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TRUCK FALL PROTECTION COMPANY LLC

ROPE SYSTEM DOWNWARD DEFLECTION EVALUATION TEST

SCOPE OF WORK:
CLIENT REQUEST, WITH REFERENCE TO OSHA 1910.29, FALL PROTECTION SYSTEMS AND FALLING OBJECT PROTECTION – CRITERIA AND PRACTICES, DATED MAY-05-2021 ON ONE GUARDRAIL SYSTEM

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RT-L-AMER-DET-005 (Oct 17, 2022)

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SAMPLE DISPOSITION:

After testing, the samples were returned to the client for further evaluation.

ROPE SYSTEM DOWNWARD DEFLECTION EVALUATION TEST:

Date Received: JUN-13-2024
Dates Tested: JUN-13-2024
Location Tested: Intertek – Plymouth, Michigan

DESCRIPTION OF SAMPLES:

Part Description: Guardrail System

TEST EQUIPMENT:

ASSET #	DESCRIPTION	MANUFACTURER	MODEL #	SERIAL #	CAL DUE
160692	LOAD CELL	LEBOW	3173-500	3136	NOV-03-2024
373-345	DATA ACQ/SWITCH UNIT	KEYSIGHT	34972A	MY49030676	SEP-26-2024
373-852	DC POWER SUPPLY	BK PRECISION	1694	258BB21128	*VBU
373-916	TAPE MEASURE	MILWAUKEE	48-22-6630	4524249939	NOV-09-2024

**VBU = Verified before use.*

TEST PROCEDURE:

Test Method:	Per client request, with reference to OSHA 1910.29, Fall protection systems and falling object protection – criteria and practices, Dated MAY-05-2021
Number of Samples:	One Guardrail System

The left side of the guardrail system underwent testing according to a few select acceptance criteria set by OSHA 1910.29 standards. These criteria are included in the Acceptance Criteria section of this report.

The customer secured the guardrail system onto a flatbed truck's trailer, locking the wheels to prevent rolling. A ratchet strap was attached to the tested guardrail to apply the requested test loads. A Servo motor and a hi-lo truck were used for this purpose. The test load was measured using a load cell and pulley system.

- The top-left guardrail was pulled downwards with a force of 200 lbf.
- The middle-left guardrail was pulled downwards with a force of 150 lbf.

Additionally, the change in height during downward pulls was measured using a calibrated measuring tape. Testing was conducted under laboratory ambient conditions, with a temperature range of (23 ± 5) °C and relative humidity between 25% and 75%.

ACCEPTANCE CRITERIA:

1910.29(b)(3)	Guardrail systems are capable of withstanding, without failure, a force of at least 200 pounds (890 N) applied in a downward or outward direction within 2 inches (5 cm) of the top edge, at any point along the top rail.
1910.29(b)(4)	When the 200-pound (890-N) test load is applied in a downward direction, the top rail of the guardrail system must not deflect to a height of less than 39 inches (99 cm) above the walking-working surface.
1910.29(b)(5)	Midrails, screens, mesh intermediate vertical members, solid panels, and other intermediate members are capable of withstanding, without failure, a force of at least 150 pounds (667 N) applied in any downward or outward direction at any point along the intermediate member.

RESULTS:

1910.29(b)(3)	The top rail did not fail when subjected to an applied load of 200 lbf in the downward direction.
1910.29(b)(4)	The initial height of the guardrail was 39 inches above the walking-working surface. However, at a test load of 200 lbf, the guardrail height decreased to 37¾ inches above the walking work surface. This deflection does not meet the acceptance criteria, which require the top of the guardrail system to remain at a minimum height of 39 inches above the walking-working surface. To comply with the criteria, the customer plans to raise the top guardrail by a minimum of 3 to 4 inches. This adjustment will bring the system within acceptable limits, and no retest will be necessary, provided the rest of the system remains consistent in construction.
1910.29(b)(5)	The midrail did not fail when subjected to an applied load of 150 lbf in a downward direction. The starting height of the midrail was 19½ inches above the walking-working surface. Under the test load of 150 lbf, the midrail height decreased to 17½ inches above the walking-working surface.

APPENDICES:

Appendix A – Test Data
Appendix B – Photographs

REPORT AUTHORIZED PER ISO 17025:2017

When signed with physical or electronic signature, the contents of this report have been prepared and approved per Intertek's quality process in accordance with ISO 17025. This lab is accredited to ISO 17025 by A2LA under scopes 0078.04 & 0078.05.

Ayman Mannan
Engineer, Performance

Douglas Berlin
Engineer, Team Leader

APPENDIX A – TEST DATA

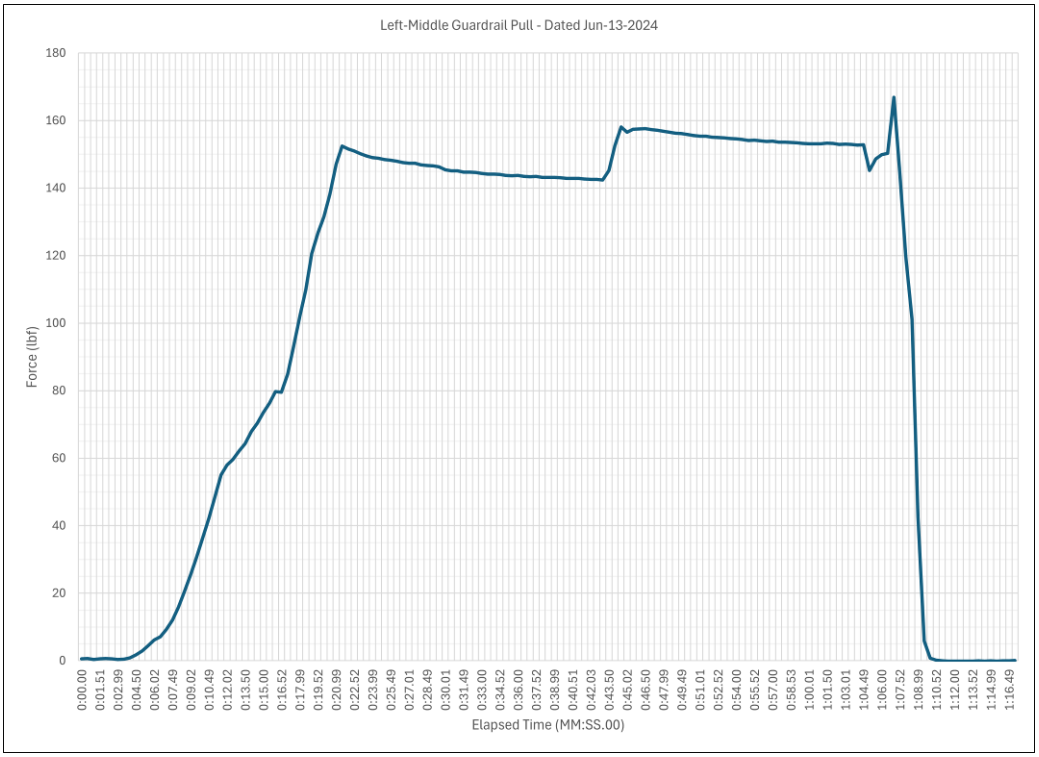

Figure 1: Middle Guardrail Perpendicular/Downward Pull to 150 lbf

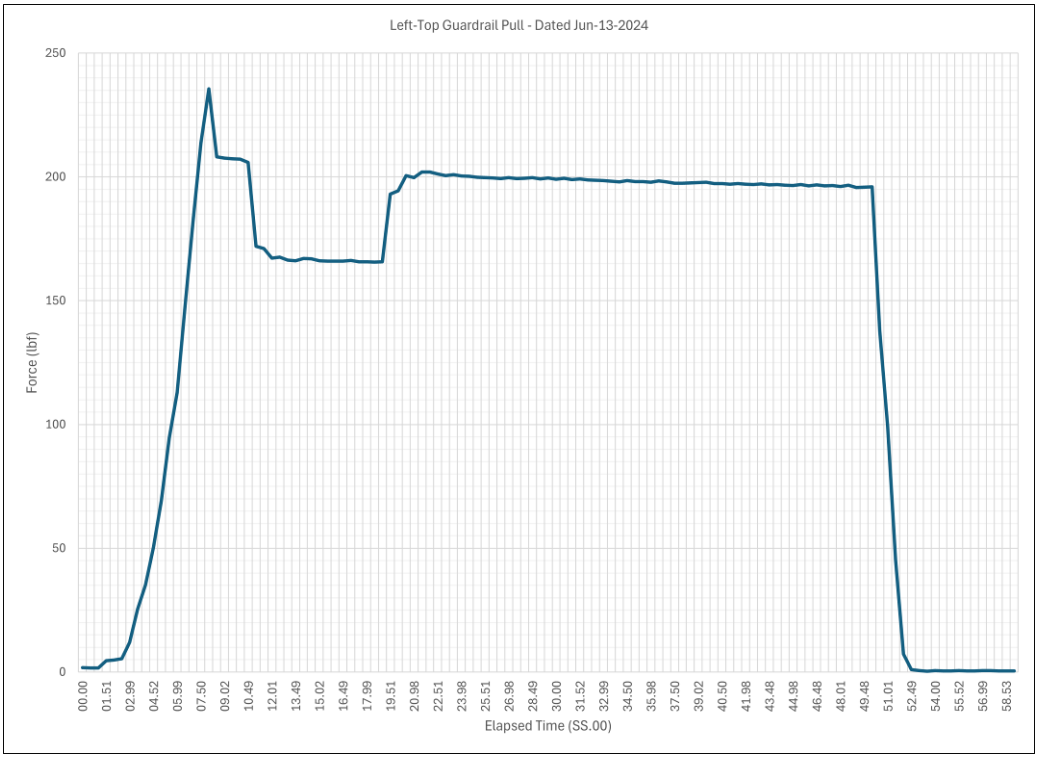

Figure 2: Top Guardrail Perpendicular/Downward Pull to 200 lbf

APPENDIX B – PHOTOGRAPHS

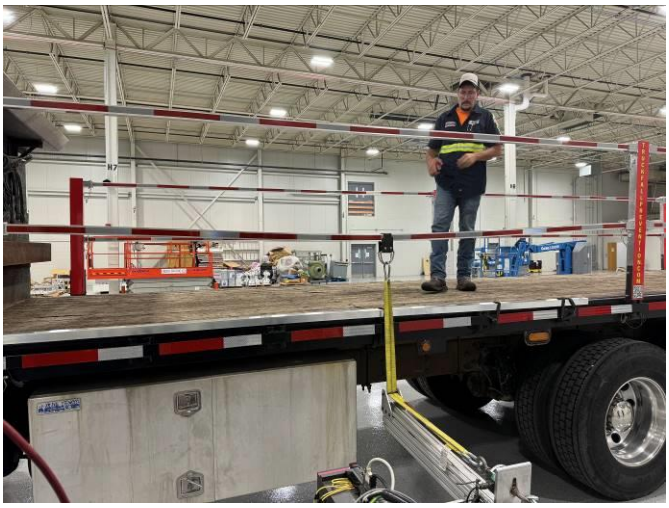

Figure 3: Midrail Under Load

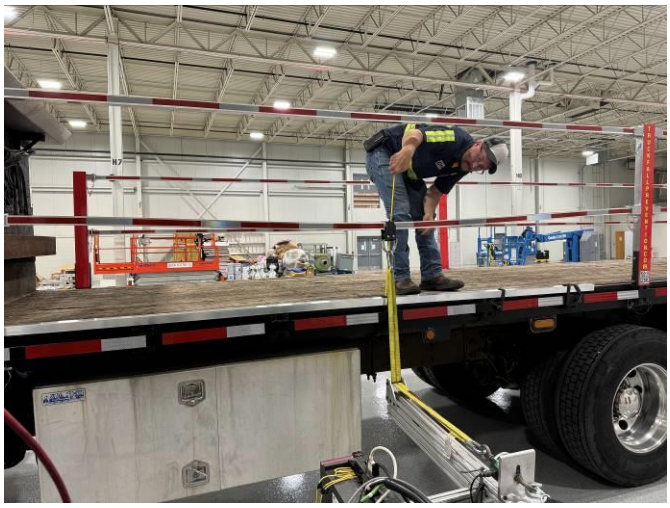

Figure 4: Midrail Measurement

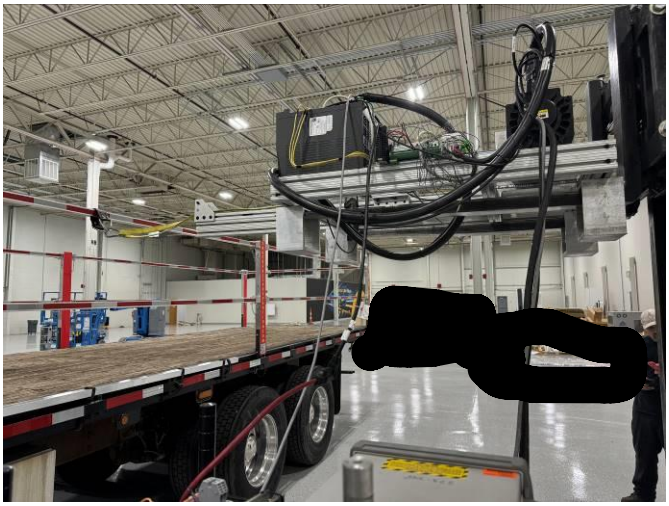

Figure 5: Top Rail Pre-Load Outward

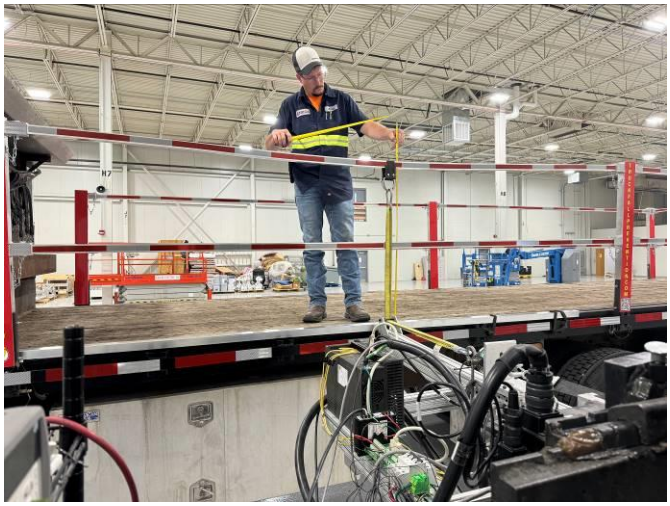

Figure 6: Top Rail Under Downward Load Measurement