

METTLER TOLEDO



STATIC SCALE SPECIFICATIONS

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General Provisions Static Scale

- 1.0 Static scales and WIM (Weigh-In-Motion) shall be of one manufacturer to maximize compatibility and availability of components.
- 1.1 Furnish and install one pit type multi-platform concrete deck motor truck scale and associated electronic controls.
- 1.2 The scale shall have a clear and unobstructed overall weighing surface of not less than 76 feet long and not less than 12 feet wide (other sizes available).
- 1.3 The scale shall be designed to perform as a multi-platform scale with platform sizes of 12 ft. x 12 ft., 24 ft. x 12 ft., and 40 ft x 12 ft. to provide individual axle grouping weights and a total gross vehicle weight. The scale shall be fully electronic in design and shall not incorporate any mechanical weighing elements, check rods, or check stays.
- 1.4 The scale shall have a nominal capacity of 200,000 pounds graduated in 20-pound increments.
- 1.5 The scale shall have a dual tandem axle capacity (two axles spaced 48 in. apart) of 70,000 pounds and shall be designed to provide a fatigue life of 20 years.
- 1.6 The load cells, load cell mounting hardware, and junction boxes shall be constructed of stainless steel. The cables shall be stainless steel sheathed.
- 1.7 The scale shall meet the requirements set forth by the current edition of the National Institute of Standards and Technology Handbook 44 (NIST H-44). The scale manufacturer shall provide a Certificate of Conformance (NTEP Certification) to these standards upon request.
- 1.8 The design and manufacture of the scale weighbridge, load cells, digital instrument, and associated accessories shall be of one manufacturer as to maximize compatibility and availability of components. This manufacturer shall have a quality system that has been registered to the standards of ISO9001.
- 1.9 The manufacturer shall provide with the bid proposal a listing of major spare parts and corresponding prices including, but not limited to, replacement load cells digital instrument, printer, and junction box circuit boards.
- 1.10 The Static Scale System as described herein shall be manufactured with hardware including printed circuit boards and software that is interchangeable with the State of _____s _____ and _____ weigh stations. This allows the State to control inventory of replacement parts, and allows the operators to change work locations without being retrained.
- 1.11 The scale shall be a Mettler Toledo Scale Type Model 7541 or approved equal.

SCALE FOUNDATION REQUIREMENTS

- 2.0 The foundation shall meet local requirements and the minimum specifications stated in this section.

- 2.1 The minimum soil bearing required shall be 1,500 pounds per square foot. The buyer shall be responsible for determining whether or not the soil conditions are adequate.
- 2.2 The foundation shall be a pit type design.
- 2.3 The pit shall provide a minimum of 48 inches of clearance from the pit floor to the bottom flange of the main girders.
- 2.4 Site accommodations must be made to promote proper drainage away from the scale/foundation.
- 2.5 The foundation shall be poured and constructed of concrete with a minimum strength of 4,000 psi at a 28-day cure with 5 to 7% air entrainment.
- 2.6 The foundation shall be reinforced in all load-bearing areas.
- 2.7 The foundation shall be constructed to provide drainage.
- 2.8 The foundation shall be designed to include an approach on each end of the scale in accordance to the guidelines of NIST H-44.

WEIGHBRIDGE SPECIFICATIONS

- 3.0 The scale weighbridge shall be capable of weighing trucks that have dual tandem axle weights (4' minimum between dual axles and at least 10' from next axle) of up to 70,000 pounds.
- 3.1 The weighbridge shall consist of prefabricated modules designed for the use of a field poured concrete deck with a minimum thickness of 10" and two mats of reinforcing steel (rebar).
- 3.2 All weighbridge welding must be performed by welders with current AWS D1.5 certification.
- 3.3 The weighbridge main girders shall be a minimum of WF24X68. The cross channels shall be a minimum of C8X11.5, and the end cross members shall be a minimum of W12X35.
- 3.4 Three (3) manholes shall be included with the scale for pit access with one manhole to be placed in each of the independent scale platforms.
- 3.5 The scale weighbridge assemblies shall incorporate no bolted connections between the load cell and weighbridge assemblies.
- 3.6 The independent scale weighbridge platforms shall be coupled together with fixed distance/zero moment transfer links.
- 3.7 Each independent scale weighbridge platform shall be checked against check brackets attached to embedded foundation steel. Check rods are not acceptable.
- 3.8 The load cell base plates shall have a minimum thickness of 1" and shall be anchored to the scale foundation.

SURFACE PREPARATION AND FINISH

- 4.1 The weighbridge shall be shot blasted to a minimum SSPC-B-SP6 specification prior to painting.
- 4.2 All exterior surfaces of the scale shall have a two-part epoxy finish of Carboline LO15, or equal, providing a total Dry Film Thickness of 6-8 mils.

LOAD CELL SPECIFICATIONS

- 5.0 Each load cell shall have a minimum capacity of 45 metric tons (100,000 pounds).
- 5.1 Load cells shall be certified by NTEP and meet the specifications as set forth by NIST H-44 for Class IIII devices. A Certificate of Conformance to these standards shall be provided by the manufacturer upon request.
- 5.2 Load cells shall be digital with an integral microprocessor and analog to digital conversion function located within the load cell housing.
- 5.3 Load cells shall output only converted digital information to the scale instrument. Analog output of signals from the load cell is not acceptable.
- 5.4 The load cell assembly shall be constructed to perform as a rocker pin and shall have no positive fixed mechanical connectors, such as bolts or links, that are required in mounting the load cell to the WeighBridge or foundation base plates.
- 5.5 The load cell shall not require check rods or chain links for stabilization.
- 5.6 The load cell shall be of stainless steel construction and hermetically sealed with a minimum NEMA 6P (submersible) rating.
- 5.7 The load cell shall have a positive lock quick connector integral to its housing for connecting and disconnecting the load cell interface cable at the load cell. The connector shall be of glass to metal pin type construction to maintain a hermetic seal.
- 5.8 Replacement of one load cell shall require a maximum of 3 minutes once in position at the load cell with a jack (and blocks if required).
- 5.9 The load cell shall have the following specifications:
 - 5.9.1 V_{\min} pounds maximum
 - 5.9.2 Hysteresis $\pm 0.025\%$ of full scale
 - 5.9.3 Non-Linearity $\pm 0.015\%$ of full scale
 - 5.9.4 Creep (30 minutes) $\pm 0.017\%$ of applied load
 - 5.9.5 Temperature Range -10 C - +40C
- 5.10 The load cell interface cable shall be stainless steel sheathed for environmental and rodent protection.
- 5.11 The load cell shall have a minimum five-year warranty against defects in materials and workmanship. The warranty shall cover all costs associated with replacement parts and on-site labor.
- 5.12 Load cells shall be Mettler-Toledo, Inc. DigiTOL® POWERCELL or approved equal.

Scale Instrument Specifications

- 6.0 The scale instrument shall be NTEP approved and meet or exceed the specifications set forth by NIST H-44 for Class II, III, and IIII Devices. A Certificate of Conformance to these standards shall be provided by the manufacturer upon request.
- 6.1 The scale instrument shall be housed in an enclosure that is suitable for desktop mounting.

- 6.2 The scale instrument shall be capable of performing calibration, span, zero, and shift adjustment through software calculations that require no in scale adjustment.
- 6.3 The scale instrument shall use English language prompts to lead the start-up personnel through all phases of set-up, calibration, and testing. Entry of information shall be accomplished through a QWERTY keyboard.
- 6.4 The scale instrument shall be capable of communicating with up to 24 digital load cell assemblies that may be partitioned as one or two scales.
- 6.5 The scale instrument shall be capable of full digital filtering of the weight information sent from the load cells and updating the instrument's weight display 18 times per second.
- 6.6 The scale instrument shall only receive digital information from the load cell assemblies. There shall be no analog to digital conversion function in the scale instrument or in junction boxes between the load cell and the scale instrument.
- 6.7 The scale instrument shall be capable of assigning each load cell with its own unique identification number and shall be capable of displaying the weight reading of each individual load cell through the instrument without disconnecting any of the load cells from the system.
- 6.8 The scale instrument shall communicate with each individual load cell and shall display an error code immediately in the event of a load cell failure. This error code shall identify the failed load cell and the cause of the failure.
- 6.9 The operator shall be able to enter up to 20 alphanumeric comments through the QWERTY keyboard.
- 6.10 The scale instrument shall have gross/net weight switching and the ability to recall the gross or tare weights in the net mode.
- 6.11 The scale instrument shall be capable of being programmed and calibrated in pounds or kilograms.
- 6.12 The scale instrument shall have a standard communication port configured in bit serial ASCII, bi-directional, RS232C, or 20mA current loop. The port shall be selectable for on demand or continuous communications at up to 9600 baud. The port shall be capable of receiving a remote print command via serial communication or hard wire input.
- 6.13 The scale instrument shall have a standard second data output port in the future that is capable of being configured in a bit serial ASCII, bi-directional, RS232C, 4 wire RS522, or 2 wire RS485, format with up to 9600 baud communications rates.
- 6.14 The scale instrument shall have a transaction counter to automatically assign sequence numbers to transactions.
- 6.15 The scale instrument shall have output the following
 - 6.15.1 Gross, Tare, and Net Weight
 - 6.15.2 20 character alphanumeric comment
 - 6.15.3 Transaction Counter
 - 6.15.4 Time and Date
- 6.16 The scale instrument shall be capable of being programmed for sign corrected net weighing so that all net weights are positive.

- 6.17 The scale instrument shall have automatic zero capture on power-up selectable to capture zero at a range of the full-scale capacity.
- 6.18 The scale instrument shall have a programmable power-up selectable to capture zero at a range of the full-scale capacity.
- 6.19 The scale instrument shall have adjustable digital filtering.
- 6.20 The scale instrument shall have adjustable automatic zero maintenance selectable for a range of displayed increments.
- 6.21 The scale instrument shall have push-button zero selectable for a range of full-scale capacity.
- 6.22 Tare, Zero, and Print from the scale instrument shall provide remote diagnostics and have the ability to email or page a service technician when unusual situations or error code appear.
- 6.23 The scale instrument shall provide remote diagnostics and have the ability to email or page a service technician when unusual situations or error code appear.

7.0 Static Scale Computer:

The computer shall be a 100 percent IBM compatible Pentium microprocessor-based microcomputer. Acceptable brands are IBM, Compaq or Dell.

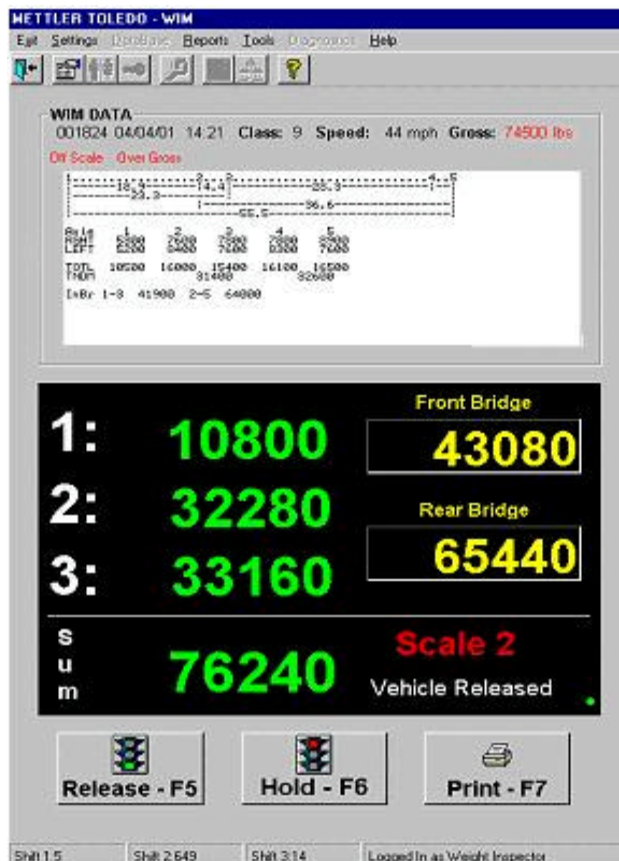
Minimum Specifications for Static Scale Computer:

- 7.1 Pentium microprocessor rated at a *minimum of 500 MHz*.
- 7.2 126 Mbytes RAM or greater.
- 7.3 *Minimum of 10 GB* hard drive.
- 7.4 *Minimum of 32X* CD-ROM drive.
- 7.5 1.44 MB high-density diskette drive.
- 7.6 Minimum of three full-sized 8/16 bit and two half-sized 8/16 bit slots.
- 7.7 Parallel interface for connection to the printer.
- 7.8 17" SVGA 26 dp monitor with non-glare screen.
- 7.9 101 key enhanced keyboard.
- 7.10 Real-time clock/calendar with battery backup.
- 7.11 Power supply as required by system configuration.
- 7.12 System utilities and diagnostic software.
- 7.13 Interface to the WIM electronics enclosure.
- 7.14 Interface to digital outputs.
- 7.15 High-speed analog to digital converter.
- 7.16 Surge protection.
- 7.17 Internal modem card compatible with V.32 standards (56 K full duplex) or greater.
- 7.18 System password protected lock for user access restriction.
- 7.19 All access ports, cables and accessories to provide a working system.

Static scale computer shall provide the following functions:

- 7.20 The Static scale computer shall interface with the static scale indicator and the WIM terminal.
- 7.21 The static scale computer shall display all static scale weights and display the WIM data for the vehicle that is positioned on the static scale.
- 7.22 The static scale computer shall also display the inner bridge values.

- 7.23 Each static scale platform weight and inner bridge weight shall have adjustable thresholds.
- 7.24 The static scale computer shall automatically determine bridge threshold based axle spacing.
- 7.25 The static scale computer shall automatically check weights to thresholds and release vehicle or alert operator of violation (audio and visual alerts).
- 7.26 The static scale computer shall be the main operator interface for both the static and WIM scales.
- 7.27 The static scale computer shall continuously update WIM calibration based on static weights.
- 7.28 The static scale computer shall provide local and remote diagnostics for static scale indicator and load cells.
- 7.29 The static scale computer shall display static and WIM data in a format similar to the following and provide the following features:
- Selectable auto release
 - Accumulate axles
 - Display shift counts
 - Password Protected
 - Violations shall be displayed in red



JUNCTION BOXES AND CABLES

- 8.0 All junction boxes shall be NEMA 4X rated (constructed of stainless steel).
- 8.1 Load cell and scale platform to scale instrument cables shall be stainless steel sheathed for environmental and rodent protection.

LIGHTNING PROTECTION SPECIFICATIONS

- 9.0 A comprehensive lightning protection system shall be provided with the scale.
- 9.1 The system shall not require complicated wiring or devices to provide this protection.
- 9.2 Major scale components including load cells, scale instrument, and printer shall be included in the lightning protection system.
- 9.3 Grounding of all scale components including load cells, scale instrument, printer, and accessories shall be to one common point. Multiple ground point systems are not acceptable.
- 9.4 An AC line surge protector shall plug into a common electrical outlet and have receptacles for the scale instrument, ticket printer, and other scale accessories.
- 9.5 Each AC line surge protector required shall have isolated grounding, hospital grade duplex receptacles, and an internal 15-amp circuit breaker.
- 9.6 Verification of lightning protection system performance shall be available in writing from the manufacturer upon request.

STATIC SCALE WARRANTY

- 10.1 All construction work and materials are warranted against defects in material or workmanship for a period of five years from the date of completion of all work. Bidder shall promptly correct any such defect appearing within the warranty period.
- 10.2 The scale manufacturer shall warrant the scale assembly including all load cells, scale instrument, printer, junction boxes, cables, and accessories for a period of five years from the date of installation from failures due to a defect in manufacturing, workmanship, lightning, or surge voltages. This work shall be performed within 24 hours of notification.
- 10.3 The manufacturer shall bear the charges and expenses associated with replacement parts, equipment, on-site labor, and any associated freight or handling expenses incurred in the repair or replacement of the scale assembly due to failed or damaged items under warranty.
- 10.4 The manufacturer and/or its local representative shall present a program of regular maintenance and calibration service, including the associated inspection costs. Inspection shall occur at a minimum of once every six months and shall comply with the guidelines set forth by the manufacturer, local regulations, and NIST H-44.