm above the bottom of the trailer tyre;
- (d) For a trailer with two axle sets:
 - one axle must comply with (c); and

- the remaining axle set must have at least one axle having steel side guides with a minimum height of 50 mm above the bottom of the trailer tyre;
- (e) At least two axles must be secured by chocks or be positioned on the truck so that forward and backward movement of the trailer is restrained by fittings attached to the truck;
- (f) If the trailer axles straddle a bolster fitted to the truck, the bolster may be used as a cradle, to comply with the requirements of (e)

Rigid body vehicles

A vehicle with a rigid body used for transporting logs must not be loaded above the lowest height of the headboard, sideboards or the tailboard and must have a method of containing the logs so that no portion of the load becomes dislodged or falls from the vehicle.

Loads across deck (on vehicles without sideboards)

If a vehicle without sideboards is loaded across its deck with roundwood or logs that are not bound into bundles:

- (a) The vehicle must be fitted with a headboard with uprights of sufficient height and strength to retain the load if the logs are loaded to a height above the top of the headboard; and
- (b) Uprights or chock blocks of sufficient height and strength to ensure the safe releasing of the load restraints must be fitted at the rear of the vehicle; and
- (c) Two chain or wire rope load restraints with a lashing capacity of at least 3 tonne must be:
 - (i) Placed parallel to the longitudinal centre-line of the vehicle; and

- (ii) Tensioned tight across the logs, and
- (iii) Positioned approximately a third of the way across the load from each side of it so that the logs are bound into a tight bundle, and either:
 - (A) A tarpaulin or net must cover the load with across-the-deck lashings spaced not more than 3 m apart and placed and tightened over the cover; or
 - (B) Across-the-deck lashings spaced not more than 2m apart must be placed over both the load and the longitudinal restraints, and must have a load binder tightened on each side of the vehicle.

