

Engineering Specification

ORCA™ Steel Deck Truck Scale

The following specifications describe a fully electronic, low-profile, modular steel deck truck scale system. The scale will be designed for installation on above-ground piers, slabs, or pit foundations and shall be suitable for applications requiring long-term reliability, precision, and ease of relocation.

1.0 General Provisions – Truck Scale

The truck scale shall be a fully electronic, low-profile, modular steel deck design. The scale platform shall meet the following minimum standards.

1.1 Scale Capacity and Certification:

- The truck scale shall have a capacity of up to 100 tons (220,000 lbs) and a Concentrated Load Capacity (CLC) of 50 tons (110,000 lbs). The scale must be certified by **Measurement Canada** for legal-for-trade applications, and the manufacturer must comply with all relevant regulatory requirements.

1.2 U-Channel Orthotropic Design with Bottom Plating:

- The scale must feature a **U-channel orthotropic design** with continuous bottom plating. This configuration provides a high strength-to-weight ratio, improved load distribution, and reduced deflection, enhancing resistance to fatigue and wear in heavy-load applications.

1.3 Cross-bracing and Pre-cambering:

- The truck scale shall incorporate **dual cross-bracing** to increase torsional rigidity and reduce lateral deflection. The weighbridge sections shall be **precambered** to prevent long-term deformation and water pooling on the deck surface, which helps maintain accuracy over time.

1.4 Treadplate Options:

- The deck shall include a **½-inch** or **3/8-inch** diamond-pattern treadplate, depending on project specifications. These thickness options provide superior durability and wear resistance in high-traffic environments.

1.5 Swivel-Bracket Installation:

- The scale shall feature a **swivel-bracket installation system** with **bolt-free connections** between scale sections to simplify installation and ensure structural integrity in the long term. This system shall be designed to reduce installation time and minimize field connections.

2.0 Load Cells and Mounting

The truck scale shall include high-capacity load cells mounted in a durable, debris-free environment to ensure consistent accuracy.

2.1 Load Cell Specifications:

- Each load cell shall have a minimum capacity of 75,000 lbs, with a 150% overload safety factor. Load cells shall be constructed from 4340 alloy steel and sealed to a minimum rating of IP67 for protection against environmental elements.

2.2 Suspension System:

- The scale shall utilize a **center-pivot suspension system**, capable of tolerating up to 15° of natural inclination. This system shall resist shock loading and eliminate the need for check rods, reducing potential failure points.

2.3 Galvanized Steel Conduit System:

- The load cell cables shall be protected by **galvanized steel conduits** to prevent damage from environmental exposure. The cable management system shall ensure that cables remain free from moisture and debris to maintain accurate weighments over time.

3.0 Surface Treatment and Coating

The truck scale shall undergo a thorough surface preparation and coating process to ensure long-term durability and protection against corrosion.

3.1 Shot Blasting:

- The scale structure shall be **shot-blasted** to meet **ISO 8501 Sa2.5 standards**, removing any contaminants such as grease, rust, and mill scale to ensure proper paint adhesion.

3.2 Dual-Layer High-Solids Epoxy Coating:

- The scale shall be coated with a **dual-layer high-solids epoxy** for long-term protection. The coating process shall be completed in a controlled environment to provide uniform coverage and resistance to moisture, chemicals, and abrasion.

3.3 Continuous Welds:

- All structural welds shall be **continuous** along the entire length of the joints to minimize moisture ingress and provide additional protection against corrosion. Continuous welds shall ensure that the weighbridge maintains structural integrity in demanding environments.

4.0 Optional Features

- **Portable Options:** The scale may be outfitted with subframes to allow for easy disassembly and transport, suitable for portable or temporary installations.
- **Safety Guiderails:** Optional bolt-on safety guiderails with gusseted supports shall be available for vehicle safety.
- **Man-Liftable Cover Plates:** Load cell access cover plates shall be **man-liftable** to facilitate easy access during maintenance without the need for heavy equipment.

5.0 Certification and Warranty

The truck scale shall be certified by **Measurement Canada** for legal-for-trade use. Load cells and electronics shall be warranted for a minimum of two years against failure due to manufacturing defects or environmental damage.

6.0 Electronics

6.1 Load Cell Certification and Specifications:

- Load cells used in the truck scale system shall be certified to either **NTEP 1:10,000 Class IIIL, Multiple Cell** or **OIML MAA C3, Y=7500** standards, ensuring compliance with legal-fortrade accuracy and performance requirements.
- Load cells must be **analog** to promote interchangeability and ensure compatibility with various systems, allowing for easier replacements and upgrades.
- **Double-ended beam load cells** shall be used to provide superior reliability and performance, ensuring long-term stability and accuracy. The use of **canister/rocker column load cells**, which require bumper bolts and checking rods for alignment, is not permitted due to their reduced reliability and higher maintenance requirements.

6.2 Manufacturer Certification:

- The manufacturer of the scale (supplier) shall be **ISO 9001** certified and comply with the **VCAP (Verified Conformity Assessment Program)** as administered by the NCWM (National Council on Weights and Measures) to ensure consistent quality control and regulatory adherence.

6.3 Remote Display:

- The remote display shall feature a **5-inch tall LED screen** capable of displaying up to 6 digits. The display must include **green/red lights** for clear status indication.

- The enclosure shall be constructed from **powder-coated steel** for durability and designed with **screw-free access** to internal components, allowing for easy servicing and maintenance.

6.4 Junction Box:

- The junction box shall be constructed from **fiberglass** and equipped with a **Gore-Tex breather** to prevent condensation buildup, ensuring longevity and reliability in various environmental conditions.
- The junction box must support **individual/section trimming** to allow for precise calibration of each section of the scale, ensuring accurate weight measurements across the entire weighbridge.
- The enclosure shall meet **IP67** standards and have a minimum rating of **NEMA 6**, providing protection from dust, moisture, and other environmental hazards.