Cardinal®
Cardinal Scale Manufacturing Co.

ENGINEERING SPECIFICATIONS

Guardian Steel Deck Motor Truck Scale
40 Ton CLC Cardinal EPR Scale
with Hydraulic Load Cells

GENERAL PROVISIONS:

Furnish and install one steel deck platform motor truck scale and associated electronic controls.

The scale shall have a clear and unobstructed weighing surface of not less than 50 feet in length by 11 feet in width.

The scale shall be fully hydraulic load cell design and shall incorporate a restraint system that limits the motion of the deck.

The scale shall be designed to perform as a single weighing platform and shall be of flat top design.

The scale shall have a gross weighing capacity of 80 tons and shall have a concentrated load capacity of 40 tons.

The scale shall be designed to accept vehicles which generate up to 80,000 pounds per tandem axle.

The scale shall be calibrated 160,000 pounds by 20 pound increments.

Load cells shall be constructed of stainless steel.

The scale must have no more than eight load cells.

The scale shall be NTEP certified and shall meet the requirements as set forth by the National Institute of Standards and Technology Handbook 44 current edition for class IIIL devices. The scale manufacturer shall provide a Certificate of Conformance to these standards. Provisional certification will not be accepted.

The design and manufacture of the scale weighbridge, load cells, digital instrumentation, and associated accessories shall be one manufacturer to maximize compatibility and availability of components.

The manufacturer shall provide with the bid proposal a listing of major spare parts and their prices including but not limited to, replacement load cells, pressure transducers, weight indicator, circuit boards and associated accessory parts.

The scale shall be a Cardinal Model H8050-EPR or equal.

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SCALE FOUNDATION REQUIREMENTS:

The foundation shall meet all local requirements and the minimum specifications as stated in this section.

The minimum soil bearing capacity shall be 3,000 psf.

The foundation shall extend to the frost line at the load cell piers. The areas between the load cell piers are not load bearing and are for cover.

The foundation shall provide a minimum of 3 inches of clearance to the weighbridge.

The approach slab shall be a maximum of 15 ½ inches above the pier.

The foundation shall be constructed of concrete with a minimum strength of 3,000 psi.

The foundation shall be reinforced in all load-bearing areas. The reinforcing steel shall be 60 KSI yield strength and conform with ASTM A615 grade 60, minimum.

The entire foundation shall be tied together by a minimum of 6 inch x 6 inch , 10 gauge woven wire mesh, which shall cover the entire length and width of the foundation.

The foundation shall be constructed to provide positive drainage away from the foundation.

The foundation shall be designed to include two approaches, one at each end of the scale in accordance with local regulations and the guidelines of the National Institute of Standards and Technology Handbook 44, current edition.

WEIGHBRIDGE SPECIFICATIONS:

The scale weighbridge shall be capable of weighing trucks having a tandem axle weight of up to 80,000 pounds.

The weighbridge shall consist of three prefabricated steel deck modules.

The weighbridge shall allow top access to load cells. The deck modules are to be designed with a “no-bolt” connection.

All required load cells, hydraulic totalizer, interconnecting tubes and weight indicator shall be furnished and installed at the job site.

There shall be no bolted connections between the load cell and the weighbridge assemblies.

SURFACE PREPARATION AND FINISH:

The structural steel is shot blasted to an SSPC-SP6 condition to remove rust and mill scale, then protected with a baked-on epoxyde cross-linked polyester anticorrosion tan powder paint for the highest quality.

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LOAD CELL SPECIFICATIONS:

All load cells are to be of compression hydraulic type and shall have a minimum capacity of 50,000 pounds and a 150% safe overload rating.

Cardinal hydraulic load cells carry a lifetime warranty per Cardinal warranty terms.

Load cells shall be certified by NTEP and meet the specifications as set forth by the National Institute of Standards and Technology Handbook 44 for Class IIIL, multiple cells, 10,000 divisions. The manufacturer shall provide a NTEP Certificate of Conformance attesting compliance with these requirements.

Load cells shall output a hydraulic pressure signal to a corresponding pressure transducer at the totalizer junction box. Digital or analog electrical signals from the load cells are not acceptable. The outputs from the pressure transducers shall be electrically summed with provisions for adjustment of individual load cells provided. Totalizers employing the mechanical summation of load cell pressures are not acceptable.

Cardinal hydraulic load cells are warranted for the lifetime of the scale. This warranty reflects 100% replacement of the load cell, not inclusive of labor, and not subject to prorated costs to the customer. The warranty is in effect for the original purchaser/seller, and must be under continuing service contract from an authorized Cardinal Dealer from time of purchase. Lifetime warranty applies to damages resulting from water, lightning, and voltage transients and only applies to the hydraulic load cell structure itself (does not include pressure transducers, rubber seals, o-rings, and associated wiring).

The load cell assembly shall incorporate a compression element.

Temperature compensation shall take place within the pressure transducer circuitry.

The load cell shall be stainless steel and environmentally sealed to NEMA 6P / IP68.

The load cell shall be provided with sufficient tubing to reach the totalizer junction box.

Specifications

Overload, Safe	150%
Overload, Ultimate	300%
Output, Nominal	1800 psi
Pressure Transducer Output	1 mV/V
Temperature Range	
Compensated	-10 to +40 degrees C
Operating	-20 to +70 degrees C
Accuracy Class	IIIL
Capacity	50,000 pounds
V-min	3.8 pounds

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TOTALIZER JUNCTION BOX AND TUBING:

The totalizer junction box shall be mounted adjacent to the location for the weight-indicating instrument and shall be located such that it is exposed to the same ambient temperature as the scale and load cells. The totalizer enclosure shall be constructed of a corrosion proof non-conductive material.

The totalizer junction box shall hold the pressure transducers, load cell manifold, and associated tubing with provisions for bleeding each individual load cell hydraulic circuit of air.

The totalizer junction box shall provide sufficient strength to protect the internal components from physical damage.

The totalizer shall be designed for on-site service. It shall not be necessary to return the totalizer to the factory for service.

The totalizer shall allow for individual electronic load cell adjustment.

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SURGE VOLTAGE PROTECTION:

There shall be electrical isolation between the hydraulic tubes from the load cells and the load cell manifold / pressure transducer assembly.

WEIGHT INDICATOR:

The scale shall be provided with a weight indicator that is compatible with hydraulic load cells and employs appropriate compensation algorithms.

The weight indicator shall comply with the appropriate specifications for a Class IIIL, 10,000 divisions weight indicator as defined by National Institute of Standards and Technology, Handbook 44 latest edition and shall have a NTEP Certificate of Conformance attesting to that fact.

The weight indicator shall be a Cardinal 225 or 825.

WARRANTY REQUIREMENTS:

The scale manufacturer shall warrant the scale assembly including the deck and components below the deck for a period of five years; the digital weight indicator, printer and peripheral devices shall be covered for a period of one year or by the original manufacturer's warranty if not produced by the scale manufacturer.

The manufacturer or its local representative shall present a program of regular maintenance and calibration service. Inspection in said maintenance program shall occur a minimum of once every six months and shall comply with the guidelines set forth by the scale manufacturer, local regulations, and the current edition of the National Institute of Standards and Technology's Handbook 44.

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