# Heavy Vehicle Safety Initiative Final Report

## TURF TRANSPORT SAFETY GUIDELINES

PROJECT NUMBER HVSI 616

Turf Growers Association, NSW Inc.

Published date: 22nd April 2025

# Contents

# Acknowledgements


## Partners and Collaborators:

Turf Growers Association, NSW Inc (Turf NSW)

Engistics

Turf Australia

Turfco – Packaging and Tension testing site location and test materials

Southern Cross Turf –Tension testing site location and test materials

Greener Lawn Supplies – Blocking frame development and concept testing

# Grant Purpose and Objectives

## Project Description:

The Turf Growers Association of NSW (Turf NSW) proposed the deployment of a certified load restraint and mass management system to provide to the turf industry and its stakeholders. These systems will then be presented and communicated in awareness sessions to members of the turf industry.

The turf industry has a significant spread of Heavy Vehicle activity with a highly varied level of appreciation of the HVNL requirements and risk management approaches for both load restraint and mass management.

Through the delivery of the awareness sessions the key risks relating to the transportation of turf products will be explored and the participants provided with the key risks and management strategies to minimise these risks.

Key areas of risk control proposed to be explored are:

- ✓ Loaded vehicle mass management
- ✓ Load Restraint

The purpose of this project was to provide support and increase the knowledge of these risks within the industry and therefore reduce the risk exposed to all road users. This is further outlined below.

## Project Objectives:

Turf NSW were focused on delivering safety improvements for the industry, including Transport activities.

- ✓ Delivery of engineer certified load restraint system for Turf Products.
- ✓ Delivery of an engineered developed mass system for Turf Products that confirms relative load placement for various vehicle configurations.
- ✓ Delivery of face-to-face industry awareness sessions to rollout the systems.

## Expected Outcomes:

The key outcomes of the project are listed below

**Road Safety Benefits:**

- ✓ Reduction in load shift of Turf in transit.
- ✓ Reduction in partial loss of Turf products from Heavy Vehicles.
- ✓ Increase in skill levels of Drivers and Loaders for loading Turf products on heavy vehicles.

**Industry Benefits**

- ✓ Provision of compliant load restraint systems to a wide reach of industry participants in both Regional and Metro locations.
- ✓ Improved and common understanding of Load Restraint risk and systems between Loaders , Consignors, Consignees and Transport Providers.
- ✓ Common standard of restraint systems to allow easier measurement of compliance of received loads by Consignees and dispatched loads by Loaders.
- ✓ Common systems for Mass compliance in the industry in simple Driver Centric format.

**Regulator Benefits**

- ✓ Minimised likelihood of over Mass Vehicles on the network, with resulting reduction of infrastructure wear.
- ✓ Ability to verify restraint compliance during on-road enforcement activities using an engineer certified system. This allows increased levels of consistency in on road enforcement for load restraint.

# Summary of Project Activities

## Activities Completed:

The resources that have been produced as part of the project include:

- ✓ Delivery of an engineer certified load restraint system for Turf Products
- ✓ Delivery of an engineered developed mass system for Turf Products that confirms relative load placement for various vehicle configurations
- ✓ Delivery of face-to-face industry awareness sessions to rollout the systems, including recoding an online session for access once the program has finished.

## Supporting Documents:

*Include any relevant attachments, such as photographs, promotional materials, press coverage, or evaluation reports, that demonstrate the success of the project.*

Throughout the project there has been significant exposure to the industry both in NSW and across Australia. This has included meetings, workshops, newsletters and magazine articles.

**Newsletters and email promotion of the project work**

*November 2022*

NSW News

Turf NSW Grow Green

18 November 2022

TURF INDUSTRY SAFETY GUIDELINES FOR RESTRAINT OF TURF PRODUCTS

- DRAFT Guidelines Now Available -

The National Heavy Vehicle Regulator (NHVR) awarded Turf NSW with a Heavy Vehicle Safety Initiative funded project to ***develop safety guidelines that cover the restraint of turf products including packaging and mass and load distribution of turf products on various heavy vehicles***.

Turf NSW has been working with Engistics to:

(a) Develop Certified Restraint System for Turf products

(b) Develop a Mass Management System for Turf products

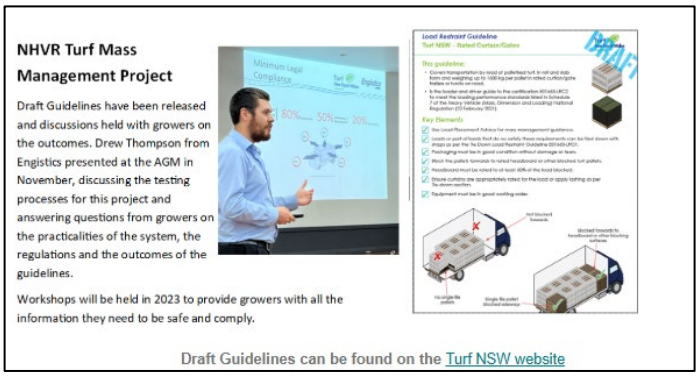
The DRAFT documents are now available for review and feedback from growers.

This information will be presented at the Turf NSW Grower Meeting on **Wednesday, 23rd November, 6pm** at Pitt Town Sports Club.

You can now review the information and provide feedback before the documents are finalised.

CLICK HERE FOR DRAFT DOCUMENTS

*December 2022*



**NHVR Turf Mass Management Project**

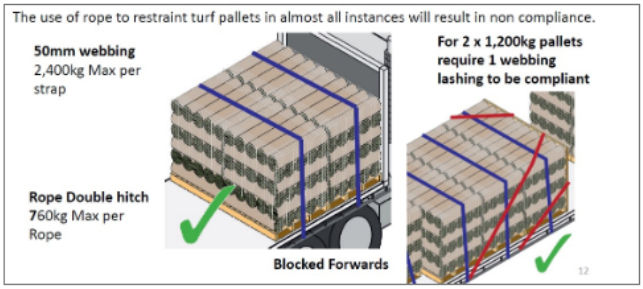
Draft Guidelines have been released and discussions held with growers on the outcomes. Drew Thompson from Engistics presented at the AGM in November, discussing the testing processes for this project and answering questions from growers on the practicalities of the system, the regulations and the outcomes of the guidelines.

Workshops will be held in 2023 to provide growers with all the information they need to be safe and comply.

Draft Guidelines can be found on the Turf NSW website

*January 2023*

**NHVR Turf Industry Mass Management Project**




The final stages of completing the Industry Guidelines are underway. Whilst this process has created some strong discussion and debate, these guidelines will bring the industry in line with current regulations and compliance.

Once the guidelines have been signed off by the industry and NHVR, there will be workshops held to provide information for growers and staff who are responsible for loading and delivery.

**Draft Guidelines and more information can be found on the Turf NSW website.**

*January 2024*

**Turf Load Restraint Guidelines Training Workshop**

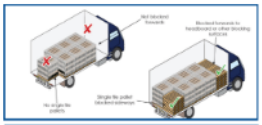
**Hawkesbury: Tues, 20th Feb 2024**
Lynwood Country Club, 9am - 1pm.
Pitt Town.

**North Coast: Tues, 12th March 2024**
Club Maitland City, 9.30am - 1.30pm
Rutherford.

Turf Industry Guidelines for Load Restraint has been developed through a National Heavy Vehicle Regulator (NHVR) project. The Guidelines have been developed by Engistics following consultation with growers and extensive testing. Anyone involved in loading, delivering or managing a turf business is invited to attend a training workshop.

The safety of our industry is vital, and these guidelines will bring the turf industry up to national standards for transport.

Cost: Free for Members. $100 Non Members.



HAWKESBURY WORKSHOP BOOKING

NORTH COAST WORKSHOP BOOKING

**All Event Information can be found HERE**

*February 2024*

**Turf Load Restraint Guidelines Workshop**

The first Turf Load Restraint Workshop was held in Sydney last week.
We have another one scheduled for the Hunter Area on **12th March** so please book now if you want to be sure you are up to date with the best techniques and safety for transporting your turf.

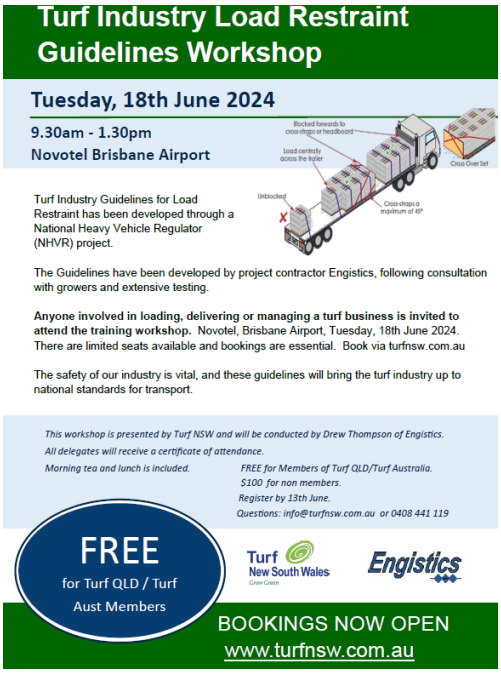
BOOK NOW

NEXT EVENT
Hunter Area - Tuesday, 12th March 2024
Club Maitland City, 9.30am - 1.30pm
Rutherford.

**FREE for Members.** $100 Non Members.

**All Event Information can be found HERE**

*Workshop promotion for Brisbane and Melbourne*





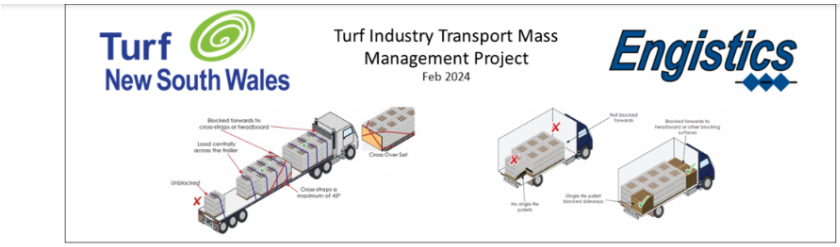
**Industry Resources**

A designated page has been established on the Turf NSW Website to host all project outcomes including all documents and training videos, with free access.

Engaging with growers at workshops is always challenging, depending on the time of year and other work pressures, so it was considered beneficial to develop online training opportunities for all growers, where they can watch videos at their own pace and during a time that was convenience to them. This also provided the opportunity to ensure more staff within a business could receive training.

Web Page Link: [Turf Mass Management - Turf New South Wales]

*Webpage images*




## Turf Industry Mass Management Guidelines

The National Heavy Vehicle Regulator (NHVR) awarded Turf NSW with a Heavy Vehicle Safety Initiative funded project to develop safety guidelines that cover the restraint of the turf products including packaging and mass and load distribution on various heavy vehicles.
Turf NSW contracted and worked with Engistics to develop:

(a) Certified Restraint System for Turf products
(b) Mass Management System for Turf products.

Safety is priority for all turf producers and the industry as a whole. This system supports growers to train staff in the recommended guidelines for turf mass management.
Below are Training Videos, Guidelines and supporting documents to keep your business safe and up to date.

## Guidelines and Certification

| | |
|---|---|
| Load Restraint Guidelines – Tie Down | Load Restraint Guidelines – Rated Curtain/Gates |
| Certification – Tie Down | Certification – Rated Curtain/Gates |

## Training Videos


### Chain of Responsibility Training Video

Watch Now


### Load Restraint Fundamentals Training Video

Watch Now

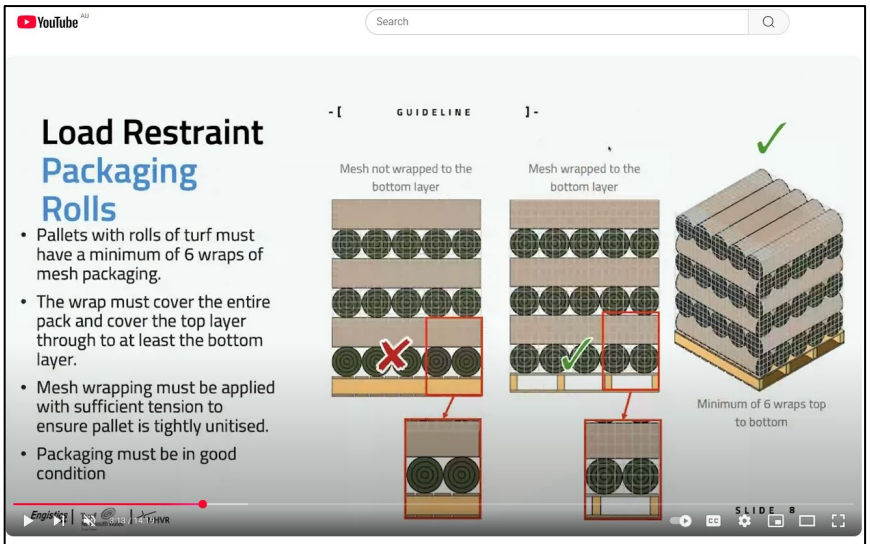

### Turf Mass Load Restraint Guidelines Training Video

Watch Now

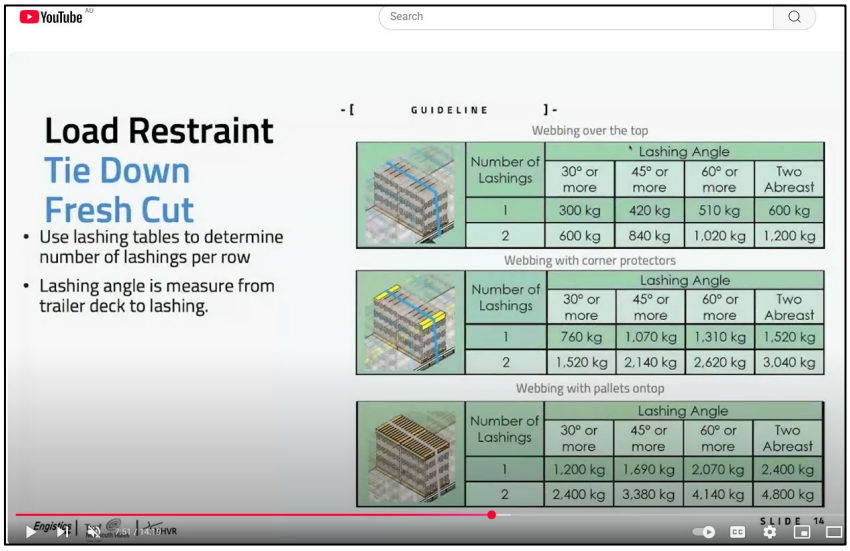
## Supporting Documents

| | | | | |
|---|---|---|---|---|
| Single Rigid Load Placement Advice | Dual Rigid Load Placement Advice | Semi-Trailer Load Placement Advice | B Double Load Placement Advice | Dual Steer Rigid Load Placement Advice |

*Image of training videos on the Turf NSW Website and loaded to YouTube*



TURF - Mass Load Restraint Guidelines Training - Part 3



*Turf Australia Magazine article from Darwin presentation – July 2024 National Publication*

TurfConnect INDUSTRY MAGAZINE • WINTER 2024

## DAY 3 : FIELD DAY & FAREWELL DINNER

**Drew Thompson** *(above)* from Engistics provided a short presentation about the latest Turf Industry Load Restraint Guidelines. Engistics engineers, tests, certifies and documents efficient solutions in driver friendly diagrammatic guidelines.

Crashes involving heavy vehicles tend to be more serious due to size and weight. The New South Wales Department of Transport reports that about 20% of all road deaths involve heavy vehicles. Drew discussed the latest load restraint laws with delegates and did a demonstration and workshop to illustrate best practice.

**Neale Tweedie** and **Alex White** *(left to right above)*, Turf Australia Board members, addressed delegates next. Neale discussed the development and capabilities of the Cost of Production calculators developed as part of the Early Needs Recovery Project (the extension of which is a deliverable under the TIDE Project), and Alex introduced a new subscription initiative as an extension to Toolbox Talks.

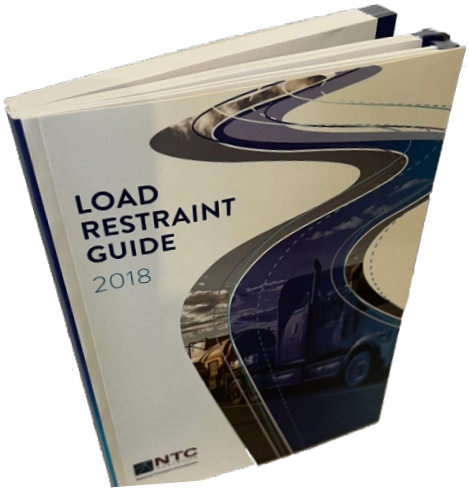
*For more information about the Toolbox Talk Subscriptions email admin@turfaustralia.com.au.*

*The Field Day was closed by* **Bec Sellick**, *Turf Australia Chair, and the group was taken by bus to Turf NT's compost pile, where Gav Howie described his sustainable composting process. This inspired several growers who implemented some of Gav's practices on their own farms. Lawn Doctor and Greenacres Turf Supplies both proudly showing off their efforts on Facebook in the weeks post conference.*

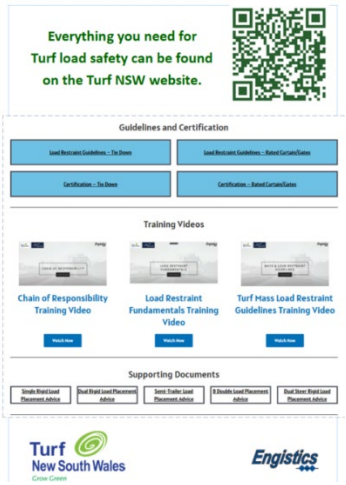
LEARN SHARE & ENJOY!

Display of project material at Turf NSW Event, August 2024


Turf NSW purchased and mailed out copies of the Load Restraint Guide, 2018 to all Turf NSW members. This included a document to explain the project and where to find more information.








All attendees of the training workshops were provided a folder with all project guidelines and supporting documents, 9 documents in total. This allowed them to take the hard copies of the information back to their workplace and review it other staff members.

*Turf Australia Magazine – January 2025 (National publication)*



# Getting a grip on TURF INDUSTRY LOAD RESTRAINT GUIDELINES

The topic of load restraint has featured high on the agenda for Turf NSW in 2024 after being awarded a project to develop safety guidelines for the restraint of turf products by the **National Heavy Vehicle Regulator (NHVR).**

The project covered the restraint of packaging, mass- and load distribution on various heavy vehicles. Turf NSW, funded by the **Heavy Vehicle Safety Initiative (HVSI)**, engaged and collaborated with Engistics to develop certified restraint- and mass management systems specific to the needs of the turf industry.

The project included the development of a restraint manual ('load restraint guide') and targeted training sessions in group settings and one-on-one on-farm formats.

As this project comes to an end, we sat down with **Drew Tompson from Engistics** (left) to discuss some of the most common mistakes he encounters, the most commonly asked questions and a run-down of resources and training available to growers on the topic...

**Q. What are some of the most common mistakes you see on farms?**

"The most common thing you see out in the industry is the reliance on the 2.5t rating of the webbing lashing to hold down 2.5t of load weight, relying on low friction surfaces (steel on steel) for a tie-down restraint system, and gaps to the front of a headboard and relying on it to stop the load from moving forward.

With direct restraint of equipment, we see a lot of mobile plant (like excavators) being restrained with chains that won't apply a direct stopping force in all directions to prevent movement."

**Q. What are some of the questions most commonly asked during your training sessions and demonstrations?**

"We are always asked how to reduce the amount of lashing needed; and who can be liable to a transport task if the grower doesn't touch the truck or load.

Regarding the number of lashings required: This is based on several influencing factors – especially in a restraint system such as tie down. By changing these factors, we can reduce the number of lashings required. First (if possible) block it to the headboard, then try to increase the friction between the load and/or the load and truck deck. Then try to increase the force pushing the load into the deck by using a higher tensioning device like a high pretension ratchet or increasing the lashing angle.



***"We are proud of the work undertaken in this project to support the turf industry. The engagement from growers across the country has been incredibly encouraging, reflecting their commitment to reviewing and improving operations within their businesses. The Guidelines have been developed to support growers in enhancing farm safety, and we strongly encourage all growers to utilise the resources provided. Ultimately, our goal is simple yet vital: to ensure that all turf production workers and contractors return home safely at the end of each day."***

*Jenny Zadro, Executive Officer, Turf Growers Association of NSW (Turf NSW)*

When it comes to liability: Depending on your actions or inactions you may have an influence on the transport task (such as setting delivery and pick up times) and therefore you could be liable under the chain of responsibility. If you are organising the truck to pick up or deliver the load, then you have an obligation under the heavy vehicle national law to ensure it is completed safely."

**Q. Could you recommend a list of the best resources for growers to review and keep on hand?**

"The best thing a grower can use for a good amount of information about all types of loads is the **National Transport Commission Load Restraint Guide** – particularly the **tie-down table** (see following pages). This table can be used to determine if any type of tie-down restraint system meets the on-road requirements."

**Q. Are any training sessions coming soon?**

"Yes, we have added some dates to our in-depth load restraint training schedule, covering all aspects of load restraint. We can also run in-house sessions on-farm focusing on the chain of responsibility and load restraint fundamentals with key reference to the developed system and turf products.

*A library of guideline and certification resources, as well as training videos can be found on the Turf NSW website: www.turfnsw.com.au/?page_id=3588*

## TRAINING COURSES & RESOURCES

To book an **Engistics training course** or to access the **Turf NSW load restraint resource library**, scan the following QR codes:

**Turf NSW Load Restraint Resources Library**

**Engistics Course Registration & Contact page**

**Upcoming 2025 course dates for Engistics in-depth training:**

- Brisbane: 19 March
- Melbourne: 19 March
- Sydney: 1 April
- Newcastle: 2 April
- Perth: 9 April


TurfConnect INDUSTRY MAGAZINE • SUMMER 2024 - 2025



EXTRACT FROM: *National Transport Commission Load Restraint Guide, 2018*

## NUMBER OF TIE-DOWN LASHINGS

**50MM WEBBING STRAPS, PUSH-UP HAND RATCHET OR TRUCK WINCH**

| Lashings: | Tensioner: | Pre-tension: |
|---|---|---|
| 50 mm webbing straps | Push-up hand ratchet or truck winch | 300 kgf |

**UNBLOCKED (RESTRAINED TO 0.8 G)**

| | Number of lashings | Lashing angle (from horizontal) At least 75° AE > 0.95 | At least 60° AE > 0.85 | At least 45° AE > 0.70 | At least 30° AE > 0.50 | At least 15° AE > 0.25 |
|---|---|---|---|---|---|---|
| HIGH FRICTION | Static friction: 0.6 | Example: Rusty steel on timber or smooth steel on rubber load mat (not conveyer belt) | | | | |
| | 1 | 1,700 kg | 1,500 kg | 1,200 kg | 900 kg | 460 kg |
| | 2 | 3,400 kg | 3,100 kg | 2,500 kg | 1,800 kg | 930 kg |
| | 3 | 5,200 kg | 4,600 kg | 3,800 kg | 2,700 kg | 1,300 kg |
| | 4 | 6,900 kg | 6,200 kg | 5,000 kg | 3,600 kg | 1,800 kg |
| | 5 | 8,600 kg | 7,700 kg | 6,300 kg | 4,500 kg | 2,300 kg |
| | 6 | 10,000 kg | 9,300 kg | 7,600 kg | 5,400 kg | 2,700 kg |
| | 7 | 12,000 kg | 10,000 kg | 8,900 kg | 6,300 kg | 3,200 kg |
| | 8 | 13,000 kg | 12,000 kg | 10,000 kg | 7,200 kg | 3,700 kg |
| | 9 | 15,000 kg | 14,000 kg | 11,000 kg | 8,100 kg | 4,100 kg |
| | 10 | 17,000 kg | 15,000 kg | 12,000 kg | 9,000 kg | 4,600 kg |
| MEDIUM FRICTION | Static friction: 0.4 | Example: Smooth steel on timber | | | | |
| | 1 | 570 kg | 510 kg | 420 kg | 300 kg | 150 kg |
| | 2 | 1,100 kg | 1,000 kg | 840 kg | 600 kg | 310 kg |
| | 3 | 1,700 kg | 1,500 kg | 1,200 kg | 900 kg | 460 kg |
| | 4 | 2,300 kg | 2,000 kg | 1,600 kg | 1,200 kg | 620 kg |
| | 5 | 2,800 kg | 2,500 kg | 2,100 kg | 1,500 kg | 770 kg |
| | 6 | 3,400 kg | 3,100 kg | 2,500 kg | 1,800 kg | 930 kg |
| | 7 | 4,000 kg | 3,600 kg | 2,900 kg | 2,100 kg | 1,000 kg |
| | 8 | 4,600 kg | 4,100 kg | 3,300 kg | 2,400 kg | 1,200 kg |
| | 9 | 5,200 kg | 4,600 kg | 3,800 kg | 2,700 kg | 1,300 kg |
| | 10 | 5,700 kg | 5,100 kg | 4,200 kg | 3,000 kg | 1,500 kg |
| LOW FRICTION | Static friction: 0.25 | Example: Smooth steel on conveyer belt | | | | |
| | 1 | 260 kg | 230 kg | 190 kg | 130 kg | 70 kg |
| | 2 | 570 kg | 470 kg | 380 kg | 270 kg | 140 kg |
| | 3 | 790 kg | 700 kg | 570 kg | 400 kg | 210 kg |
| | 4 | 1,000 kg | 940 kg | 770 kg | 540 kg | 280 kg |
| | 5 | 1,100 kg | 1,100 kg | 960 kg | 680 kg | 350 kg |
| | 6 | 1,500 kg | 1,400 kg | 1,100 kg | 810 kg | 420 kg |
| | 7 | 1,800 kg | 1,600 kg | 1,300 kg | 950 kg | 490 kg |
| | 8 | 2,100 kg | 1,800 kg | 1,500 kg | 1,000 kg | 560 kg |
| | 9 | 2,100 kg | 2,100 kg | 1,700 kg | 1,200 kg | 630 kg |
| | 10 | 2,600 kg | 2,300 kg | 1,900 kg | 1,300 kg | 700 kg |
| VERY LOW FRICTION | Static friction: 0.2 | Example: Smooth steel on rusty steel | | | | |
| | 1 | 190 kg | 170 kg | 140 kg | 100 kg | 51 kg |
| | 2 | 380 kg | 340 kg | 280 kg | 200 kg | 100 kg |
| | 3 | 570 kg | 510 kg | 420 kg | 300 kg | 150 kg |
| | 4 | 770 kg | 690 kg | 560 kg | 400 kg | 200 kg |
| | 5 | 960 kg | 860 kg | 700 kg | 500 kg | 250 kg |
| | 6 | 1,100 kg | 1,000 kg | 840 kg | 600 kg | 310 kg |
| | 7 | 1,300 kg | 1,200 kg | 980 kg | 700 kg | 360 kg |
| | 8 | 1,500 kg | 1,300 kg | 1,100 kg | 800 kg | 410 kg |
| | 9 | 1,700 kg | 1,500 kg | 1,200 kg | 900 kg | 460 kg |
| | 10 | 1,900 kg | 1,700 kg | 1,400 kg | 1,000 kg | 510 kg |



EXTRACT FROM: *National Transport Commission Load Restraint Guide, 2018*

## NUMBER OF TIE-DOWN LASHINGS

**50MM WEBBING STRAPS, PUSH-UP HAND RATCHET OR TRUCK WINCH**

| Lashings: | Tensioner: | Pre-tension: |
|---|---|---|
| 50 mm webbing straps | Push-up hand ratchet or truck winch | 300 kgf |

**BLOCKED (RESTRAINED TO 0.5 G)**

| | Number of lashings | Lashing angle (from horizontal) At least 75° AE > 0.95 | At least 60° AE > 0.85 | At least 45° AE > 0.70 | At least 30° AE > 0.50 | At least 15° AE > 0.25 |
|---|---|---|---|---|---|---|
| HIGH FRICTION | Static friction: 0.6 | Example: Rusty steel on timber or smooth steel on rubber load mat (not conveyer belt) | | | | |
| | 1 | 2,800 kg | 2,500 kg | 2,100 kg | 1,500 kg | 770 kg |
| | 2 | 5,700 kg | 5,100 kg | 4,200 kg | 3,000 kg | 1,500 kg |
| | 3 | 8,600 kg | 7,700 kg | 6,300 kg | 4,500 kg | 2,300 kg |
| | 4 | 11,000 kg | 10,000 kg | 8,400 kg | 6,000 kg | 3,100 kg |
| | 5 | 14,000 kg | 12,000 kg | 10,000 kg | 7,500 kg | 3,800 kg |
| | 6 | 17,000 kg | 15,000 kg | 12,000 kg | 9,000 kg | 4,600 kg |
| | 7 | 20,000 kg | 18,000 kg | 14,000 kg | 10,000 kg | 5,400 kg |
| | 8 | 23,000 kg | 20,000 kg | 16,000 kg | 12,000 kg | 6,200 kg |
| | 9 | 26,000 kg | 23,000 kg | 19,000 kg | 13,000 kg | 6,900 kg |
| | 10 | 28,000 kg | 25,000 kg | 21,000 kg | 15,000 kg | 7,700 kg |
| MEDIUM FRICTION | Static friction: 0.4 | Example: Smooth steel on timber | | | | |
| | 1 | 2,300 kg | 2,000 kg | 1,600 kg | 1,200 kg | 620 kg |
| | 2 | 4,600 kg | 4,100 kg | 3,300 kg | 2,400 kg | 1,200 kg |
| | 3 | 6,900 kg | 6,200 kg | 5,000 kg | 3,600 kg | 1,800 kg |
| | 4 | 9,200 kg | 8,200 kg | 6,700 kg | 4,800 kg | 2,400 kg |
| | 5 | 11,000 kg | 10,000 kg | 8,400 kg | 6,000 kg | 3,100 kg |
| | 6 | 13,000 kg | 12,000 kg | 10,000 kg | 7,200 kg | 3,700 kg |
| | 7 | 16,000 kg | 14,000 kg | 11,000 kg | 8,400 kg | 4,300 kg |
| | 8 | 18,000 kg | 16,000 kg | 13,000 kg | 9,600 kg | 4,900 kg |
| | 9 | 20,000 kg | 18,000 kg | 15,000 kg | 10,000 kg | 5,500 kg |
| | 10 | 23,000 kg | 20,000 kg | 16,000 kg | 12,000 kg | 6,200 kg |
| LOW FRICTION | Static friction: 0.25 | Example: Smooth steel on conveyer belt | | | | |
| | 1 | 570 kg | 510 kg | 420 kg | 300 kg | 150 kg |
| | 2 | 1,100 kg | 1,000 kg | 840 kg | 600 kg | 310 kg |
| | 3 | 1,700 kg | 1,500 kg | 1,200 kg | 900 kg | 460 kg |
| | 4 | 2,300 kg | 2,000 kg | 1,600 kg | 1,200 kg | 620 kg |
| | 5 | 2,800 kg | 2,500 kg | 2,100 kg | 1,500 kg | 770 kg |
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| | 7 | 4,000 kg | 3,600 kg | 2,900 kg | 2,100 kg | 1,000 kg |
| | 8 | 4,600 kg | 4,100 kg | 3,300 kg | 2,400 kg | 1,200 kg |
| | 9 | 5,200 kg | 4,600 kg | 3,800 kg | 2,700 kg | 1,300 kg |
| | 10 | 5,700 kg | 5,100 kg | 4,200 kg | 3,000 kg | 1,500 kg |
| VERY LOW FRICTION | Static friction: 0.2 | Example: Smooth steel on rusty steel | | | | |
| | 1 | 380 kg | 340 kg | 280 kg | 200 kg | 100 kg |
| | 2 | 770 kg | 690 kg | 560 kg | 400 kg | 200 kg |
| | 3 | 1,100 kg | 1,000 kg | 840 kg | 600 kg | 310 kg |
| | 4 | 1,500 kg | 1,300 kg | 1,100 kg | 800 kg | 410 kg |
| | 5 | 1,900 kg | 1,700 kg | 1,400 kg | 1,000 kg | 510 kg |
| | 6 | 2,300 kg | 2,000 kg | 1,600 kg | 1,200 kg | 620 kg |
| | 7 | 2,700 kg | 2,400 kg | 1,900 kg | 1,400 kg | 720 kg |
| | 8 | 3,000 kg | 2,700 kg | 2,200 kg | 1,600 kg | 820 kg |
| | 9 | 3,400 kg | 3,100 kg | 2,500 kg | 1,800 kg | 930 kg |
| | 10 | 3,800 kg | 3,400 kg | 2,800 kg | 2,000 kg | 1,000 kg |

APPENDICES



[Link to Full magazine article](#) *(Pg 18-21)*

**Training Workshops** – below are photos from workshop training sessions held during 2024.

*Industry Meeting – November 2022. Drew Thompson, Engistics presenting the at the AGM.*


Project Training Workshops:

*Sydney Workshop – Pitt Town, February 2024*

*Newcastle Event, April 2024*

*Brisbane Event – July 2024*

*Turf Australia Conference – Darwin – May 2024*

*Presentation at Turfbreed Event – Windsor – August 2024*




## Timeline/Project Schedule:

*Provide a summary of the timeline, including any significant changes or delays in the schedule.*

| Key Activity | Timeline Date |
|---|---|
| Execute agreement | 01/12/2021 |
| Collect Survey Result on Heavy Vehicle Safety | 01/12/2021 |
| Commencement of both Stage 1 and Stage 2 | 1/01/2022 |
| Completion of Stage 1 | 28/02/2022 |
| Completion of Packaging Testing | 11/03/2022 |
| Completion of tension Testing | 16/06/2022 |
| Commencement of Stage 3 | 15/04/2022 |
| Completion of Stage 2 | 15/04/2022 |
| Completion of Stage 3 | 30/04/2022 |
| Commencement of Stage 4 | 01/05/2022 |
| Completion of tension Testing | 16/06/2022 |
| Stakeholder consultation | 23/11/2022 |
| Stakeholder consultation | 08/02/2023 |
| Delivery of Training Session - Sydney | 10/09/2024 |
| Delivery of Training Session - Newcastle | 10/09/2024 |
| Delivery of Information Session at Turf Australia National Conference (Turf NSW funded) | 22/05/2024 |
| Delivery of Training Session - Brisbane | 18/06/2024 |
| Delivery of Information Session at TurfBreed Conference, Windsor, Sydney. | 26/06/2024 |
| Delivery of Training Session - Melbourne | 10/09/2024 |
| Completion of Stage 4 | 06/01/2025 |

# Program Management

## Overall

*How was the project managed?*

Turf NSW managed the overall project and worked closely with contractor Engistics to develop the project. Regular project update meetings were held, as well as discussions and meetings with turf producers to review the project plans and progress.

## Risk Management

*What risks were identified during the project? How were these managed?*

Risks experienced during the program were managed through risk assessment with parties involved.

## Stakeholder Management

*Who was involved with the project?*

Turf NSW Board Members and other Turf producers offered their time to be involved in the development of the project to ensure strong industry representation.

*How were they engaged/ how did they contribute to the project?*

This project took a hands-on approach directly with the industry and Engistics worked closely with turf producers to ensure there was a strong understanding of the industry practices and challenges for transporting turf. Some key growers were involved in the early discovery stages of the project then more growers were engaged regularly to ensure the industry was well represented and could be adopted by all businesses regardless of their size or operations.

Engistics presented the project at industry events to talk directly with a range of growers at annual general meetings and board meetings and answered questions and discussed issues. This direct approach and feedback assisted in developing industry specific resolutions to ensure the processes were practical for turf delivery but still meet the safety needs and the strong consultation would assist in encouraging a good adoption of the program.

The training and awareness sessions provided strong opportunities for growers to learn about their obligations and the program and to talk through their specific requirements, and practical farm solutions.

Feedback from the training sessions was positive with 90% of responses confirmed that the training was relevant to their business.  Everyone who provided feedback acknowledged that they now had a better understanding of chain of responsibility legislation after the training course.

## Project Communications

*Detail the marketing and advertising activities that occurred*

*Did the project receive any awards or recognition?*

As detailed in the Supporting Documents section of this report, regular project updates and awareness was included in Turf NSW newsletters.

In addition, information was distributed through other state turf industry groups communications and direct grower contact.

The national body, Turf Australia, included a feature article on the final project outcomes.

*Link to Full magazine article (Pg 18-21)*

## Issues

*Discuss any barriers to completing the project milestones*

*Were there any delays? Did you require any project variations or timeframe extensions?*

This project experienced delays due to the significant floods in NSW that had devastating impacts on turf production businesses across the state, but particularly in the Hawkesbury where around 60-70% of NSW turf businesses are located. Some farms experienced 8 floods during 2020 – 2023.

The impact of the floods meant that many businesses were out of operation or had limited operations during this period and therefore it was very difficult to engage with them while they were in recovery phases.

In addition, peak production periods make it hard to encourage growers to be involved or engaged with training as they are working long hours.

These challenges resulting in delays in obtaining feedback on the draft guidelines, as well as undertaking the workshops.

# Achieved Outcomes and Impact

## What Was Achieved:

*Detail the project outcomes and how they align with the objectives and goals set at the start of the project. Include quantitative and qualitative data wherever possible, such as number of beneficiaries, program delivery, etc.*

The resources that have been produced as part of the project these include:

- ✓ Delivery of an engineer certified load restraint system for Turf Products
- ✓ Delivery of an engineered developed mass system for Turf Products that confirms relative load placement for various vehicle configurations
- ✓ Delivery of face-to-face industry awareness sessions to rollout the systems, including recording an online session for access once the program has finished.

Awareness sessions:

- Pitt Town, NSW
- Maitland, NSW
- Brisbane, QLD
- Darwin, NT
- Windsor, NSW
- Melbourne, VIC

## Impact:

*Describe the broader impact the project had, such as social, environmental, economic, or industry benefits. Were there any unexpected outcomes?*
*How has the project improved safety in the heavy vehicle industry? (Provide data/ evidence to demonstrate impacts)*

The systems developed allow growers to access a certified restraint system for their products which would generally be outside their budget to conduct the work required for the outcomes to be developed.

In review of the impact of the project and awareness of the industry, the following data was achieved:

- ✓ Awareness and review stage saw around 85 people engaged.
- ✓ Training Workshops held in 4 locations, Sydney, Newcastle, Brisbane and Melbourne with 48 people undertaking the training.
- ✓ Information sessions were held in Windsor and Darwin with 80 people attending.
- ✓ Total of 213 turf producers attending in-person training.
- ✓ The Online training program views show:
  - ✓ Part 1 CoR video x 57 views
  - ✓ Part 2 Load Restraint Fundamentals video x 47 views
  - ✓ Part 3 Turf Mass Load Restraint Guidelines training video x 64 videos
- ✓ It is estimated that engagement through awareness meetings, training workshops and information sessions as well as online training has reached around 40-45% of the industry.

The feedback from growers has been very positive and appreciative of the opportunity to undertake the training.

Timing of engagement is important for growers ideally during quiet times and not in peak season. This allows them to test their farm practices and put things in place.

Recognition of the quality of the training provided was still apparent in March 2025, when a grower who attended an information session mid 2024 had decided to invest in a full review of their transportation processes to ensure they are in line with the Guidelines – some 9 months after attending the event.

It is expected that this program will have ongoing impacts for the industry for years to come.

Precise impact hasn't been measured at this stage, but there have been several enquiries from Growers across the country, seeking information or contacts with Engistics to further develop business programs. Future assessments of the adoption will be undertaken at events and in communication and engagement with growers.

# Project Evaluation

## Project Success:

*Did you meet your expected outcomes/ objectives?*

The project met all outcomes outlined in the original submission including the mass management and restraint system, Load restraint training session and online recorded sessions.

## Lessons Learned:

*Discuss any challenges faced during the project and how they were addressed. Highlight any lessons learned that may be relevant for future projects or other industry organisations.*

*What worked well?*

The training sessions and engagement with growers provided the opportunity to explain why the systems are required and the engineering details to why certain condition are found within the systems.

*What didn't work well?*

Agreeance on the final restraint system.

*Why?*

Multiple parties within the turf production industry with different opinions and appetites to change their current restraint systems.

*What would you improve in the future? Identify any gaps or areas that require further work.*

Over width issue found with turf products.

# Sustainability and Future Plans

## Sustainability:

*Describe how the outcomes of the project will be sustained beyond the grant period. Will the project continue with other funding, be integrated into ongoing programs, or have long-term benefits?*

This project has been successful for the turf production industry. As turf production operations differ from many other agriculture or horticultural industries, particularly in transportation issues, having industry specific guidelines has been well received and supported.

At the time of writing this report, no further funding programs have been obtained.

The project outcomes will continue to be promoted across the industry nationally through state based and national communication programs.

## Next Steps:

*Outline any future steps planned, such as follow-up actions, scaling of the project, or continued industry engagement.*

Turf NSW will continue to promote the project with its growers and other growers nationally in conjunction with Turf Australia and the other state turf associations.

To keep growers engaged, the program will be promoted at events and in communications to ensure it remains at the forefront of grower operations.

The project information flyer will be included in a NSW members resource pack and provided at farm visits and workshops.

The website developed specifically for the project outcomes will remain on the Turf NSW website with easy access to the whole industry.

# Appendix 1: References and Related Documents

Project Outcome Links

**Guidelines:**

Load Restraint Guidelines – Tie Down

Certification – Tie Down

Load Restraint Guidelines – Rated Curtain / Gates

Certification – Rated Curtains

**Sporting Documents:**

Single Rigid Load Placement Advice

Dual Rigid Load Placement Advice

Semi-Trailer Load Placement Advice

B Double Load Placement Advice

Dual Steer Rigid Load Placement Advice

**Videos**

Video Part 1 – Chain of Responsibility

Video Part 2 – Load Restraint Fundamentals

Video Part 3 – Turf Mass Load Restraint Guidelines Training

**Publications**

Turf Australia magazine featured the project in their Summer 2024/25 national magazine.

*Link to Full magazine article* *(Pg 18-21, see next page)*

# Getting a grip on TURF INDUSTRY LOAD RESTRAINT GUIDELINES


The topic of load restraint has featured high on the agenda for Turf NSW in 2024 after being awarded a project to develop safety guidelines for the restraint of turf products by the **National Heavy Vehicle Regulator (NHVR)**.

The project covered the restraint of packaging, mass- and load distribution on various heavy vehicles. Turf NSW, funded by the **Heavy Vehicle Safety Initiative (HVSI)**, engaged and collaborated with Engistics to develop certified restraint- and mass management systems specific to the needs of the turf industry.

The project included the development of a restraint manual ('load restraint guide') and targeted training sessions in group settings and one-on-one on-farm formats.

As this project comes to an end, we sat down with **Drew Tompson from Engistics** (*left*) to discuss some of the most common mistakes he encounters, the most commonly asked questions and a run-down of resources and training available to growers on the topic…

**Q.** What are some of the most common mistakes you see on farms?

"The most common thing you see out in the industry is the reliance on the 2.5t rating of the webbing lashing to hold down 2.5t of load weight, relying on low friction surfaces (steel on steel) for a tie-down restraint system, and gaps to the front of a headboard and relying on it to stop the load from moving forward.

With direct restraint of equipment, we see a lot of mobile plant (like excavators) being restrained with chains that won't apply a direct stopping force in all directions to prevent movement."

**Q.** What are some of the questions most commonly asked during your training sessions and demonstrations?

"We are always asked how to reduce the amount of lashing needed; and who can be liable to a transport task if the grower doesn't touch the truck or load.

Regarding the number of lashings required: This is based on several influencing factors – especially in a restraint system such as tie down. By changing these factors, we can reduce the number of lashings required. First (if possible) block it to the headboard, then try to increase the friction between the load and/or the load and truck deck. Then try to increase the force pushing the load into the deck by using a higher tensioning device like a high pretension ratchet or increasing the lashing angle.

*"We are proud of the work undertaken in this project to support the turf industry. The engagement from growers across the country has been incredibly encouraging, reflecting their commitment to reviewing and improving operations within their businesses. The Guidelines have been developed to support growers in enhancing farm safety, and we strongly encourage all growers to utilise the resources provided. Ultimately, our goal is simple yet vital: to ensure that all turf production workers and contractors return home safely at the end of each day."*

*Jenny Zadro, Executive Officer,*
*Turf Growers Association of NSW (Turf NSW)*

When it comes to liability: Depending on your actions or inactions you may have an influence on the transport task (such as setting delivery and pick up times) and therefore you could be liable under the chain of responsibility. If you are organising the truck to pick up or deliver the load, then you have an obligation under the heavy vehicle national law to ensure it is completed safely."

**Q.** Could you recommend a list of the best resources for growers to review and keep on hand?

"The best thing a grower can use for a good amount of information about all types of loads is the **National Transport Commission Load Restraint Guide** - particularly the **tie-down table** (*see following pages*). This table can be used to determine if any type of tie-down restraint system meets the on-road requirements."

**Q.** Are any training sessions coming soon?

"Yes, we have added some dates to our in-depth load restraint training schedule, covering all aspects of load restraint. We can also run in-house sessions on-farm focusing on the chain of responsibility and load restraint fundamentals with key reference to the developed system and turf products.

*A library of guideline and certification resources, as well as training videos can be found on the Turf NSW website:*
*www.turfnsw.com.au/?page_id=3588*

## TRAINING COURSES & RESOURCES

To book an **Engistics training course** or to access the **Turf NSW load restraint resource library**, scan the following QR codes:

**Turf NSW Load Restraint Resources Library**

**Engistics Course Registration & Contact page**

### Upcoming 2025 course dates for Engistics in-depth training:

- Brisbane: 19 March
- Melbourne: 19 March
- Sydney: 1 April
- Newcastle: 2 April
- Perth: 9 April


APPENDICES

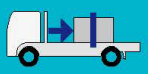
EXTRACT FROM: *National Transport Commission Load Restraint Guide, 2018*

# NUMBER OF TIE-DOWN LASHINGS

## 50MM WEBBING STRAPS, PUSH-UP HAND RATCHET OR TRUCK WINCH

| Lashings: | Tensioner: | Pre-tension: |
|---|---|---|
| 50 mm webbing straps | Push-up hand ratchet or truck winch | 300 kgf |

### UNBLOCKED
(RESTRAINED TO 0.8 G)



| | Number of lashings | Lashing angle (from horizontal) At least 75° AE > 0.95 | At least 60° AE > 0.85 | At least 45° AE > 0.70 | At least 30° AE > 0.50 | At least 15° AE > 0.25 |
|---|---|---|---|---|---|---|
| HIGH FRICTION | **Static friction:** 0.6 | | **Example:** Rusty steel on timber or smooth steel on rubber load mat (not conveyer belt) | | | |
| | 1 | 1,700 kg | 1,500 kg | 1,200 kg | 900 kg | 460 kg |
| | 2 | 3,400 kg | 3,100 kg | 2,500 kg | 1,800 kg | 930 kg |
| | 3 | 5,200 kg | 4,600 kg | 3,800 kg | 2,700 kg | 1,300 kg |
| | 4 | 6,900 kg | 6,200 kg | 5,000 kg | 3,600 kg | 1,800 kg |
| | 5 | 8,600 kg | 7,700 kg | 6,300 kg | 4,500 kg | 2,300 kg |
| | 6 | 10,000 kg | 9,300 kg | 7,600 kg | 5,400 kg | 2,700 kg |
| | 7 | 12,000 kg | 10,000 kg | 8,900 kg | 6,300 kg | 3,200 kg |
| | 8 | 13,000 kg | 12,000 kg | 10,000 kg | 7,200 kg | 3,700 kg |
| | 9 | 15,000 kg | 14,000 kg | 11,000 kg | 8,100 kg | 4,100 kg |
| | 10 | 17,000 kg | 15,000 kg | 12,000 kg | 9,000 kg | 4,600 kg |
| MEDIUM FRICTION | **Static friction:** 0.4 | | **Example:** Smooth steel on timber | | | |
| | 1 | 570 kg | 510 kg | 420 kg | 300 kg | 150 kg |
| | 2 | 1,100 kg | 1,000 kg | 840 kg | 600 kg | 310 kg |
| | 3 | 1,700 kg | 1,500 kg | 1,200 kg | 900 kg | 460 kg |
| | 4 | 2,300 kg | 2,000 kg | 1,600 kg | 1,200 kg | 620 kg |
| | 5 | 2,800 kg | 2,500 kg | 2,100 kg | 1,500 kg | 770 kg |
| | 6 | 3,400 kg | 3,100 kg | 2,500 kg | 1,800 kg | 930 kg |
| | 7 | 4,000 kg | 3,600 kg | 2,900 kg | 2,100 kg | 1,000 kg |
| | 8 | 4,600 kg | 4,100 kg | 3,300 kg | 2,400 kg | 1,200 kg |
| | 9 | 5,200 kg | 4,600 kg | 3,800 kg | 2,700 kg | 1,300 kg |
| | 10 | 5,700 kg | 5,100 kg | 4,200 kg | 3,000 kg | 1,500 kg |
| LOW FRICTION | **Static friction:** 0.25 | | **Example:** Smooth steel on conveyer belt | | | |
| | 1 | 260 kg | 230 kg | 190 kg | 130 kg | 70 kg |
| | 2 | 520 kg | 470 kg | 380 kg | 270 kg | 140 kg |
| | 3 | 790 kg | 700 kg | 570 kg | 400 kg | 210 kg |
| | 4 | 1,000 kg | 940 kg | 770 kg | 540 kg | 280 kg |
| | 5 | 1,300 kg | 1,100 kg | 960 kg | 680 kg | 350 kg |
| | 6 | 1,500 kg | 1,400 kg | 1,100 kg | 810 kg | 420 kg |
| | 7 | 1,800 kg | 1,600 kg | 1,300 kg | 950 kg | 490 kg |
| | 8 | 2,100 kg | 1,800 kg | 1,500 kg | 1,000 kg | 560 kg |
| | 9 | 2,300 kg | 2,100 kg | 1,700 kg | 1,200 kg | 630 kg |
| | 10 | 2,600 kg | 2,300 kg | 1,900 kg | 1,300 kg | 700 kg |
| VERY LOW FRICTION | **Static friction:** 0.2 | | **Example:** Smooth steel on rusty steel | | | |
| | 1 | 190 kg | 170 kg | 140 kg | 100 kg | 51 kg |
| | 2 | 380 kg | 340 kg | 280 kg | 200 kg | 100 kg |
| | 3 | 570 kg | 510 kg | 420 kg | 300 kg | 150 kg |
| | 4 | 770 kg | 690 kg | 560 kg | 400 kg | 200 kg |
| | 5 | 960 kg | 860 kg | 700 kg | 500 kg | 250 kg |
| | 6 | 1,100 kg | 1,000 kg | 840 kg | 600 kg | 310 kg |
| | 7 | 1,300 kg | 1,200 kg | 980 kg | 700 kg | 360 kg |
| | 8 | 1,500 kg | 1,300 kg | 1,100 kg | 800 kg | 410 kg |
| | 9 | 1,700 kg | 1,500 kg | 1,200 kg | 900 kg | 460 kg |
| | 10 | 1,900 kg | 1,700 kg | 1,400 kg | 1,000 kg | 510 kg |

EXTRACT FROM: *National Transport Commission Load Restraint Guide, 2018*

# NUMBER OF TIE-DOWN LASHINGS

## 50MM WEBBING STRAPS, PUSH-UP HAND RATCHET OR TRUCK WINCH

| Lashings: | Tensioner: | Pre-tension: |
|---|---|---|
| 50 mm webbing straps | Push-up hand ratchet or truck winch | 300 kgf |

**BLOCKED**
**(RESTRAINED TO 0.5 G)**

| | Number of lashings | Lashing angle (from horizontal) | | | | |
|---|---|---|---|---|---|---|
| | | At least 75° AE > 0.95 | At least 60° AE > 0.85 | At least 45° AE > 0.70 | At least 30° AE > 0.50 | At least 15° AE > 0.25 |
| HIGH FRICTION | **Static friction:** 0.6 | | **Example:** Rusty steel on timber or smooth steel on rubber load mat (not conveyer belt) | | | |
| | 1 | 2,800 kg | 2,500 kg | 2,100 kg | 1,500 kg | 770 kg |
| | 2 | 5,700 kg | 5,100 kg | 4,200 kg | 3,000 kg | 1,500 kg |
| | 3 | 8,600 kg | 7,700 kg | 6,300 kg | 4,500 kg | 2,300 kg |
| | 4 | 11,000 kg | 10,000 kg | 8,400 kg | 6,000 kg | 3,100 kg |
| | 5 | 14,000 kg | 12,000 kg | 10,000 kg | 7,500 kg | 3,800 kg |
| | 6 | 17,000 kg | 15,000 kg | 12,000 kg | 9,000 kg | 4,600 kg |
| | 7 | 20,000 kg | 18,000 kg | 14,000 kg | 10,000 kg | 5,400 kg |
| | 8 | 23,000 kg | 20,000 kg | 16,000 kg | 12,000 kg | 6,200 kg |
| | 9 | 26,000 kg | 23,000 kg | 19,000 kg | 13,000 kg | 6,900 kg |
| | 10 | 28,000 kg | 25,000 kg | 21,000 kg | 15,000 kg | 7,700 kg |
| MEDIUM FRICTION | **Static friction:** 0.4 | | **Example:** Smooth steel on timber | | | |
| | 1 | 2,300 kg | 2,000 kg | 1,600 kg | 1,200 kg | 620 kg |
| | 2 | 4,600 kg | 4,100 kg | 3,300 kg | 2,400 kg | 1,200 kg |
| | 3 | 6,900 kg | 6,200 kg | 5,000 kg | 3,600 kg | 1,800 kg |
| | 4 | 9,200 kg | 8,300 kg | 6,700 kg | 4,800 kg | 2,400 kg |
| | 5 | 11,000 kg | 10,000 kg | 8,400 kg | 6,000 kg | 3,100 kg |
| | 6 | 13,000 kg | 12,000 kg | 10,000 kg | 7,200 kg | 3,700 kg |
| | 7 | 16,000 kg | 14,000 kg | 11,000 kg | 8,400 kg | 4,300 kg |
| | 8 | 18,000 kg | 16,000 kg | 13,000 kg | 9,600 kg | 4,900 kg |
| | 9 | 20,000 kg | 18,000 kg | 15,000 kg | 10,000 kg | 5,500 kg |
| | 10 | 23,000 kg | 20,000 kg | 16,000 kg | 12,000 kg | 6,200 kg |
| LOW FRICTION | **Static friction:** 0.25 | | **Example:** Smooth steel on conveyer belt | | | |
| | 1 | 570 kg | 510 kg | 420 kg | 300 kg | 150 kg |
| | 2 | 1,100 kg | 1,000 kg | 840 kg | 600 kg | 310 kg |
| | 3 | 1,700 kg | 1,500 kg | 1,200 kg | 900 kg | 460 kg |
| | 4 | 2,300 kg | 2,000 kg | 1,600 kg | 1,200 kg | 620 kg |
| | 5 | 2,800 kg | 2,500 kg | 2,100 kg | 1,500 kg | 770 kg |
| | 6 | 3,400 kg | 3,100 kg | 2,500 kg | 1,800 kg | 930 kg |
| | 7 | 4,000 kg | 3,600 kg | 2,900 kg | 2,100 kg | 1,000 kg |
| | 8 | 4,600 kg | 4,100 kg | 3,300 kg | 2,400 kg | 1,200 kg |
| | 9 | 5,200 kg | 4,600 kg | 3,800 kg | 2,700 kg | 1,300 kg |
| | 10 | 5,700 kg | 5,100 kg | 4,200 kg | 3,000 kg | 1,500 kg |
| VERY LOW FRICTION | **Static friction:** 0.2 | | **Example:** Smooth steel on rusty steel | | | |
| | 1 | 380 kg | 340 kg | 280 kg | 200 kg | 100 kg |
| | 2 | 770 kg | 690 kg | 560 kg | 400 kg | 200 kg |
| | 3 | 1,100 kg | 1,000 kg | 840 kg | 600 kg | 310 kg |
| | 4 | 1,500 kg | 1,300 kg | 1,100 kg | 800 kg | 410 kg |
| | 5 | 1,900 kg | 1,700 kg | 1,400 kg | 1,000 kg | 510 kg |
| | 6 | 2,300 kg | 2,000 kg | 1,600 kg | 1,200 kg | 620 kg |
| | 7 | 2,700 kg | 2,400 kg | 1,900 kg | 1,400 kg | 720 kg |
| | 8 | 3,000 kg | 2,700 kg | 2,200 kg | 1,600 kg | 820 kg |
| | 9 | 3,400 kg | 3,100 kg | 2,500 kg | 1,800 kg | 930 kg |
| | 10 | 3,800 kg | 3,400 kg | 2,800 kg | 2,000 kg | 1,000 kg |