Elevating and Amusement Devices Safety Division	Ref. No.: 543 / 22
GUIDELINE	Date: March 21, 2022

IN THE MATTER OF:

THE *TECHNICAL STANDARDS AND SAFETY ACT* 2000, S.O. 2000, c. 16

- and-

ONTARIO REGULATION 221/01 (Amusement Devices) made under the

***Technical Standards and Safety Act,* 2000**

- and-

the Amusement Devices Code Adoption Document dated June 1, 2001, as amended by AD CAD 541 / 21

Subject: Guideline for the Design Review of Rides manufactured prior to January 1, 2012
Distribution: Posted on TSSA website

The Director for the purposes of Technical Standards and Safety Act, pursuant to section 36(3)(a) of Technical Standards and Safety Act, 2000 (authorize the use of guidelines), hereby provides notice that:

1. Scope of this guideline

Amusement rides and devices classified as Simple and Medium, per Advisory 542/21, manufactured prior to January 1, 2012 that are coming into Ontario as a New Installation shall meet the latest edition of the Code Adoption Document (CAD) OR the requirements set out in this guideline.

This guideline does not apply to Inflatables, Waterslides, Ziplines, Go-Karts, Bungee Jump and Bungee Assisted Bounce.

2. This guideline is effective March 21, 2022

3. General Instructions/Information

3.1. A technical dossier submission is required and shall include documents listed in O. Reg. 221/01 9. (2). Parts 1, 2 and 3 of the latest edition of the CAD shall be met as applicable except that the requirements of 3.1 of the CAD shall be permitted to be replaced with the requirements specified in this guideline in sections:

a) 4 (Mechanical Requirements);
b) 5 (Structural Requirements); and
c) 6 (Electrical Requirements).

All code referenced section numbers (ie. requirements /clauses) are permitted to use newer editions of code (later versions).

3.2. This guideline does not consider requirements for abnormal or unusual conditions and does not provide requirements for engineering and construction which would have been applicable under the code that this device was originally design and manufactured. Where items are in question the submitting engineer in conjunction with the designer/manufacturer must consider those in the technical dossier submission. Where the designer/manufacturer is no longer in business, management / mitigation of those issues shall be performed by an engineer.

3.3. Any modification to the amusement ride or device from the original manufactured condition shall be listed.

3.4. A technical dossier submission for Simple and Medium Amusement Ride or Devices manufactured prior to January 1, 2012, shall include a completed checklist (ref: Appendix A) outlining the items from section 4, 5, and 6 that were considered and implemented in the ride review where compliance to the latest F24 requirements are not practical.
Where applicable on the checklist outline whether compliance is achieved (Yes/No) or if the item listed is not applicable (N/A) and where relevant indicate the method or means used to demonstrate compliance.
Note: *The Checklist for Rides Manufactured Prior To January 1, 2012* is provided at the end of the AR specification sheets.

Requirements for Simple and Medium Amusement Rides or Devices Manufactured Prior To January 1, 2012

4. Mechanical Requirements

4.1. Patron restraint, clearance envelope, and containment design criteria requirements shall meet F2291-21 section 6
4.2. Loads, Strength and Acceleration or Deceleration shall be assessed by Engineer using good engineering practice.
4.3. Hydraulic Systems shall meet F2291-21 section 9
4.4. Pneumatic Systems shall meet F2291-21 section 10
4.5. Brakes shall meet F2291-21 section 13.7 and:
a) Where appropriate, energized critical braking systems shall remain activated in the event of power failure. (Z267-00 5.8.2)
b) Where appropriate, operator-monitored braking systems shall be designed to be normally activated in the absence of the operator. (Z267-00 5.8.3)
4.6. Machine Guarding requirements per F2291-21 13.5
4.7. Fencing, Guardrails, Handrails, Gates and Walkways requirements per F2291-21 section 14
4.8. Fasteners requirements per F2291-21 section 16
4.9. Welding requirements per F2783-20 section 5.3.4 and 5.4.10
4.10. Signage shall meet F2291-21 Section 6.7
4.11. Coatings shall meet F2291-21 Section 19
4.12. Sanitation/Disinfection shall meet F2291-21 Section 21

5. Structural Requirements

5.1. Critical parts list shall be submitted including inspection and replacement criteria
5.2. NDT report(s) shall be provided for critical components subject to fatigue, vibration and/or environmental factors (see also D.O. 534/18 Additional Inspection Requirements for Corrosion of Aging Rides)

6. Electrical Requirements

6.1. Ontario Electrical Safety Code as amended from time to time.
6.2. Emergency stop circuits shall be energized systems that are fail-safe in case of power failure (Z267 5.5.2). (Shunt trip alone does not meet this requirement)
6.3. The emergency stop switches shall be of manually reset type. The resetting of the stop switch shall not start the ride.
6.4. The occurrence of a single ground or the failure of any single:
a) switch which does not have contacts that are positively mechanically separated,
b) relay / contactor,
c) solid state device (including software system, drive system (motor/motion controller)
d) shall not prevent the ride from stopping, cause the ride to start, or overspeed.

6.5. Where the operator has direct, unrestricted access (single human action/readily accessible) to the main disconnect, the emergency stop circuit does not require compliance to 6.4.
6.6. Operator controls shall be located within easy reach of the operator when the operator is in a position to observe the ride while the ride is in operation.
6.7. Operator controls shall be designed to avoid unintentional activation and unauthorized access. (e.g. on/off key or keyed e-stop, start is covered/collar/shrouded/2nd start button/operator presence detection) (O. Reg. 221/01 15.6 (c))
6.8. Operator controls shall be identified as to their function (all switches, buttons, dials labelled).
6.9. Ride duration shall be limited by time (electrical timer) or operator presence detection (foot/finger/hand/lanyard) operated device.
6.10. Devices with terminal stops shall have redundant methods to slowdown (decelerate) at terminals
6.11. All operator controls or parts, or both, relating to protection shall be tested daily.
6.12. All circuits or parts, or both, relating to protection in the event of failure shall be tested at each setup and monthly to determine that they function in accordance with 6.4. Testing procedures shall be included in the technical dossier.

7. Background

Amusement rides and devices that are new to Ontario are required to be submitted as a New Installation in Ontario regardless of the age of the device. For example, a carousel that was designed and manufactured in 1980 that has never had a permit in Ontario will be considered a New Installation in the current year if an owner wishes to operate in the province. The current regulations and code adoption document (CAD) require new installations to meet the current adopted codes and standards regardless of the age of the device. This requirement poses a challenge for owners and submitting engineers wishing to bring an old ride to Ontario as new.

TSSA has adopted the ASTM F24 standards in 2019. As an alternative, this Guideline can be used to submit devices under category Simple or Medium manufactured prior to January 1, 2012 and submitted now as new installation.

The requirements in this guideline are based on CSA Z267, O. Reg 221/01 and the CAD prior to adoption of ASTM F24 set of standards for Simple and Medium Rides (See AD 542/21). Complex rides will require compliance to currently adopted F24 code because of the diversity of complex rides and unknown alterations that could occur in the future, F24 is better suited to cover these rides.

Roger Neate.
Director, Ontario Regulation 209/01 (Elevating Devices), appointed under the Technical Standards & Safety Act, 2000

ANNEX A:
Checklist for Simple and Medium Amusement Rides or Devices Manufactured Prior To January 1, 2012
(Alternative to F24 Requirements applicable at date of dossier submission)

CHECKLIST FOR RIDES MANUFACTURED PRIOR TO JANUARY 1, 2012 per GUIDELINE AD 543/22			
Mechanical Requirements			Provided ?
	Requirement	Explanation (if required)	⇓⇓
4.1	Patron restraint, clearance envelope, and containment design criteria requirements shall meet F2291-21 section 6 or later versions		Y
4.2	Loads, Strength and Acceleration or Deceleration shall be assessed by Engineer using good engineering practice.		Y
4.3	Hydraulic Systems shall meet F2291-21 section 9		Y
4.4	Pneumatic Systems shall meet F2291-21 section 10		Y
4.5	Brakes shall meet F2291-21 section 13.7 and: a. Where appropriate, energized critical braking systems shall remain activated in the event of power failure. (Z267-00 5.8.2) b. Where appropriate, operator-monitored braking systems shall be designed to be normally activated in the absence of the operator. (Z267-00 5.8.3)		Y
4.6	Machine Guarding requirements per F2291-21 13.5 or later editions		Y
4.7	Fencing, Guardrails, Handrails, Gates and Walkways requirements per F2291-21 section 14 or later editions.		Y
4.8	Fasteners requirements per F2291-21 section 16 or later editions.		Y
4.9	Welding requirements per F2783-20 section 5.3.4 and 5.4.10 or later editions		Y
4.1	Signage shall meet F2291-21 Section 6.7		Y
4.11	Coatings shall meet F2291-21 Section 19		Y
4.12	Sanitation/Disinfection meets F2291-21 Section 21		Y

CHECKLIST FOR RIDES MANUFACTURED PRIOR TO JANUARY 1, 2012 per GUIDELINE AD 543/22			
Structural Requirements			Provided ?
	Requirement	Explanation (if required)	⇓⇓
5.1	Critical parts list shall be submitted including inspection and replacement criteria		Y
5.2	NDT report(s) shall be provided for critical components subject to fatigue, vibration and/or environmental factors (see also D.O. 534/18 Additional Inspection Requirements for Corrosion of Aging Rides)		Y

Checklist for Simple and Medium Amusement Rides or Devices Manufactured Prior To January 1, 2012 (Alternative to F24 Requirements applicable at date of dossier submission)

CHECKLIST FOR RIDES MANUFACTURED PRIOR TO JANUARY 1, 2012 per GUIDELINE AD 543/22			
Electrical Requirements			Provided ?
	Requirement	Explanation (if required)	⇓⇓
6.1	Ontario Electrical Safety Code as amended from time to time.		Y
6.2	Emergency stop circuits shall be energized systems that are fail-safe in case of power failure (Z267 5.5.2). (Shunt trip alone does not meet this requirement)		Y
6.3	The emergency stop switches shall be of manually reset type. The resetting of the stop switch shall not start the ride.		Y
6.4	The occurrence of a single ground or the failure of any single: a. switch which does not have contacts that are positively mechanically separated, b. relay / contactor, c. solid state device (including software system, drive system (motor/motion controller) shall not prevent the ride from stopping, cause the ride to start, or overspeed.		Y
6.5	Where the operator has direct, unrestricted access (single human action/readily accessible) to the main disconnect, the emergency stop circuit does not require compliance to 6.4.		Y
6.6	Operator controls shall be located within easy reach of the operator when the operator is in a position to observe the ride while the ride is in operation.		Y
6.7	Operator controls shall be designed to avoid unintentional activation and unauthorized access. (e.g. on/off key or keyed e-stop, start is covered/collar/shrouded/2nd start button/operator presence detection) (O. Reg. 221/01 15.6 (c))		Y
6.8	Operator controls shall be identified as to their function (all switches, buttons, dials labelled).		Y
6.9	Ride duration shall be limited by time (electrical timer) or operator presence detection (foot/finger/hand/lanyard) operated device.		Y
6.1	Devices with terminal stops shall have redundant methods to slowdown (decelerate) at terminals		Y
6.11	All operator controls or parts, or both, relating to protection shall be tested daily.		Y
6.12	All circuits or parts, or both, relating to protection in the event of failure shall be tested at each setup and monthly to determine that they function in accordance with 6.4. Testing procedures shall be included in the technical dossier.		Y