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for

DR AS 5340:2020, Livestock loading/unloading ramps and forcing pens

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Draft

Australian Standard

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DR AS 5340:2020, *Livestock loading/unloading ramps and forcing pens*

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Preface

This Standard was prepared by the Standards Australia Committee SF-054, Safe design of livestock ramps and forcing yards.

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 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

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.

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, to 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 does not cover any other forms of livestock yards.

1.2 Normative references

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

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:

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 for high volume 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
livestock crate
device used to contain livestock during transport

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

1.3.10
livestock crate door pin
device that secures the livestock crate door

1.3.11
non-bruise materials
smooth-surfaced without projections, or sharp corners

1.3.12
personal access gate
gate to allow an operator to safely enter or exit the internal structure of a livestock facility

1.3.13
race
set of parallel panels leading up to the ramp

1.3.14
ramp
stockyard structure used for loading and unloading livestock

1.3.15
ramp entry/exit gate
gate positioned at the top of a ramp to allow operator to enter or exit the ramp or livestock crate

1.3.16
ramp safety lock
failsafe system intended to prevent an adjustable ramp from freefalling whilst in use

1.317
risk
possibility that harm (death, injury or illness) can occur to a person or animal when exposed to a hazard

1.3.18
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), 1.3.28.

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

1.3.19
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”.

1.3.20
shall
indicates that a statement is mandatory

1.3.21
should
indicates a recommendation

1.3.22
slam shut latch
latch that is designed to automatically engage when a gate is thrown or pushed shut

1.3.23
slide gate
sliding gate that is externally operated, which is 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.

1.3.24
throw gate
internal gate that includes a slam shut catch that can be operated from an external position

1.3.25
under and over ramp
fixed multi-level ramp where the upper ramp floor passes over the lower ramp floor

1.3.26
walkway
designated walking surface used for moving from one point to another

1.3.27
winch
mechanical lifting device used to change height or incline of a loading ramp

1.3.28
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 1.3.18, 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:

(i) Primary aims —

(A) people and animals should be separated; and

(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;

(B) ramps should be aligned north–south to avoid loading in the direction of the sun which is more likely if the ramp runs east–west, especially early or late in the day;

(C) noise and visual distractions should be minimized;

(D) if the facility will be used at night, overhead lighting, capable of evenly illuminating pens, loading areas and vehicles to encourage safe animal movement, should be provided; and

(E) ramps should be built to enable single operator use and ease of operation.

NOTE 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 For guidelines on risk management, see Appendix B.

(C) non-slip (easy to clean) and non-bruising materials should be used throughout; and

(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 limit. The application of a safe working load 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 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; and

(F) hazards, risks and controls should be reviewed periodically and after an incident or near miss.

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 level.

A line should be painted, or reflective material fitted, on the road surface to assist this approach.

Side loading vehicles should be able to approach a ramp on a level surface.

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.

NOTE Extreme caution should be observed when working near trees and overhead power lines. See the bibliography for guides to working near overhead powerlines that 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 cattle, 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 sheep, 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.

To assist the use of the ramp entry/exit gate, there should be a flat platform at the top of the ramp.

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

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 cattle, 900 mm for sheep and pigs.

The minimum ramp wall heights should be 1700 mm for cattle, 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 level at which the operator is standing,

whichever is less.

The operating position should allow the operator to see the livestock.

NOTE 1 The addition of infill to ramps encourages livestock to move freely and reduces the risk of injury to livestock and handlers.

NOTE 2 For explanatory diagrams of ramp infill positioning, see Appendix C.

2.6 Adjustable ramps

2.6.1 Prevention of ramp free-fall

Where ramps are adjustable, they shall be prevented from free-falling in the event of a failure of the lifting mechanism, either by the use of mechanical safety locks or by some other means.

Where mechanical safety locks are fitted; they shall automatically latch to progressively higher safety locking stops as the ramp is raised.

The mechanical safety locks shall be manually disengaged by the operator applying an action continuously (for example maintaining pressure on a foot pedal). If the operator ceases to apply the action then the safety locking device shall re-engage.

NOTE Mechanical safety locking stops should have vertical increments not exceeding 100 mm.

2.7 Supports and structural integrity

Fixed ramps shall have foundations that prevent movement.

Portable ramps shall have anchoring devices to prevent movement while livestock is being loaded or unloaded (e.g. wheel chocks).

2.8 Cattle crushes

If a cattle crush is part of the loading ramp or forcing pen structure, there shall be consistent livestock passage width from the cattle crush through to the ramp.

Any gates associated with the cattle crush shall be securely latched.

The cattle crush and its operating handles shall not impede access to, or use of, the forcing pen and ramp.

Crushes should not be fitted between the forcing pen and the loading ramp.

2.9 Forcing pens

Forcing pen size shall be a minimum of 10 m^2 in area.

Sharp or protruding objects shall be eliminated from the forcing pen.

Forcing pens shall be designed to accommodate the type of livestock and transport vehicles that will use the facility.

Forcing pens shall be designed with no blind corners so livestock can move freely.

Forcing pens shall be designed to enable the operator to move and direct livestock from the walkway, without having to enter the pen.

Forcing pens shall be sheeted to 1000 mm above the operator floor level.

Gate, fences and ramps should have smooth non-bruise surfaces.

NOTE 1 The operator should not enter the forcing pen while livestock are present.

NOTE 2 Multiple gates are advantageous when loading livestock to prevent them from moving backwards as they progress through the forcing pen and ramp.

NOTE 3 Consideration should be given to matching the forcing pen size to the size of the livestock crate to be loaded, for example the pen size should be built to accommodate a pen of stock for the usual size stock vehicles using the facility, plus an additional 20 % space (e.g. 1/2 a deck for semis which is usually 2.5 m × 7 m).

NOTE 4 Information on pen size can be found in *Guide for safe design of livestock loading ramps and forcing yards* (ALRTA).

2.10 Gates, latches, hinges, and chains

2.10.1 General

Gates should be capable of being quickly and safely shut.

2.10.2 Slam shut latches

Slam shut latches should be designed to accommodate movement of the post and gate without becoming unlatched.

Slam shut latches should be used in preference to chain latches and slide bolt type latches as the primary mechanism in high risk areas.

2.10.3 Throw gates in forcing pens

Throw gates should be hinged on the operator's side of the forcing pen and have a slam shut latch.

The throw gate slam shut latch should be operable from the operator's position.

2.10.4 Gate hinges

Gate hinges shall be —

(a) captive to prevent lift-off; and

(b) designed to be non-bruise.

2.10.5 Chains

Chains shall not be used as the primary locking mechanism for a gate.

Chains may be used as a secondary locking mechanism.

2.11 Guards

To prevent unauthorized access under adjustable ramps, guarding shall be installed around the base of ramps.

NOTE Refer to AS/NZS 4024.3610:2015, Clause 2.13 for information on guarding.

2.12 Headroom

Headroom in ramps and in forcing pens shall be in accordance with AS 1657:2018, Clause 3.1.5.

NOTE Headroom should be considered anywhere that people are expected to walk throughout the facility.

2.13 Walkways, ladders, steps and platforms

General access to the ramp and forcing pen area shall be free of obstructions that could cause slips, trips, or falls.

Walkways and ladders shall be in accordance with AS 1657:2018.

Access to the ramp should be provided from the right-hand (driver's) side.

On under/over ramps, the bottom level walkway should be on the right-hand (driver's) side to aid line of sight into the livestock crate in order to monitor stock movement.

NOTE Access from the right-hand (driver's) side assists the driver in making sure that the crate back door pin has been installed to prevent stock falling from livestock crate during transit as it encourages the driver to walk past the crate back door when returning to the vehicle cabin.

2.14 End of ramp buffers, extensions, and bridging flaps

2.14.1 Bumpers and end of ramp buffers

A self-aligning or compressible interface with the vehicle should be provided.

Gaps should be avoided at floor level.

Bumpers and buffer stops on front of ramp should be maintained in good condition.

2.14.2 Gap infills

Provision shall be made to cover any gaps between the loading ramp floor and the floor of the livestock crate (see Clause 2.14.3).

Provision should be made to cover any gaps between the sides of the loading ramp and the livestock crate (see Clause 2.14.3).

NOTE The intention of covering gaps is to prevent animal injury or escape.

2.14.3 Bridging flaps

Height variations and floor gaps between the ramp and the vehicle shall be compensated for by the use of flat or curved fold-down bridging flaps.

A retrieval mechanism (for example a chain) shall be provided to allow the operator to operate it either from inside or from outside the ramp.

A safety gate shall be incorporated to protect the operator from livestock while closing the door of the crate or retrieving the bridging flap from inside the ramp.

2.15 Winches, and loadbearing fixing points

Hoists/winches shall be attached in such a way as to ensure that the fixing point can handle the working load limit (WLL) specific to the ramp.

NOTE Winches shall conform to AS 1418.2.

2.16 Personnel access

2.16.1 General access

Personnel access or "man" gates shall be strategically located to provide safe access from the vehicle to the working areas.

2.16.2 Access to the livestock crate door pin

Access to the livestock crate door pin shall be available from either the ramp or the ramp walkway or both.

2.16.3 Ramp entry/exit gates

A ramp entry/exit gate shall be provided at the top of the loading ramp as close as practicable to the livestock crate.

A ramp entry/exit gate should be provided for safe access to rear of vehicle to close the crate door and for retrieval of flap.

NOTE 1 The ramp entry/exit gate should open onto a flat area free of obstructions.

NOTE 2 Ramp entry/exit gates should be self-closing and non-latching.

2.17 Signage

2.17.1 General

Ramp signage shall be in accordance with AS 1319.

2.17.2 Site-specific

If a traffic control flow plan has been developed for the site, directional signage should be provided.

Signage should be provided indicating emergency contact and incident reporting details.

2.17.3 Adjustable ramps

Signage shall be provided adjacent to where the operator is working the adjustable ramp, indicating —

(a) that the ramp height shall not be adjusted while people or livestock are on the ramp;

(b) the maximum working load of the ramp;

(c) that the ramp shall not be used if its maximum working load will be exceeded; and

(d) that the area bounded by guarding fitted below the ramp shall not be entered by unauthorized personnel.

Operating instructions shall be provided adjacent to where the operator is working the ramp for —

(i) raising and lowering the ramp; and

(ii) operating the safety locks if fitted.

2.18 Supporting infrastructure

Consideration should be given to integrating ramp walkways with infrastructure that assists in accessing the side of livestock crates.

Section 3 Materials

3.1 General

Materials used in the construction of livestock loading/unloading ramps and forcing pens and their component structural parts shall be in accordance with Clauses 3.2 to 3.5.

3.2 Steel

Steel shall, before fabrication, be in accordance with the following Standards, as appropriate:

(a) AS/NZS 1163.

(b) AS/NZS 1594.

(c) AS/NZS 3678.

(d) AS/NZS 3679.1.

(e) AS/NZS 3679.2.

(f) AS 1450.

Welded components shall be in accordance with the requirements of AS/NZS 1554.1 and AS/NZS 1665.

3.3 Fasteners

Nuts and bolts, screws, pins and rivets used shall be fit for purpose and of industrial quality; and as such be in accordance with the relevant Australian Standard.

NOTE Evidence of industrial quality and accordance may include, but is not limited to, batch testing, certification and batch traceability.

3.4 Welding

Welds shall be dressed smooth, sharp edges removed and, where appropriate, plugs fitted to the end of pipe sections.

Welding of steel components shall be in accordance with AS/NZS 1554.1.

Welding of aluminium components shall be in accordance with AS/NZS 1665.

3.5 Concrete

Concrete shall be in accordance with AS 1379.

3.6 Weather resistance

Metalwork should be treated to minimize corrosion.

Timber should be treated to prevent rotting.

NOTE 1 Refer to AS 2312.1 and AS 2312.2 for information on corrosion protection of structural steel by the use of protective coatings.

NOTE 2 Refer to AS 1604.1 for information on timber preservative treatments.

Section 4 Maintenance

4.1 General

All components of the livestock loading/unloading facility including but not limited to ramp surfaces, sidewalls, rails, infills, gates, latches, hinges, chains, guards, walkways, ladders, steps, platforms, fences, end of ramp buffers, extensions, bridging flaps, lifting mechanisms, safety locks, and load bearing fixing points shall be periodically inspected by a competent person.

Components determined by inspection to be not suitable for service shall be replaced, repaired, or serviced as appropriate.

4.2 Lifting equipment and mechanical safety locks

Lifting equipment and mechanical safety locks (if fitted) should be periodically inspected and maintained in accordance with manufacturer's recommendations.

Section 5 Health and safety

This Standard includes advice on work health and safety (WHS); however, the user of this Standard needs to refer to relevant federal, state and territory regulations and determine legal requirements as applicable.

See the bibliography for health and safety-related information.

Section 6 Animal welfare

The user of this Standard should refer to relevant federal, state, and territory regulations for the prevention of cruelty to animals, including livestock, and determine legal requirements as applicable.

The user of this Standard should also refer to the Australian Animal Welfare Standards and Guidelines for the Welfare of Animals as appropriate —

(a) Australian Animal Welfare Standards and Guidelines for Sheep;

(b) Australian Animal Welfare Standards and Guidelines for Goats;

(c) Australian Animal Welfare Standards and Guidelines for Cattle;

(d) Australian Animal Welfare Standards and Guidelines for the Land Transport of Livestock; and

(e) Australian Animal Welfare Standards and Guidelines for Saleyards and Depots.

Appendix A
(informative)

Suggested ramp designs

A.1 General

Livestock handling facilities may have different loading and unloading requirements depending upon the operation being conducted, intensity of use, type of livestock being handled and the type of vehicles using the facility. There is no “one size fits all” solution.

A.2 Single-deck and multi-deck designs

Ramps that afford the direct delivery of livestock to all deck(s) of a livestock crate (for example adjustable single-deck ramps or fixed multi-deck ramps), should be considered in order to avoid livestock having to navigate livestock crate internal ramps.

Adjustable single-deck ramps or multi-deck ramps should be used at saleyards, feedlots, abattoirs and larger farms.

NOTE 1 Single-deck ramps are adequate for smaller farms and low intensity commercial facilities that use single deck transport.

NOTE 2 Multi-deck ramps are beneficial to livestock and operator welfare for both loading and unloading.

Appendix B
(informative)

Risk management

B.1 Identifying the hazards

The risk management process should identify all hazards. Hazard identification should be done as early as possible in the concept development and design phases of the risk management. For proposed new infrastructure, this involves identifying issues, practices and situations that could potentially cause harm to people or animals throughout the livestock loading facility's lifecycle and the reasonably foreseeable hazards associated with each activity.

Hazards usually relate to the plant itself or how and where it is used. Hazards may be identified by conducting workplace inspections and reviewing specified work procedures.

Workers, equipment users, manufacturers, importers, suppliers, plant and health and safety specialists should be consulted and relevant information, records and incident reports reviewed.

B.2 Assessing and controlling risks

A risk assessment involves considering what could happen to a person or animal if exposed to a hazard or risk and the likelihood of it happening.

If a risk is identified, the "Hierarchy of Control Principles" should be applied to determine a suitable rectification measure, starting with elimination as the highest and most desirable form of control, and moving to progressively lower forms of control as and if each current choice is found to be impractical:

(a) Eliminate the risk.

(b) Substitution — consider changing facilities.

(c) Implement an engineering control.

(d) Isolate the risk from people/livestock.

(e) Introduce administrative controls such as information, education and training.

(f) Install advisory signage.

This Standard primarily addresses reduction of hazards/risks in the design stage. While sound livestock handling techniques are essential to reduce the risk of interaction of people and livestock, ensuring that handling facilities are designed to eliminate or minimize risk is the most effective method that can avoid costly changes after the facilities are operational.

The risk controls outlined in this Appendix have been developed with wide consultation with industry stakeholders; however, they are non-exhaustive and innovative approaches to controlling risks are encouraged.

B.3 Critical control points for livestock ramps and forcing pens

A critical control point is the point in a process where failure to control known hazards can lead to serious harm to people, animals or equipment, and addressing critical control points is a recognized way of achieving the greatest impact in terms of identifying hazards and reducing risks.

The livestock loading process is relatively common and well-understood. Industry experts agree that there are six critical control points. These are illustrated for a cattle ramp and forcing pen in Figure B.3(A), for a sheep ramp and forcing pen in Figure B.3(B), and for a circular forcing pen in Figure B.3(C). The critical control points are covered in greater detail in the following Tables which identify hazards, risks, and applicable clauses:

(a) Table B.3.1 Critical Control Point 1: Interface between livestock crate and loading ramp.

(b) Table B.3.2 Critical Control Point 2: Entry/exit gate at top of ramp.

(c) Table B.3.3 Critical Control Point 3: Loading/unloading ramps.

(d) Table B.3.4 Critical Control Point 4: Access gates.

(e) Table B.3.5 Critical Control Point 5: Interface in forcing pen.

(f) Table B.3.6 Critical Control Point 6: Gates.

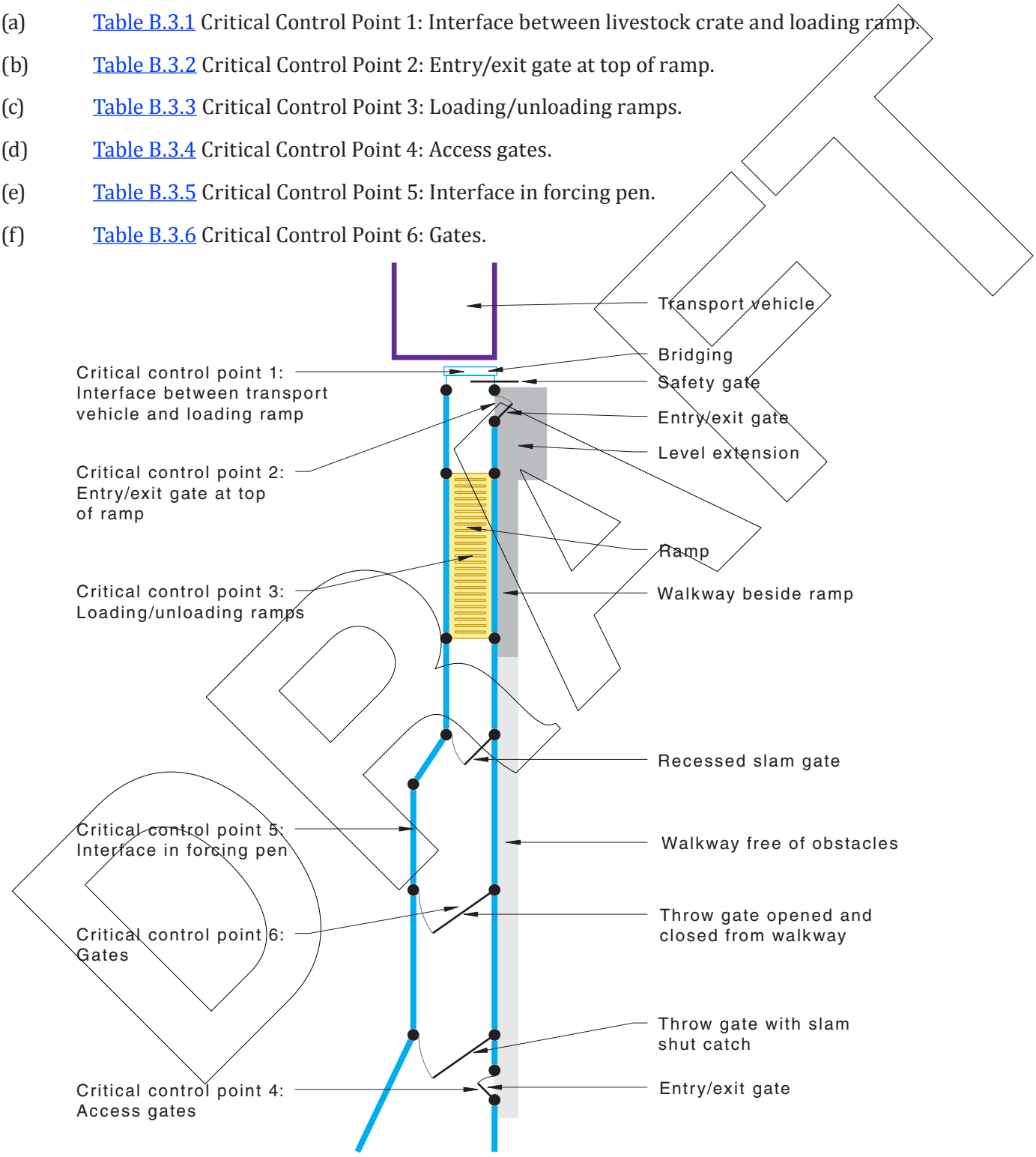


Figure B.3(A) — Critical control points in cattle ramp and forcing pen layout

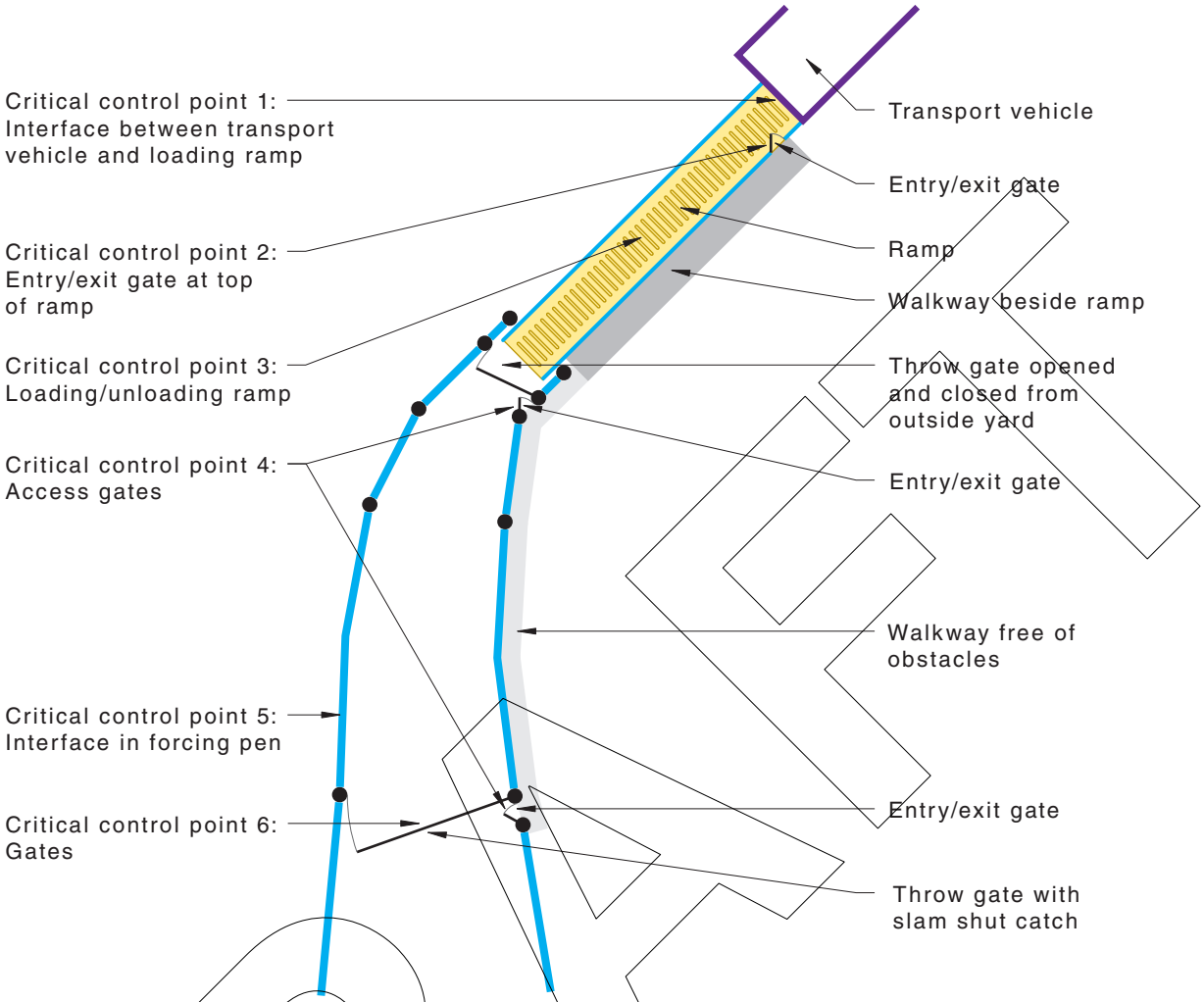


Figure B.3(B) — Critical control points in sheep ramp and forcing pen layout

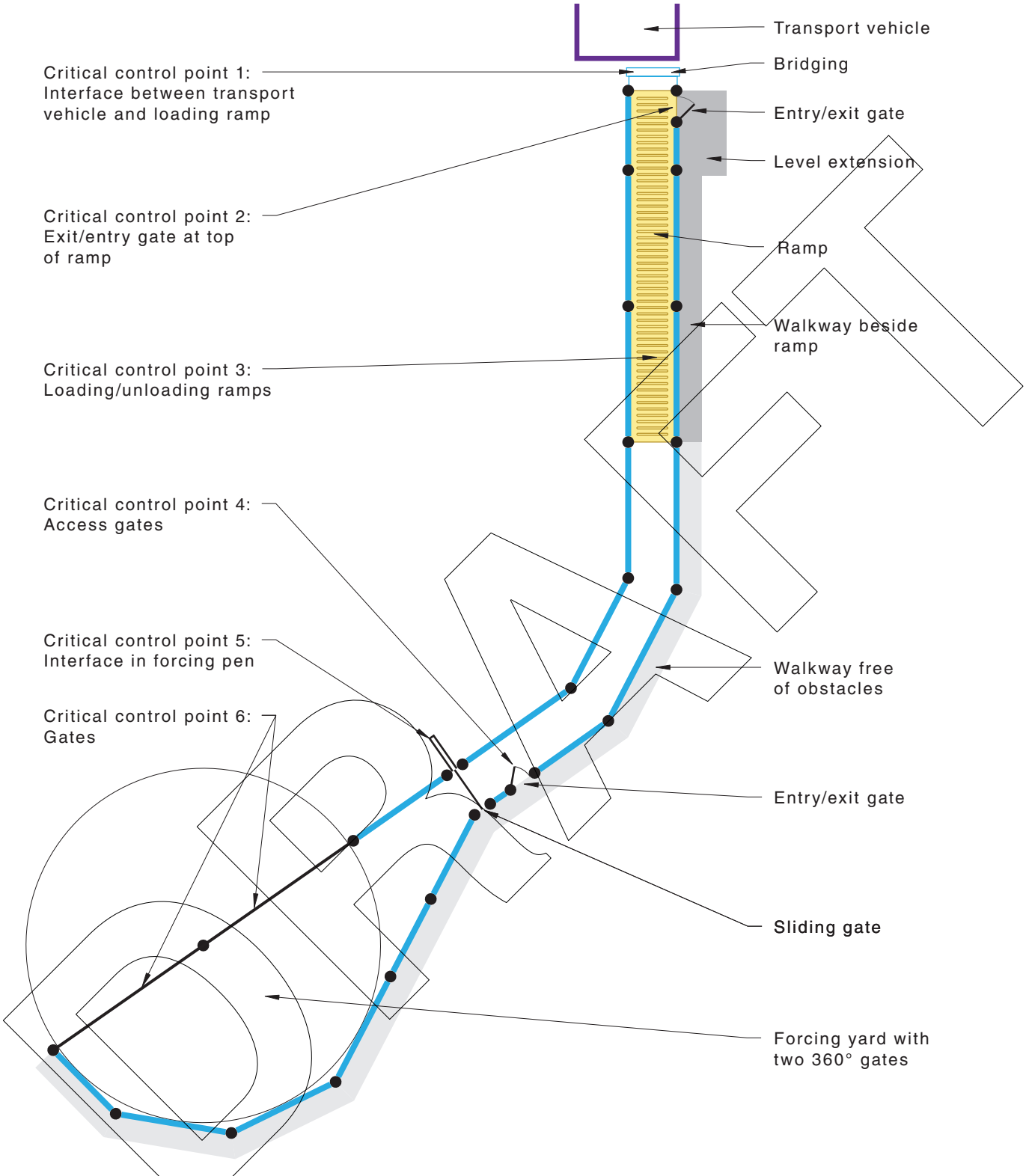


Figure B.3(C) — Critical control points in ramp and circular forcing pen layout

Table B.3.1 — Critical Control Point 1 — Interface between livestock crate and loading ramp

#	Hazard	Risks	Relevant Clauses and Figures
1.	Poor vehicle access to loading point	(a) Damage to vehicle or ramp (b) Inefficient loading practices causing stress to people and animals (c) Crash risk to vehicles on public roads	Clause 2.2, Vehicle access.
2.	Crushing point between rear of vehicle/trailer and front of ramp	Severe injury or death due to entrapment or being struck by vehicle	Clause 2.2.2, Traffic flow.
3.	Ramp not securely fixed to the ground	Ramp moving backwards or becoming unstable when vehicle backs into it	Clause 2.7, Supports and structural integrity. Figure B.3(D)
4.	Ramp not securely fixed or aligned with the vehicle	(a) Damage to rear of livestock crate (b) Slip, trip, fall injury to operator (c) Injury to livestock due to legs falling between gaps (d) If gap too excessive provides possible escape point for livestock (e) Risk to public being struck by escaped animals	Clause 2.7, Supports and structural integrity, Clause 2.2.4, Ramp alignment with livestock crate Figure B.3(E), Figure B.3(F), Figure B.3(G), and Figure B.3(H)
5	Rough, slippery or steep access from ground level to facility creating slip, trip or fall issue	Laceration or fracture injury to operator	Clause 2.13, Walkways, ladders, steps and platforms

Figure B.3(D) — Wheel chock

Figure B.3(E) — Suitable height alignment of ramp to livestock crate floor

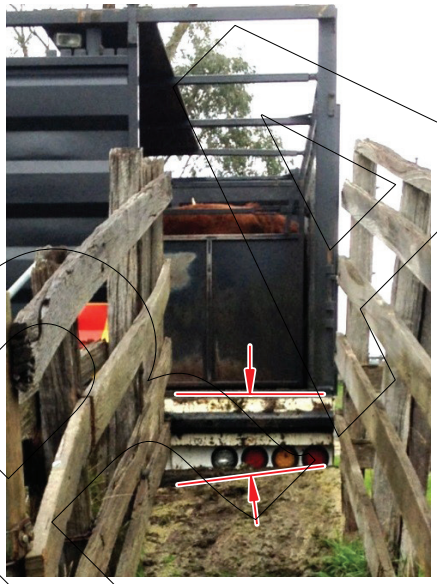


Figure B.3(F) — Poor alignment of ramp to livestock crate floor

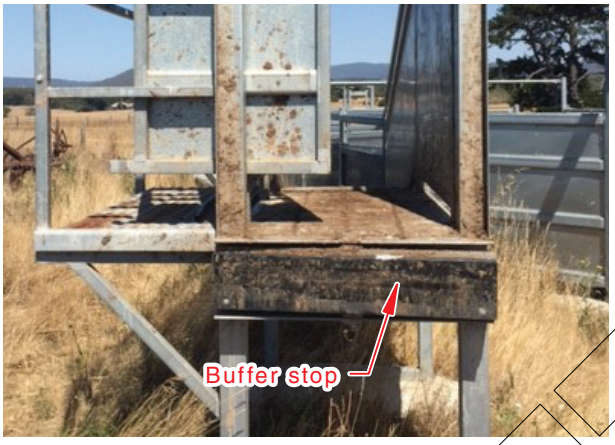


Figure B.3(G) — Buffer stop on front of ramp in good condition

Figure B.3(H) — Self-aligning buffer stop on front of ramp

Table B.3.2 — Critical Control Point 2 — Entry/exit gate at top of ramp

#	Hazard	Risks	Relevant Clauses and Figures
1	No entry/exit gate at top of ramp	Operator having to climb the fence to gain access	Clause 2.16.3, Ramp entry/exit gates Figure B.3(J)
2	No safety gate at top of ramp	Being struck by livestock coming back out of vehicle while retrieving fold-over flap and/or closing crate door	Clause 2.14.3, Bridging flaps Figure B.3(I) and Figure B.3(K)
3	Insufficient head clearance	Striking head on overhead structures	Clause 2.12, Headroom.

Figure B.3(I) — Accessible bridging flap retrieval chain at front of ramp and safety gate

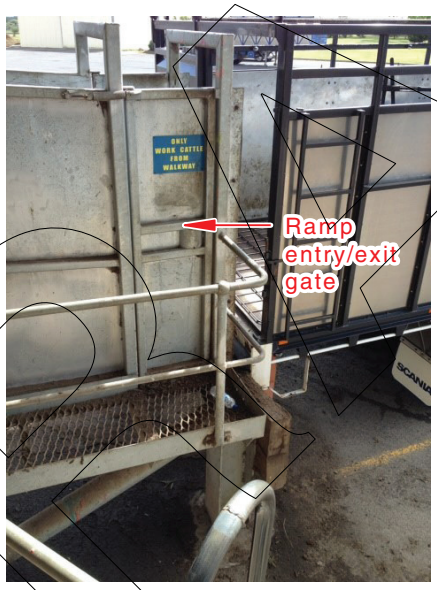


Figure B.3(J) — Ramp entry/exit gate at top of ramp

Figure B.3(K) — Sliding safety gate at front of ramp to allow safe access to close/open livestock crate door

Table B.3.3 — Critical Control Point 3— Loading/unloading ramps

#	Hazard	Risks	Relevant Clauses and Figures
1	Loading/unloading into a multi-deck crate	Slip, trip, fall injury to livestock or operator	Clause 2.3.2, Ramp angle.
2	Slippery surfaces or protruding objects	Slip, trip, fall or impact injury to livestock or operator	Clause 2.3.1, Ramp surfaces; Clause 2.13, Walkways, ladders, steps and platforms Figure B.3(L), Figure B.3(M).
3	Loading ramp too wide allowing livestock to baulk or turn around	(a) Livestock will suffer stress and damage or jam across the ramp (b) Operator may enter the ramp or race in an attempt to move livestock	Clause 2.4, Ramps, height of sidewalls and internal width
4	Unloading (dump) ramp too narrow or has no clear line of sight	Livestock may need to be forced to exit the vehicle	Clause 2.4, Ramps, height of sidewalls and internal width
5	Overall ramp height inappropriate	(a) Poor alignment with crate decks causing steps or gaps (b) Slip, trip, fall injury to livestock or operator	Clause 2.2.4, Ramp alignment with livestock crate
6	Ramp wall heights inappropriate	Too low will allow livestock to exit over the sides	Clause 2.4, Ramps, height of sidewalls and internal width
7	Ramp incline angle too steep creating difficulty in loading livestock	(a) Livestock will not freely move up or down a ramp that is too steep (b) Livestock will slip and possibly lay down causing injury	Clause 2.3.2, Ramp angle
8	Ramp surface too smooth or covered in mud and effluent	Livestock will slip and possibly lay down causing injury	Clause 2.3.1, Ramp surfaces. Figure B.3(L), Figure B.3(M)

Table B.3.3 *(continued)*

#	Hazard	Risks	Relevant Clauses and Figures
9	Lack of infill on the sides of ramp and race walls	(a) No or limited infill on ramp side walls cause livestock to baulk. There is also the potential for the legs of livestock to slide out through gaps causing injury (b) Potential injury to people if arms or legs are placed through rail gaps or animal horns protrude	Clause 2.5, Ramp side infill. Figure B.3(N).
10	Adjustable ramps with faulty safety locks, no operating instructions or designed Safe working load displayed	(a) Incorrect use due to lack of instructions (b) Unless ramp is locked into a set position before use it has the potential to fall causing damage to structures and injury to livestock and operators (c) Overloading or operating a ramp while loaded with livestock poses a significant risk (d) The structural load of the winch is different to its lifting capacity. This can lead to confusion if not clarified	Clause 2.6, Adjustable ramps. Figure B.3(O), Figure B.3(P).

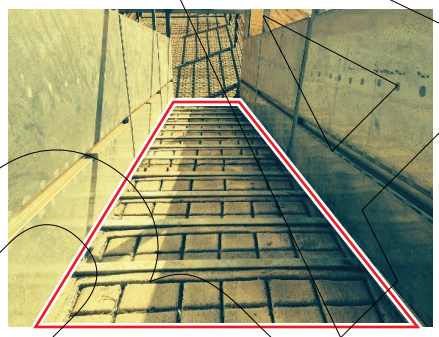


Figure B.3(L) — Non-slip surface on floor of ramp

Figure B.3(M) — Non-slip surface

Figure B.3(N) — Infill on walls of ramps

Figure B.3(O) — Locking device on adjustable height ramp

Figure B.3(P) — Ramp locking device

Table B.3.4 — Critical Control Point 4 — Access gates

#	Hazard	Risks	Relevant Clauses and Figures
1	Direct exposure to livestock	Injury by being struck, kicked or crushed by animal	Clause 2.16.1, General access Figure B.3(Q)
2	Climbing over rails and gates	Potential slip, trip and fall injuries	Clause 2.13, Walkways, ladders, steps and platforms Figure B.3(R)
3	Unauthorized access underneath ramp	Injury potential in the event of collapse, falling objects or mechanical devices	Clause 2.11, Guards Figure B.3(S)

Figure B.3(Q) — Self-closing personal or "man" access gate

Figure B.3(R) — Continuous walkway with no tripping hazards

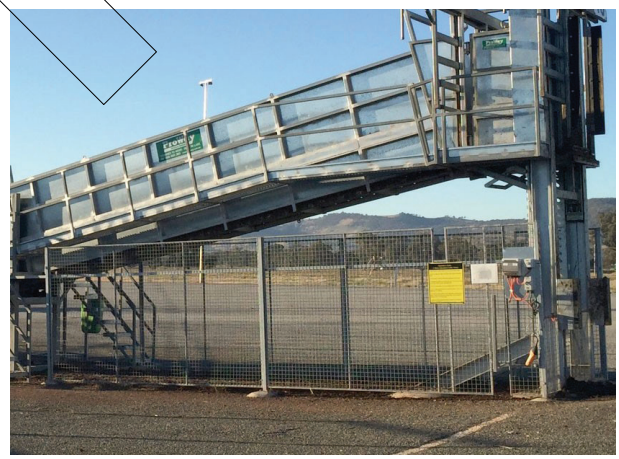


Figure B.3(S) — Guarding around base of ramps to avoid unauthorized access

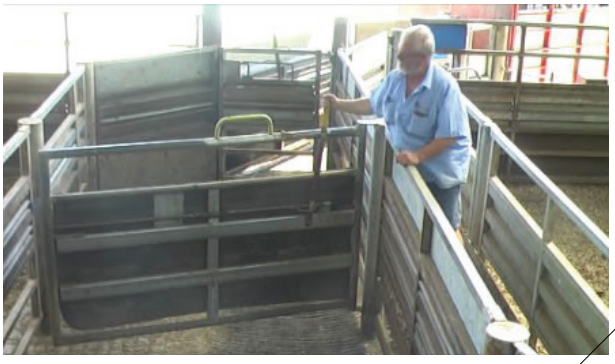
Table B.3.5 — Critical Control Point 5 — Interface in forcing pen

#	Hazard	Risks	Relevant Clauses and Figures
1	Slippery surfaces or protruding objects	Slip, trip, fall or impact injury to livestock or operator	Clause 2.9, Forcing pens Figure B.3(T)
2	Direct exposure to livestock	Injury by being struck or kicked by animal	Clause 2.9, Forcing pens

Figure B.3(T) — Forcing pen with no blind corners and with infill sheeting

Table B.3.6 — Critical Control Point 6— Gates

#	Hazard	Risks	Relevant Clauses and Figures
1	Operator being struck by gate	Crushing and striking injury due to throw back of gates	Clause 2.10, Gates, latches, hinges, and chains Figure B.3(U)
2	Attempting to engage chains on gates under pressure	Hand or finger laceration	Clause 2.10.5, Chains
3	Non captive gate hinges cause gate lift off	Damage to livestock and operators	Clause 2.10.4, Gate hinges



(a)

(b)

Figure B.3(U) — Externally operated throw gate

Appendix C
(informative)

Ramp infill positioning

Figure C(A) shows two examples of ramp infill positioning.

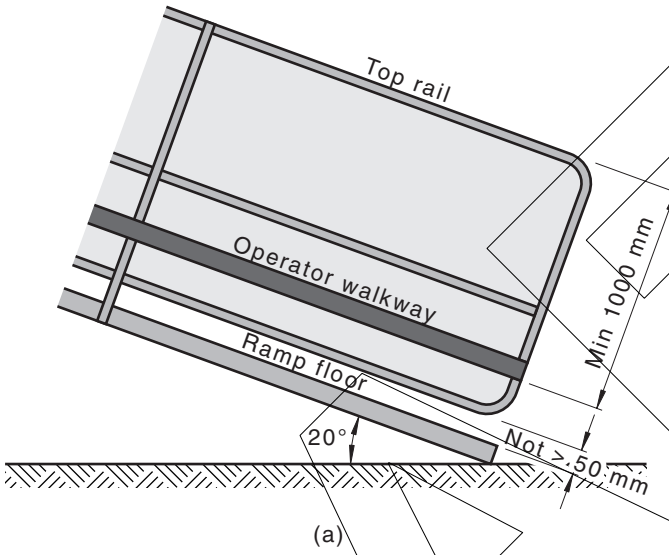


Figure C(A) — Infill positioning

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Australian Livestock & Property Agents Association
Australian Livestock and Rural Transporters Association
Australian Livestock Markets Association
Australian Lot Feeders Association
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