Engineering Specification
Low Profile Steel Deck Truck Scale

The following set of specifications will describe a fully electronic, low profile, modular type steel deck Truck Scale system, designed to be optionally mounted on an above grade pier, floating slab or pit type foundation. Scale shall be a 3-module 4-section system that is suitable for easy movement from one location to another.

1.0 General Provisions – Truck Scale

The scale will be a fully electronic, low profile, steel deck design Truck Scale. The scale platform shall be designed and manufactured in the United States of America. The scale platform and Load Cells shall be assembled in the United States of America. The scale shall be a Rice Lake Weighing Systems Model 7511-ST-100-OTR or equivalent that will meet the following minimum standards.

1.1 The scale shall have a capacity of 135 Tons (270,000 lb) with a displayed resolution of 200,000 lb x 20 lb in accordance with NIST, Class IIIL devices.

1.2 Scale shall be a fully electronic design. The scale weighbridge will consist of factory welded modules having a total longitudinal span of 75 ft and platform width of 11 ft. No field assembly or welding will be allowed. Mechanical lever systems are not acceptable.

1.3 Each scale module shall be designed with a Concentrated Load Capacity (CLC) of 50 Tons (100,000 lb), as defined by NIST. When the CLC is applied at midspan on a module, according to NIST regulations, the maximum stress of the steel shall not exceed 26,500 PSI as determined by Finite Element Analysis (FEA) software. The deflection at this loading condition shall not cause the scale to exceed the allowable accuracy tolerance as specified by NIST in Handbook 44.

1.4 The scale provided will have an unobstructed weighing surface of 11’ (10’ 10.5”) wide by 75’ (74’ 10.5”) in length and a 18.75” minimum profile. A minimum clearance of 10” shall be provided between the concrete floor and the bottom of the weighbridge for cleanout purposes.

1.5 The scale modules will be designed as such to eliminate use of grout plates requiring setting and leveling prior to arrival of the scale at job site. A maximum of 2 drilled anchors (1” x 7”) will be provided for each Load Cell stand.

1.6 The scale system shall be a full electronic design, with internal self-checking weigh-bridge design. Weighbridges using bumper bolts, externally fixed check rods, or embedded bumper plates in the end walls will not be permitted.

1.7 Minimum weighbridge thickness will be 12 in. Scale shall be an open bottom design. Weighbridges that utilize a sealed bottom plate for structural strength shall not be permitted.

1.8 A 5/16 in diamond checkered steel treadplate shall be supported with a

minimum of (12) 12 in wide flange, 14 pounds per foot, structural longitudinal beams, welded to top flange of beam and module end plate. Only structural wide flange beam construction shall be allowed. Weighbridge designs utilizing junior beams or bent plate shall not be permitted.

1.9 The entire bridge assembly shall be cleaned prior to the addition of any coatings or paint to the weighbridge modules. Customer reserves the right to inspect the steel surfaces prior to application of any coatings to the prepared steel surfaces. All steel surfaces shall be free of all welding gases, residue, oil, mill scale and rust.

1.10 All non-visible steel shall be evenly spray coated with an asphalt emulsified coating or have equal protection applied.

1.11 All steel elements shall be steel shot blasted to SSPC-A-SP6 standards.

1.12 All visible steel surfaces will receive a 3-5 mill application of a high solids urethane primer and a high solids acrylic urethane top coat to a finish of 2-3 mill thickness.

1.13 Module end plates shall be a minimum ¾ in thick, and shall be reinforced on each side with longitudinal I-beams. Load cell pockets shall be constructed of ¾ in steel plate and shall be tied to the end plates using tabs and laser cutouts. Scale modules using flat welded or bolted end boxes shall not be allowed.

1.14 The scale will be NTEP Certified and shall meet the requirements set forth by the NIST Handbook 44 for Class III-L devices. The bidder shall submit a current copy of Certificate of Conformance (COC) with bid.

1.15 Structural steel elements will have a combined minimum weight of 35,800 pounds.

1.16 Access covers to the load cells shall be from the top of the scale and shall be boltless in design. Cover plates will be reinforced to adequately handle axle traffic over the covers and will be kept in place with ½ in diameter x 1 in long steel dowels. Cover plates utilizing bolts of any type shall not be permitted.

1.17 A ½” diameter steel rock guard shall be welded to the end modules.

1.18 The truck scale shall be provided with a fabricated end cleanout area measuring 12” x 84” with removable end plates at each end of the scale system. (May be quoted as a option)

1.19 Manhole frame and cover (24 in square) shall be provided for access to the pit area beneath the scale. (Optional for pit installations)

1.20 Scale shall be equipped with optional replaceable 8” high gusseted bolt-on safety guiderails full length both sides of the scale, painted OSHA Safety Yellow, with a minimum of 4” diameter pipe. A minimum of 3 each ¾” bolts will be used at each gusset to attach side rail. Guiderails welded to the

weighbridge or mounted to the foundation shall not be permitted.

1.21 The scale provided shall be a Rice Lake Weighing Systems SURVIVOR® Series Model 7511-ST-100-OTR or equivalent.

2.0 Load Cells and Junction Boxes

Load cells are rigidly mounted utilizing a single link suspension to provide equal and consistent and evenly distributed force to the load cell. Load cells are totally self-contained, and come complete with mounting stands, single-link suspension, and 60 ft of cable to junction box. Compression or rocker style load cells shall not be permitted.

2.1 Load Cells shall be rigidly mounted in fabricated steel stands parallel to traffic flow. Suspension system will be E4340 material forged single link suspension hardened to Rockwell “C” 40-45 to allow self-centering and free floating platform. Rocker column or compression type load cells requiring check rods, anti-rotation pins or bumper bolts will not be permitted.

2.2 Load cells will be of the analog type and have a minimum capacity of 75,000-lb each with an overload safety factor of 150 percent. Scales utilizing a lower capacity load cell than 75,000 lb will not be permitted.

2.3 Scales utilizing adjustable bumper bolts or embedded plates in the wall to minimize movement of the bridge shall not be allowed.

2.4 Systems utilizing proprietary, internal circuitry to convert analog to digital conversion of the load cell signal within the load cell shall not be permitted.

2.5 All access to load cells will be from the top of the scale through formed boltless steel access panels. Covers should be form fitted and should be accessible without use of tools.

2.6 Steel conduit will be provided within the weighbridge for load cell cable runs.

2.7 A flexible screw-type conduit fitting shall be provided at each load cell. Load cell cable shall be totally enclosed within permanent conduit provided within the weighbridge. Load cells using connectors of any type will not be permitted. Braided metal cable covering shall not be used in place of steel flex conduit or hardened steel conduit.

2.8 Load cells shall be of 4340 alloy steel nickel plated and shall be sealed with a minimum IP67 rating.

2.9 Load cells shall be non-proprietary in design, including both mechanical operation and electronic transmission of signal. Manufacturers using proprietary load cell technology available from a single source will not be permitted.

2.10 Replacement load cells shall be available from a multitude of vendors nationally, and shall not be single sourced or of a proprietary design.

2.11 Fiberglass Reinforced Polyester (FRP) junction box with formed contoured edges and gasketed top access. Junction box shall have a GORE-TEX® single directional membrane vent. Steel junction boxes shall not be permitted as internal condensation will form causing circuitry damage..

2.12 Load cell stands will be flush mounted to concrete piers and anchored using wedge locks or similar bolts. A maximum of (2) ¾ in x 7 in anchor bolts will be required per stand and will be included in the cost of the scale. Grout plates or embedded items in the foundation concrete will not be allowed.

2.13 A 1" braided copper transient bypass cable shall be provided at each load cell from the weighbridge to the base stand.

2.14 A UPS Duplex Voltage regulating transformer with Surge Voltage protection shall be standard.

2.15 A replaceable UJB-3T6 DC Transient circuitry protection for Load Cells shall be standard.

2.16 Load cells shall be warranted for a minimum of five years against failure of all types, including lightning or surge voltage.

2.17 A single-point grounding system shall be provided. Systems utilizing a multiple point ground will not be permitted.

3.0 Digital Instrumentation Specifications

The supplied scale shall be compatible with existing Programmable Indicator/Controller complete with operator friendly diagnostics for the load cells and Junction Box which is integrated to an existing Landfill software system.

3.1 Scale shall be supplied with a new 100' OTR to Weight Indicator interface cable.

3.2 Scale shall be supplied with a new 100' #10 gauge single point grounding wire.