

AS 5340:2020



STANDARDS
Australia



Livestock loading/unloading ramps and forcing pens



AS 5340:2020

This Australian Standard® was prepared by SF-054, Safe Design of Livestock Ramps and Forcing Yards. It was approved on behalf of the Council of Standards Australia on 22 October 2020.

This Standard was published on 20 November 2020.

The following are represented on Committee SF-054:

- Australian Industry Group
- Australian Livestock & Property Agents Association
- Australian Livestock and Rural Transporters Association
- Australian Livestock Markets Association
- Australian Lot Feeders Association
- Australian Meat Industry Council
- Australian Trucking Association
- Cattle Council of Australia
- Royal Society for the Prevention of Cruelty to Animals
- Victorian Farmers Federation

This Standard was issued in draft form for comment as DR AS 5340:2020.

Keeping Standards up-to-date

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals, and new projects by visiting:

www.standards.org.au

ISBN 978 1 76113 026 7

Livestock loading/unloading ramps and forcing pens

First published as AS 5340:2020.

© Standards Australia Limited 2020

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Cth).

Preface

This Standard was prepared by the Standards Australia Committee SF-054, Safe Design of Livestock Ramps and Forcing Pens.

The objective of this Standard is to ensure the safety of personnel and livestock through separation of livestock and livestock handlers, and by the design, construction, maintenance, and use of forcing pens, and ramps.

This Standard reproduces content from *Guide for Safe Design of Livestock Loading Ramps and Forcing Yards*, June 2015, with permission of the Australian Livestock and Rural Transporters Association.

This Standard is not intended to discourage innovation. The use of alternative materials, designs, methods of assembly and procedures that either do not conform to the specific requirements of the Standard or are not mentioned in it, are not precluded, provided equivalent performance is demonstrated.

Illustrations in this Standard are provided as examples and are not intended to illustrate a particular design principle.

Contents

Preface	ii
Foreword	v
Section 1 Scope and general	1
1.1 Scope	1
1.2 Normative references	1
1.3 Terms and definitions	2
Section 2 Design	5
2.1 General	5
2.2 Vehicle access	6
2.2.1 General	6
2.2.2 Traffic flow	6
2.2.3 Approach	6
2.2.4 Ramp alignment with livestock crate	6
2.3 Ramp surfaces and angle	7
2.3.1 Ramp surfaces	7
2.3.2 Ramp angle	7
2.4 Ramps, height of sidewalls and internal width	7
2.5 Ramp side infills	7
2.6 Adjustable ramps	8
2.6.1 Prevention of ramp free-fall	8
2.7 Supports and structural integrity	8
2.8 Cattle crushes	8
2.9 Forcing pens	8
2.10 Gates, latches, hinges, and chains	9
2.10.1 General	9
2.10.2 Slam shut latches	9
2.10.3 Throw gates in forcing pens	9
2.10.4 Gate hinges	9
2.10.5 Chains	9
2.11 Guards	10
2.12 Headroom	10
2.13 Walkways, ladders, steps and platforms	10
2.14 End of ramp buffers, extensions, and bridging flaps	10
2.14.1 Bumpers and end of ramp buffers	10
2.14.2 Gap infills	10
2.14.3 Bridging flaps	10
2.15 Winches, and loadbearing fixing points	11
2.16 Personnel access	11
2.16.1 General access	11
2.16.2 Access to the livestock crate door pin	11
2.16.3 Ramp entry/exit gates	11
2.17 Signage	11
2.17.1 General	11
2.17.2 Site-specific	11
2.17.3 Adjustable ramps	11
2.18 Supporting infrastructure	12
2.19 Lighting	12
Section 3 Materials	13
3.1 General	13
3.2 Steel	13
3.3 Fasteners	13
3.4 Welding	13
3.5 Concrete	13

3.6	Weather resistance.....	13
Section 4	Maintenance	14
4.1	General.....	14
4.2	Lifting equipment and mechanical safety locks.....	14
Section 5	Health and safety.....	15
Section 6	Animal welfare.....	16
Appendix A	(informative) Suggested ramp designs.....	17
Appendix B	(informative) Risk management.....	18
Appendix C	(informative) Ramp infill positioning.....	35
Appendix D	(informative) Loading methods.....	36
Bibliography		37

Foreword

This Standard deals with the movement of livestock and the facilities used from the time livestock are drafted into forcing pens, traverse a loading ramp and enter a transport vehicle (or vice versa).

Australian Standards are voluntary. They do not include contractual, legal or statutory requirements. Voluntary Standards do not replace laws, with which standards users are understood to comply and which take precedence over the requirements of this Standard.

Users of this Standard are reminded that it has no legal authority in its own right, but may acquire legal standing in one or more of the following circumstances:

- (a) Adoption by a government or other authority having jurisdiction.
- (b) Adoption by a purchaser as the required standard of construction in a contract between parties.
- (c) Adoption where a manufacturer states that a forcing pen or ramp is in accordance with this Standard.

NOTES

Australian Standard®

Livestock loading/unloading ramps and forcing pens

Section 1 Scope and general

1.1 Scope

This Standard sets out requirements for loading/unloading ramps and forcing pens to enable persons to safely load and unload livestock from vehicles used to transport them, and ensure the welfare of livestock and the safety of livestock handlers. It covers —

- (a) stock yard panels;
- (b) gates;
- (c) latches;
- (d) surfaces;
- (e) sheeting;
- (f) walkways and access;
- (g) structural elements; and
- (h) vehicle access.

It includes examples of ramp design and infill positioning, and guidelines for risk management.

The Standard applies to rear, side and cross-loading ramps.

The Standard does not cover any other forms of livestock yards.

The Standard does not refer to work on or in livestock crates.

1.2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document:

NOTE Documents referenced for informative purposes are listed in the Bibliography.

AS 1319, *Safety signs for the occupational environment*

AS 1379, *Specification and supply of concrete*

AS 1418.2, *Cranes (including hoists and winches), Part 2: Serial hoists and winches*

AS 1450, *Steel tubes for mechanical purposes*

AS 1657:2018, *Fixed platforms, walkways, stairways and ladders—Design, construction and installation*

AS/NZS 1163, *Cold-formed structural steel hollow sections*

AS/NZS 1554.1, *Structural steel welding, Part 1: Welding of steel structures*

AS/NZS 1594, *Hot-rolled steel flat products*

AS/NZS 1665, *Welding of aluminium structures*

AS/NZS 3678, *Structural steel—Hot-rolled plates, floorplates and slabs*

AS/NZS 3679.1, *Structural steel, Part 1: Hot-rolled bars and sections*

*AS/NZS 3679.2, Structural steel, Part 2: Welded I sections***1.3 Terms and definitions**

For the purposes of this document, the following terms and definitions apply.

1.3.1**bridging flap**

adjustable bridge, normally attached to the top of a ramp, designed to eliminate any gap between the livestock crate and ramp floors

1.3.2**cattle crush**

device for restraining livestock

Note 1 to entry: Also known as vet crush or head bail.

1.3.3**competent person**

person having such knowledge and experience of livestock loading/unloading ramps, forcing pens, and associated equipment, as is necessary for that person to assess their condition and make an informed judgement as to whether or not they may safely remain in service

1.3.4**control**

measure, in relation to a risk to health and safety, to eliminate or minimize the risk to people or animals

Note 1 to entry: Control involves a hierarchy of controls including: elimination; substitution; isolation; engineering; administration; personal protective equipment.

1.3.5**critical control point**

point at which failure to control risk may cause harm to people or animals

1.3.6**dump ramp**

wide ramp designed only for unloading

1.3.7**forcing pen**

holding pen that allows operators to encourage animals up the race or ramp while maintaining segregation between livestock and people

Note 1 to entry: Forcing pens come in different shapes including conventional or round style designs.

1.3.8**hazard**

source or situation with a potential to cause injury and ill health to a person or animal

1.3.9**large livestock**

animals such as bovines (cattle), equines (horses), camelids (camels, alpacas)

1.3.10**livestock crate**

device used to contain livestock during transport

Note 1 to entry: A livestock crate could be a truck, train, ship, car trailer, aircraft, etc.

1.3.11**livestock crate door pin**

device that secures the livestock crate door

1.3.12**may**

indicates the existence of an option

1.3.13**non-bruise material**

smooth-surfaced material without projections or sharp corners

1.3.14**personal access gate**

gate to allow an operator to safely enter or exit the internal structure of a livestock facility

1.3.15**race**

set of parallel panels leading up to the ramp

1.3.16**ramp**

stockyard structure used for loading and unloading livestock to or from a livestock crate, including portable ramps and cross-loading ramps or platforms

1.3.17**ramp entry/exit gate**

gate positioned at the top of a ramp to allow operator to enter or exit the ramp or livestock crate

1.3.18**ramp safety lock**

failsafe system intended to prevent an adjustable ramp from freefalling whilst in use

1.3.19**rear loading**

method used for loading livestock that requires the livestock crate to be reversed back onto the loading/unloading ramp

Note 1 to entry: See [Appendix D](#) for information on loading methods.

1.3.20**risk**

possibility that harm (death, injury or illness) can occur to a person or animal when exposed to a hazard

1.3.21**safe working load****SWL**

maximum load that the material handling equipment is designed and constructed to handle or support safely

Note 1 to entry: Under certain conditions the SWL may not be the same as the working load limit (WLL), [1.3.33](#).

Note 2 to entry: SWL is no longer used to identify the maximum capacity of equipment due to being too vague.

1.3.22**safety gate**

gate operated from outside the ramp, fitted to the livestock crate end of a loading ramp, that provides separation between the livestock and the handler while they install/remove any bridging flaps and or open/close the livestock crate door

Note 1 to entry: Also known as a “head gate”.

1.3.23**shall**

indicates that a statement is mandatory

1.3.24**should**

indicates a recommendation

1.3.25**side loading**

method generally used for loading livestock from trucks that have multiple trailers

Note 1 to entry: See [Appendix D](#) for information on loading methods.

1.3.26**slam shut latch**

latch that is designed to automatically engage when a gate is thrown or pushed shut

1.3.27**slide gate**

sliding gate that is externally operated, used to prevent livestock from moving forward or backward when they are in a narrow raceway, vet crush or loading ramp

Note 1 to entry: Sliding gates may also be used in other places instead of throw gates.

1.3.28**small livestock**

animals such as ovines (sheep), caprines (goats), porcines (pigs), small bovines (bobby calves)

1.3.29**throw gate**

internal gate that includes a slam shut catch that can be operated from an external position

1.3.30**under and over ramp**

fixed multi-level ramp where the upper ramp floor passes over the lower ramp floor

1.3.31**walkway**

designated walking surface used for moving from one point to another

1.3.32**winch**

mechanical lifting device used to change height or incline of a loading ramp

1.3.33**working load limit****WLL**

maximum load that should ever be applied to the product under any condition

Note 1 to entry: The WLL is based on a load being uniformly applied in a straight line pull.

Note 2 to entry: See also [1.3.21](#), safe working load (SWL).

Section 2 Design

2.1 General

As the volume of livestock throughput and/or frequency of use increases, so do the potential risks and the need to have purpose-built equipment that deals with these risks. Around Australia there are many different types of livestock loading facilities. These may typically be as follows:

- (a) *Small farms* — low volume, infrequent usage.
- (b) *Mid-farms/small commercial facilities* — medium volume, infrequent usage.
- (c) *Large farms/medium commercial facilities* — medium volume, frequent usage.
- (d) *Annual/special sales* — medium-high volume, infrequent usage.
- (e) *Large commercial facilities* — high volume, high frequency.

Work health and safety laws recognize that what is “reasonably practicable” for different facilities may vary depending upon factors such as frequency of use and exposure, type of livestock being handled and environmental conditions. However, there are some general design principles that should be applied to all livestock loading facilities regardless of their size. These include consideration of the following:

- (i) Primary aims:
 - (A) People and animals should be separated.
 - (B) Facilities should minimize safety and welfare risks to both people and animals and promote smooth “flow” of livestock.
- (ii) Intended use:
 - (A) Ramps should be constructed for the species of livestock and type of crate or vehicle used.

NOTE 1 Ramps may be constructed for use by multiple species of livestock and consideration should be given to controlling the highest risk levels posed by the livestock for which the ramp is intended.
 - (B) Ramp alignment should take into account light sources, including the sun, that may affect livestock movement.
 - (C) Noise and visual distractions should be minimized.
 - (D) Ramps should be built to enable single operator use and ease of operation.

NOTE 2 It is advisable that loading and unloading is not carried out by a single person; however, the ramp design should take into account that this is sometimes unavoidable.
- (iii) Best practice design:
 - (A) Facility operators should consult with facility users to assist in the initial design phase.
 - (B) Hazards should be addressed through good design in preference to management controls.

NOTE 3 For guidelines on risk management, see [Appendix B](#).
 - (C) Non-slip (easy to clean) and non-bruising materials should be used throughout.
 - (D) Engineer’s information and statutory requirements should be referenced when designing new ramps or replacing bolts, cabling and hardware, to maintain a safe

working load (WLL) limit. The application of a safe working load (SWL) should take into consideration type of hitch, whether straight line pull, choke hitch, basket hitch or multi-leg slings.

- (iv) Safety standards:
- (A) Facility operators should regularly consult with facility users to assist in the early identification of emerging safety risks.
 - (B) Facilities should be clean and in a good state of repair.
 - (C) Rated capacity should be displayed on the ramp and the working load limit (WLL) displayed on any winch/hoist.
 - (D) Persons using the facility should be appropriately trained according to their role.
 - (E) Facility users should report all faults or safety issues to management.
 - (F) Hazards, risks and controls should be reviewed periodically and after an incident or near miss.

NOTE 4 For further information on ramp designs, see [Appendix A](#).

2.2 Vehicle access

2.2.1 General

Access should accommodate transport vehicles that frequent the site.

2.2.2 Traffic flow

Entry and exit points for vehicles should minimize traffic hazards.

Commercial facilities should develop a traffic flow plan. The traffic flow should be free from dangerous obstructions such as power lines and trees.

A no-go zone should be observed between the loading ramp and vehicles reversing towards the loading ramp.

2.2.3 Approach

Vehicular approach to the ramp should be a level all-weather surface for both side and rear loading.

A line should be painted, or reflective material fitted, on concrete or bitumen road surfaces to assist this approach.

Vehicles should not be required to commence reversing on a public roadway.

Use of loading facilities should not block vehicle traffic flow either within the facility or on a public roadway.

NOTE The user of this Standard should refer to relevant Federal, State, and Territory regulations to determine legal requirements relating to public roadways, as applicable.

2.2.4 Ramp alignment with livestock crate

The floor of the ramp should align with the livestock crate floor/deck. This may be achieved by aligning the vehicle with the ramp, and ensuring that the ramp is at a suitable height for the vehicle. The front face of the ramp should be parallel to the livestock crate door.

Extreme caution should be observed when working near trees and overhead power lines.

NOTE See the bibliography for guides to working near overhead powerlines, which cover safe clearances and no-go zones.

2.3 Ramp surfaces and angle

2.3.1 Ramp surfaces

Ramps shall have no sharp or protruding objects.

Ramp floors shall not be see-through.

Ramp flooring and surfaces should be designed to maximize grip and minimize slipping and falling. To improve grip, slats or grooves should be used in the surface.

EXAMPLE 1 For large livestock, the surface should be non-slip, for example with cross cleats 40 mm to 50 mm wide spaced at 300 mm centres or, if concrete, have a suitable cross-grooved pattern to provide good footing when the ramp is wet.

EXAMPLE 2 For small livestock, the surface should be non-slip, for example with cross cleats 25 mm wide and high at 200 mm centres.

2.3.2 Ramp angle

The incline angle of a fixed ramp shall not exceed 20°.

The incline angle of an adjustable ramp shall not exceed 25°.

While the adjustable ramp angle may be up to 25°, the operator walkway angle shall be in accordance with AS 1657:2018.

A level area at the top of the ramp should be provided for large livestock (see [Clause 2.16.3](#)).

NOTE In general, the smaller the incline angle, the better the outcome for the livestock and handler.

2.4 Ramps, height of sidewalls and internal width

Loading ramp width should be determined by the type/species of livestock being handled.

Dump ramps should be wider than loading ramps to allow animals to turn around and provide for free animal movement.

The minimum internal width of a loading ramp should be 800 mm for large livestock, 900 mm for small livestock.

The minimum ramp wall heights should be 1700 mm for large livestock, 1000 mm for sheep, and 1200 mm for goats.

2.5 Ramp side infills

Infill shall be fitted to the inside walls of ramps and ramp entry/exit gates.

Infill shall extend from not more than 50 mm above the ramp floor to not less than either —

- (a) the height of the top rail of the ramp; or
 - (b) 1000 mm above the surface on which the operator is to stand,
- whichever is less.