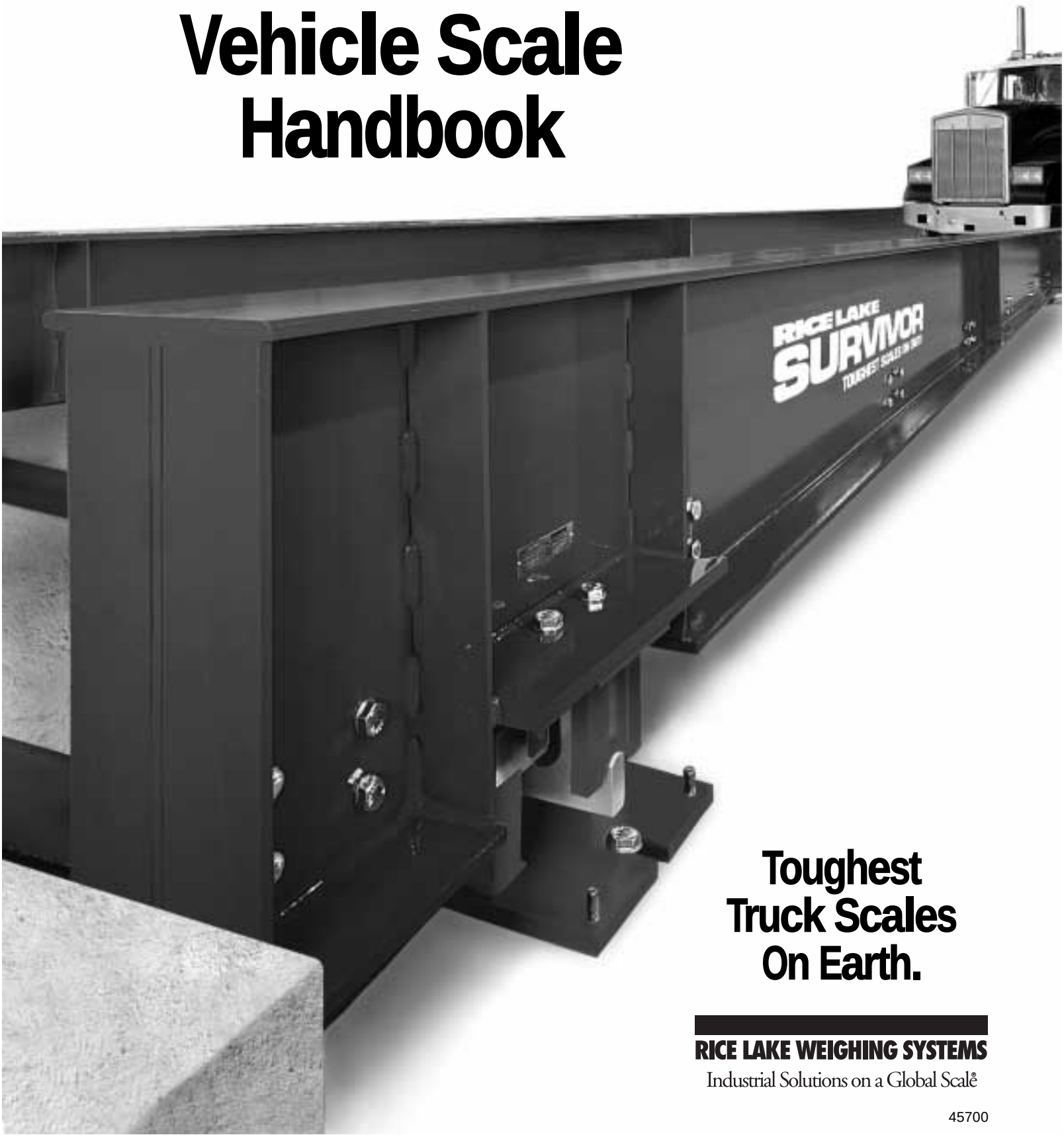
SURVIVOR®

SR & EZ SERIES
TRUCK SCALES

Vehicle Scale Handbook



Toughest Truck Scales On Earth.

RICE LAKE WEIGHING SYSTEMS
Industrial Solutions on a Global Scale®

45700

How to use this Vehicle Scale Handbook

This handbook is an aid to help you in making a truck scale presentation on the SURVIVOR series vehicle scales.

This booklet is divided into sections devoted to specific truck scale concerns and needs.

Introduction:	Planning a truck scale installation US State and Canadian Province truck size and weight regulations
Scale information:	Weighbridge structure Wiring, Electronics, and Lightning Protection
Site information:	Foundation requirements State Weights and Measures agencies
Installation information:	Recommended equipment (SR series) Recommended equipment (EZ series)\
Engineering details:	Specifications sheets (SR and EZ series) Engineering reference quote sheet (SR and EZ series) Quotation Form
Warranty:	Vehicle scale warranty
Shipping and Scheduling:	Shipping Guidelines for SR series Shipping Guidelines for EZ series
Simplified Buyers Guide:	Questionnaire pullout section for the truck scale buyer
Drawing Package	70’x14’ 100-ton SR Concrete Deck Scale and foundation options

By reviewing this booklet, you will be better equipped to make an informed decision on what is a very expensive and long-term investment.

Should you have any questions concerning this booklet or other scale-related issues, please call Rice Lake Weighing Systems at (800) 472-6703.

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Continued

Planning a Truck Scale Installation

A vehicle scale is a major investment and probably represents one of the most expensive weighing systems you will ever buy. With that expense in mind, the decision must be founded in long-range planning that takes into account all present and likely future uses of the scale system. Ideally, a qualified project engineer familiar with your industry should analyze your company's needs and write specifications for a comprehensive solution to meet those needs. Alternately, you can do your own analysis, then write your own specifications before purchasing a vehicle scale. Whichever method you choose to transfer your needs to a written specification, the variety of information needed may surprise you.

The comprehensive information you need to compile a "system" specification must normally be sought from several sources. The purpose of this handbook is to provide you with some of the hard-to-find information required, and to help you discover the right questions to ask. Only by asking the hard questions will you eventually find the best solutions for all aspects of your total vehicle weighing system.

The following questions will help you discover and organize the information needed to make informed, long-range decisions and find the best solutions for the complete vehicle-weighing system.

Capacities

1. What type of trucks will be weighed? Single-axle? Dual-axle? Tri-axle?
   What are the maximum axle loads of each type expected?

2. How long should the weighing platform be for current and future needs?
   What is the maximum legal truck/trailer combination length in your state?

3. How many weighments are expected per day?

4. Are axle weights necessary, or only gross vehicle weights?

5. What is the maximum total weight expected to be weighed on the scale?
   What is the minimum total weight expected to be weighed on the scale?

Site Location

6. What approach length is required by NTEP? Is there sufficient room?

7. Will existing traffic patterns at the site interfere with the vehicle scale?

8. Will high groundwater or even occasional flooding create a possible problem?

9. Is there abnormal RFI/EMI noise at the site?

10. Is the site located within a hazardous environment?

11. Will you possibly want to relocate the scale in future years?

12. Are soil-bearing characteristics acceptable without major excavation and fill?

13. Will underground utilities need to be rerouted from the site?

14. Is there construction and maintenance access to both or only one side of the scale?

Life Cycle and Warranty Considerations

15. The heart of a vehicle scale is the weighbridge. How long is the weighbridge warranty?

16. How much does the deck bend under a maximum legal highway load on tandem-axle spacing?

17. What is the "r" factor of the weighbridge compared to Federal Bridge Standards?

Load Cells and Suspension

18. Are load cells NTEP-approved for legal-for-trade applications?

19. Are load cells sized at 75,000 lbs to protect against accidental overload?

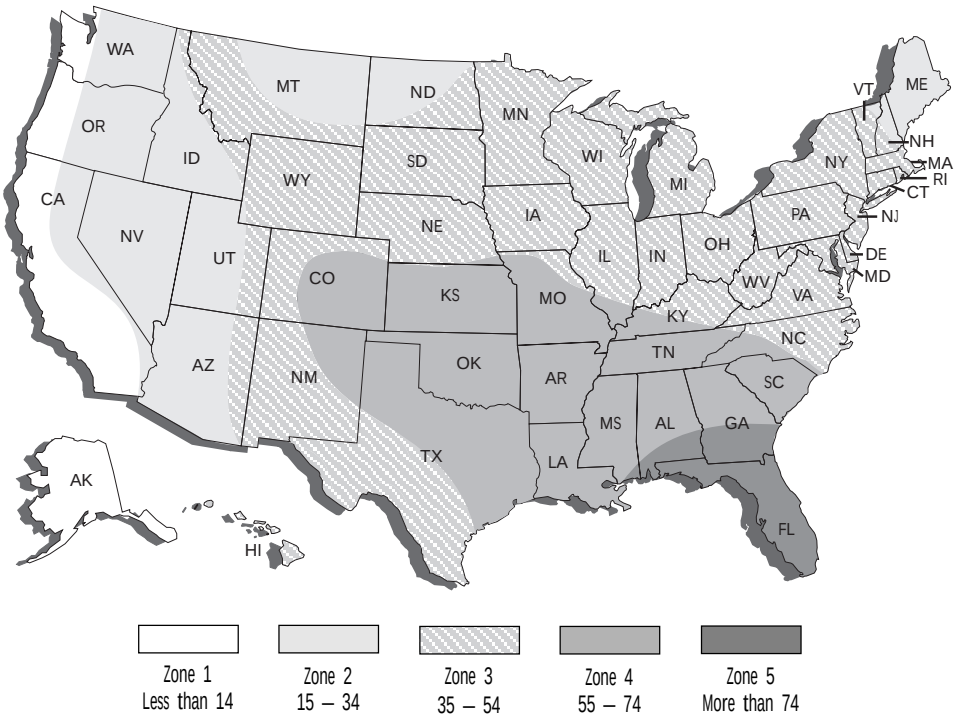
20. Are stainless steel, hermetically-sealed load cells needed for chemical or water contact?

21. Are load cell mount suspension systems self-checking and self-centering?

22. How long is the standard load cell warranty?

23. Is extended warranty lightning insurance available and needed for load cells?
    The following map of thunderstorm frequency may be helpful in answering this question.

Average Days of Thunderstorm Activity in US



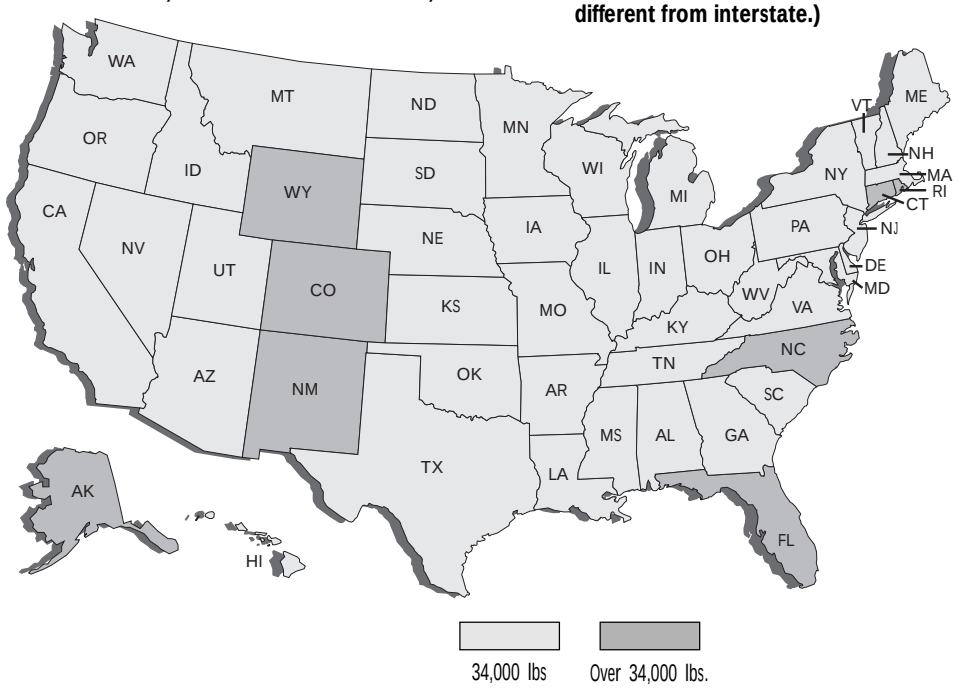
The following maps will aid you in determining State and Provincial vehicle standards. The information on the maps was current as of 1997.

State and Provincial Truck Size and Weight Regulations

Tandem Axle Maximum Weights by State

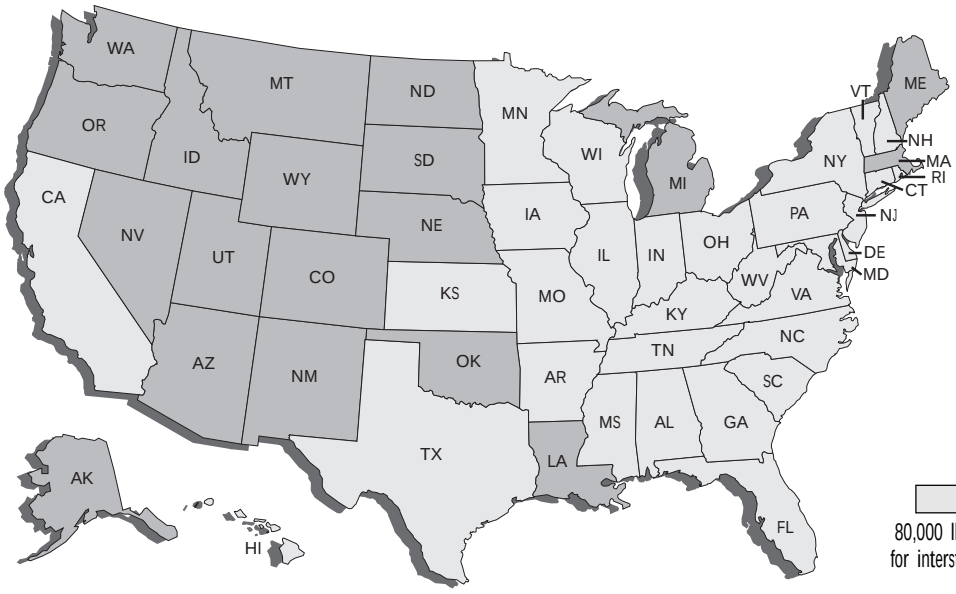
**** — Limited to 34,000 lbs. if GCW exceeds 73,280 lbs.**

(Figures in parentheses represent non-interstate highway limits where different from interstate.)



AK 38,000
CO 36,000 (40,000)
CT 36,000
DE (40,000)
DC 38,000
FL 44,000
GA **
ID (37,800)
NH ** Formula B if GCW over 73,280 lbs.
NM 34,320
NY (36,000) Formula B if GCW over 71,000 lbs.
NC 38,000
PA **
RI 36,000
SC 35,200 if GCW under 75,185 (39,600)
WY 36,000

Maximum Weights Highway Combinations by State



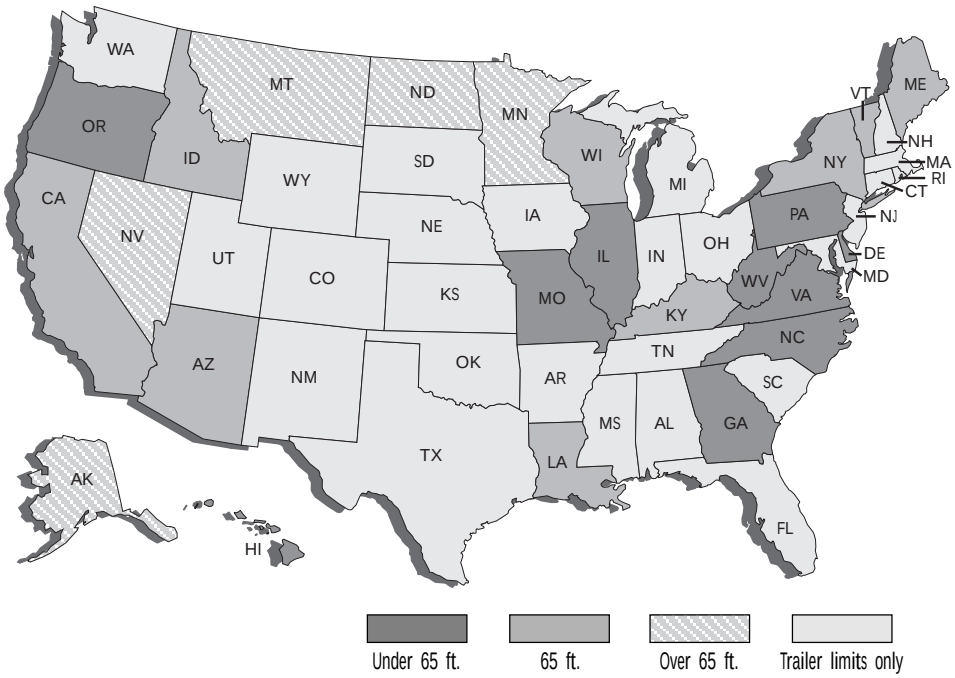
P — Permit required
D — Designated highways
LCVs — Longer combination vehicles
S — State authorized routes
T — Combinations with tridem
(Figures in parenthesis represent non-interstate highway limits where they differ from interstate limits.)

AK Formula B
AL (84,000) **T**
AZ **LCVs** - 129,000 **PD** Formula B
CO **LCVs** - 110,000 **PD** Formula B; (85,000)
HI (88,000)
ID **LCVs** - 105,500 **P** Formula B
IL (73,280)
KS (85,500)
LA 83,400 **T**; (88,000 **T**)
ME 100,000 **T**; (100,000 **T**)
MA **LCVs** - 127,400 **PD** Formula B
MI 164,000 requires 11 axles; 80,000 on five axles
MN (73,800) **D**
MO (73,280)
MT **LCVs** - Formula B, **P**
NE **LCVs** - 95,000 **P** Formula B
NV **LCVs** - 129,000 P
NH (99,000 **T**)
NM 86,400
ND **LCVs** - 105,500 **P** Formula B
OK **LCVs** - 90,000 **P**
OR **LCVs** - 105,500 **PD** Formula B
SC (80,600)
SD **LCVs** - 129,000 **P** Formula B
UT **LCVs** - 129,000 **P** Formula B
WA **LCVs** - 105,500 **P** Table B
WY 117,000 Formula B

Tractor & Semi-Trailer Maximum Combination Lengths by State

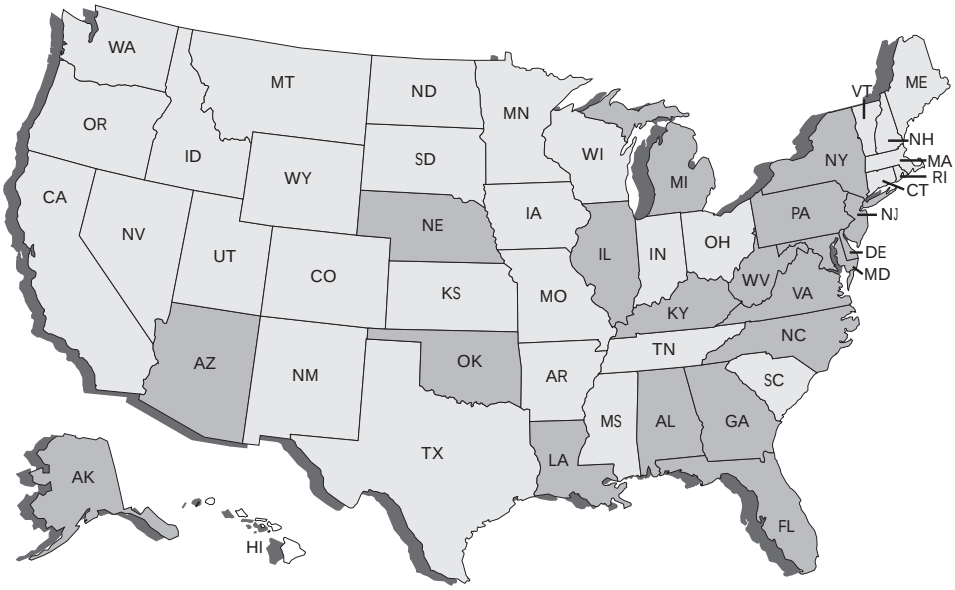
S — State authorized routes
KP — Kingpin to center rear axle controls

(Off the National Network)
P — Permit required



AK 70 ft.
AZ 65 ft. if semi trailer exceeds 53 ft.
CA 65 ft.; 40 ft. **KP**; 38 ft. **KP** single rear axle
CO 70 ft. if semi trailer exceeds 57 ft., 4 in.
DE 60 ft.
DC 55 ft.
GA 60 ft.; 67-1/2 ft. **S** 41 ft. **KP**
HI 60 ft.
IL 55 ft.
IN 40-1/2 ft. **KP** if trailer exceeds 48-1/2 ft.
MN 75 ft.
MO 60 ft.
MT 75 ft.
NV 70 ft.
NM 65 ft. if semi trailer exceeds 57-1/2 ft.
NC 60 ft.
ND 75 ft.; 88 ft. **S**
OR 60 ft.; 65 ft. **S**
PA 60 ft.
VA 60 ft.
WY 60 ft.; 55 ft. **S**

Maximum Width by State

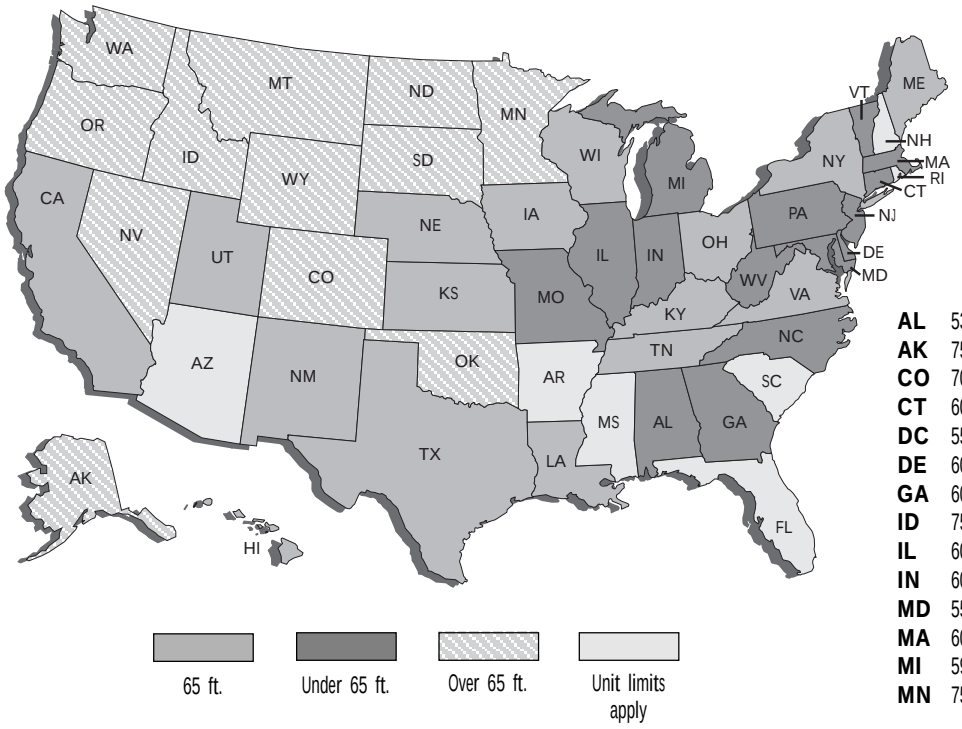


HI 108 inches

Data subject to change; please consult individual state Department of Transportation agency for latest data.

Truck & Full Trailer Maximum Combination Lengths by State

D — Designated highways include legal tolerances

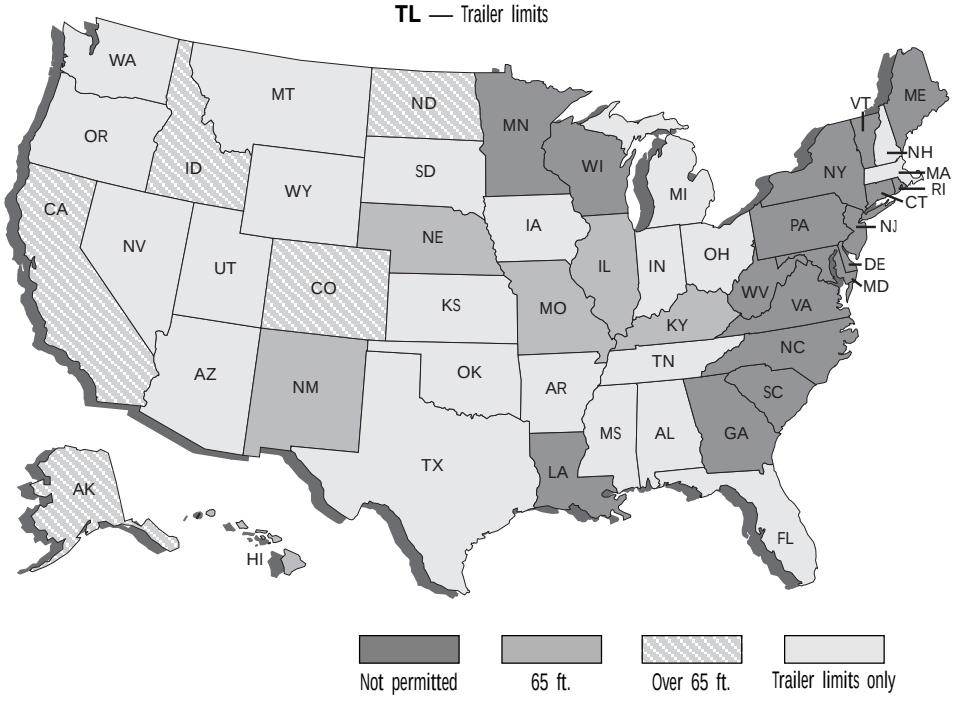


AL 53-1/2 ft.
AK 75 ft.
CO 70 ft.
CT 60 ft.
DC 55 ft.
DE 60 ft.
GA 60 ft.
ID 75 ft.
IL 60 ft.
IN 60 ft.
MD 55 ft.; 60 ft. **D**
MA 60 ft.
MI 59 ft.; 65 ft. **D**
MN 75 ft.
MO 55 ft.; 65 ft. **D**
MT 75 ft.
NV 70 ft.
NJ 62 ft.
NC 60 ft.
ND 75 ft.; 88 ft. **D**
OK 70 ft.
OR 75 ft.
PA 60 ft.
SD 80 ft.
VT 60 ft.
WA 75 ft.
WV 60 ft.
WY 60 ft.

Multiple Trailer Units Maximum Combination Lengths by State

ID — Interstate and designated highways (national system)
S — State authorized routes

(Off the National Network)
P — Permits required
T — Toll road/turnpike
TL — Trailer limits



AK 75 ft.; 95 ft. **P**
AZ **TL**; 105 ft. permits required on 1-15
CA 75 ft.
CO **TL**; 70 ft. overall if trailer limits exceeded
ID 105 ft. **P**; **TL** 75 ft. overall if trailer/connector/trailer exceeds 61 ft.
IN **TL; T**
MA Twin 48 ft. trailers **T**
MI 58 ft. **S** if trailer limit exceeded
MO 65 ft. **S**
NV **TL**; 105 ft. **P**; if trailer limits exceeded, overall length is 70 ft.
NY 114 ft. **T**
ND 75 ft.; **ID** 110 ft; 88 ft. **S**
OH **TL**; 90 ft. **T**
OK **TL**; (three at 20 ft. each **P**)
OR 60 ft. **TL**; 68 ft. **ID**
PA 85 ft. **T**
SD **TL**; 81-1/2 ft. (sum of trailers plus towbar)
WA **TL**; 61 ft.; 68 ft. **P**
WY 81 ft. **TL**

Data subject to change; please consult individual state Department of Transportation agency for latest data.

Canadian Provinces Vehicle Sizes & Weights

In 1988, all Canadian provinces signed a Memorandum of Understanding (MOU) establishing uniform size and weight limits for common vehicle configurations. A vehicle obeying the size and weight specifications of the MOU is legal across all Canadian provinces. However, individual Canadian provinces retain the right to establish limits that are more liberal than the specifications of the MOU. Following are the limits established for the MOU.

Length Limits (All measurements in meters)

Overall Height 4.15
Overall Width 2.6
Overall Length
- Straight Truck 12.5
- Truck & Full Trailer 23
- Truck & Pony Trailer 23
- Tractor Semi-Trailer 23
- A Train Double 25
- B Train Double 25
- C Train Double 25

Trailer Length
- Full Trailer 12.5
- Semi-Trailer 16.2

Box Length
- Truck & Full or Pony Trailer 18.5
- A Train Double 18.5
- B Train Double 20
- C Train Double 20

Wheelbase
- Truck ..... Not restricted
- Tractor (min) 3
- Tractor (max) 6.2
- Full Trailer (min) 6.5
- Semi-Trailer (max) 12.5
- Semi-Trailer (min) 6.5

Weight Limits (All measurements in kilograms)

Gross vehicle weight
- Truck – 3 axles 22,500
- Truck-tandem/tandem ..... Not Permitted
- Truck & Pony – 6 axles 43,500
- Truck & Full – 5 axles 39,500
- Truck & Full – 7 axles 53,500
- Tractor Semi-Trailer – 3 axles 23,700
- Tractor Semi-Trailer – 4 axles 31,600
- Tractor Semi-Trailer – 5 axles 39,500
- Tractor Semi-Trailer – 6 axles 46,500
- A Train – 5 axles 39,700
- A Train – 6 axles 47,600
- A Train – 7 axles 53,500
- A Train – 8 axles 53,500
- Second Trailer Weight (max) 16,000
- B Train – 5 axles 40,700
- B Train – 6 axles 48,600
- B Train – 7 axles 56,500
- B Train – 8 axles 62,500
- C Train – 5 axles 41,900
- C Train – 6 axles 49,800
- C Train – 7 axles 54,600
- C Train – 8 axles 58,500
- Second Trailer Weight (max) 21,000

Axle loads
- Steering Axles 5,500
- Single Axle – dual tires 9,100
- Tandem 1.2m spread 17,000
- Tandem 1.8m spread 17,000
- Tridem 2.4m spread 21,000
- Tridem 3.0m spread 23,000
- Tridem 3.7m spread 24,000
- Triaxle 1.5m + 2.5m ..... Not permitted
- Triaxle 1.8m + 3.0m ..... Not permitted

Scale Information

Weighbridge Structure

Comparing truck scale application capacities can be confusing. Different manufacturers highlight different values in their sales, engineering, and service documents, which can be perceived as the same thing - even when they are not. For example, the Concentrated Load Capacity (CLC) and "r" factor ratings (from Federal Bridge Standards) are often perceived as a method of determining the strength of a weighbridge. This is a common misunderstanding that leads to confusion about judging weighbridge strength.

Concentrated Load Capacity (CLC)

The CLC rating resulting from an NTEP test is only a measurement of how well the load cells (and load cell suspensions) react to large loads placed on the scale deck in a 4' x 10' area. The 4' x 10' loading area is generally in the middle of an unsupported span to simulate an actual live load bearing on tandem truck axles. When a CLC load is applied to the weighbridge during an NTEP test, the NTEP tester records the displayed weight. If the scale falls within acceptance testing tolerances, the scale has that CLC weight value recorded as the CLC on the Certificate of Conformance.

The CLC rating is not a measure of weighbridge strength or rigidity, because weighbridge deflection is not measured in the NTEP test. It is irrelevant if the loaded weighbridge sags 1/10th of an inch, or 10 inches, as long as the scale weighs within the acceptance tolerance. The scale's CLC weight rating passes in either case. A high CLC rating could be given to an extremely flexible deck sitting on load cell mounts which were capable of accurately handling the side loading resulting from a severely sagging weighbridge.

Federal Bridge Standards "r" factor

The "r" factor is a better method of determining a weighbridge's carrying capacity. Again there are variables that will modify the rating of the scale, such as the number of axles and axle spacing. The "r' factor is a method of determining acceptability of a roadway bridge to carry expected loads. Since a truck scale is similar to the unsupported span of a bridge structure, this type of rating has validity as an indication of weighbridge strength in a vehicle scale.

Table B of the Federal Bridge Gross Weight Formula in NIST Handbook 44 is referenced in determining "r" factors. This table assigns the maximum legal highway load (34,000 lbs) bearing on a dual tandem axle (axles 4' apart) as a reference value of 1. This value of 1 for a bridge span assumes a large safety factor is built into the bridge as a safeguard against catastrophic failure. Bridges designed for loads other than 34,000 lbs on 4' axle spacing are assigned an "r" factor by simple division. A bridge designed for a 17,000 lbs load on 4' axle spacing would be assigned a 0.5 "r" rating, and one designed for 68,000 lbs on that same spacing would be assigned a 2.0 rating.

Some scale manufacturers have advocated adopting this concept for rating the unsupported spans of vehicle scales. If a truck scale manufacturer designs a scale for a 60,000 lb load on 4' tandem axle spacing, the "r" factor for that scale would then be 1.76.

The SURVIVOR® SR series scale decks, designed for a 90,000 lb load on a 4' tandem axle spacing, rate a 2.65 "r" factor, one of the highest in the truck scale industry.

It is important to remember that the manufacturers set the amount of weights used in NTEP testing for their scales, and the total is directly related to the CLC assigned to the scale. Because the CLC does not measure weighbridge deflection, neither then does the "r" factor calculated from the CLC. While a large "r" factor may indicate the ability of a structure to handle a certain load without catastrophic failure, it does not address the effects of repeated flexing on ultimate weighbridge life. While a significant deck deflection might not collapse a scale, it will certainly shorten the useful life cycle of a weighbridge if repeated frequently enough.

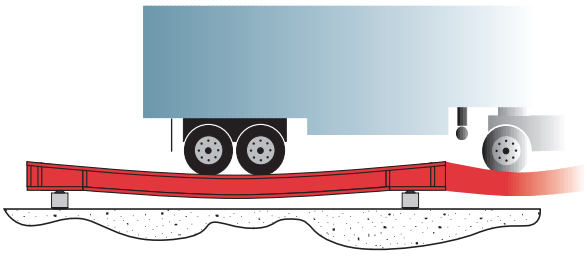
Besides not addressing deck deflection, the “r” factor is of limited use for certain applications with vehicles not designed for travel on highways. Most problems of truck scale suitability are for trucks that do not typically travel on highways. For example, the Rice Lake Weighing Systems SURVIVOR series trucks scales (and their foundations) have been designed for a 90,000 lb 4' tandem axle load, hence their “r” factor is 2.65. The trucks that are most often the biggest problem for vehicle scales are mining trucks not limited by legal highway load limits. These vehicles may have a single large axle that usually exceeds 34,000 lbs on that single axle, and may exceed 90,000 lbs. Bridge formula table “B” does not address this type of single-axle loading configuration.

Span Deflection Ratio

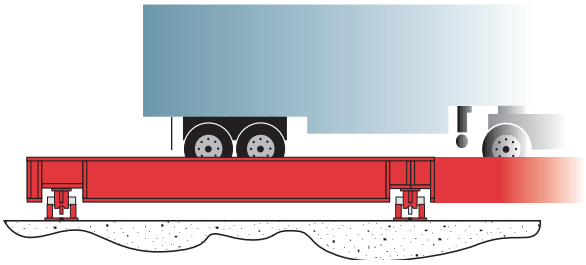
The best method of determining weighbridge strength is the one chosen by the railroads many years ago. This is the standard span deflection ratio for railroad scale decks at a specific load. As an example, a railroad weighbridge should not deflect more than 1/1200 of the span distance. A 20' span (240") should not deflect more than 0.2" (1/1200 x 240") when loaded to the maximum load that the scale will see (for railroad track scales, E-80 equals 80,000 lb loads every 5 feet along the scale).

Deflection in this case is defined as a ratio of span to the overall deflection of the weighbridge when loaded in the worst-case position on the weighbridge with the highest designed load (CLC or dual axle loads).

The SURVIVOR siderail truck scale (SR-series) deflects no more than 1/900 at its rated load of 90,000 lbs on 4' axle spacing (CLC rating and dual axle load rating are considered the same for this calculation). This means that the scale weighbridge will not deflect more than 0.27" over a 20-foot span. The less deflection, the less bending stress in the weighbridge and the longer the life cycle. The figure below is exaggerated to illustrate span deflection action.



Typical truck scales deflect 1:500 – 1:600



SURVIVOR SR truck scales deflect only 1:900

This final piece of the puzzle, long term life cycles, is critical when looking at a truck scale purchase.

Summary

We have three methods of reviewing a truck scale:

- CLC to determine weighing accuracy,
- “r” factor for the methods of loading, and
- span deflection ratio for comparing deflection and the life cycle of competitive truck scales.

Each is important, each is a valuable measuring method, and each provides a unique perspective to the end user making a decision to purchase a vehicle scale.

Truck Scale Grounding and Lightning Protection

As a general rule, always strive for a *single-point* grounding system. Do not drive ground rods at the scale location and establish a separate earth ground for the scale. This separate earth ground may not share the same zero reference as the existing earth ground for the AC power system. This difference in electrical potential invites ground-loop current flow between the two grounds, often corrupting data communication like RS-232 which depends on a stable zero reference.

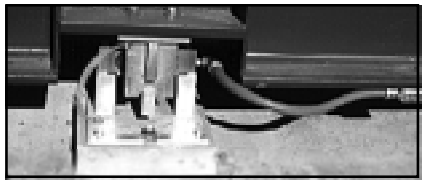
In addition, a separate earth ground system at the scale can actually invite lightning damage!

- A minor powerline surge in the scale house electrical supply should immediately be shunted to ground. If a separate ground system exists at the scale with a lower potential than the main ground, the surge may travel out to the scale ground, possibly damaging load cells en route.

- A nearby lightning ground strike may instantly raise the zero potential of a ground rod at the scale location, while leaving the scale house ground rod affected less. That lightning surge will now take the easiest path to the lower-potential ground—through the scale wiring and back to the scale house ground, possibly damaging the indicator en route.

Therefore, we believe the best grounding system for the scale is the same grounding system used for the incoming AC power system. The 120 VAC power source used to power the indicator will be connected to an existing earth-grounded rod at the service panel of the scale house or other building where the indicator is located. This earth ground must consist of a double ground rod system of two 5/8" x 8' copper rods driven 8' deep at the service entrance where the local utility company brings their lines into the building. The local utility company can test the resistance of the existing ground rods with a clamp-on ground tester that measures zero resistance. If that test determines that the grounding system is inadequate, the utility company can suggest methods to improve the system. It's crucial that the scale owner authorize and make the recommended improvements to assure an adequate electrical ground.

An integral part of the load cell lightning protection system is a grounding strap securely connected to the top plate and bottom plate of each load cell mount. This strap is designed to channel power surges on the deck around—rather than through—the load cell to ground.



A separate grounding system conductor must extend uninterrupted from the main service panel to the scale to protect load cells and scale wiring from lightning and other transient damage. This ground wire conductor must be #10 bare copper wire or larger. Run the ground wire conductor unsheathed and intact from the scale house power earth ground connection *underground* in a shallow trench to the transient protection device and the grounding lug within the junction box.

All ground wire connections must be torqued tightly and retightened at regular service intervals. A thick coating of anti-oxidant grease should be maintained on all ground wire conections for further insurance. Even the most carefully designed lightning protection system is useless if connections become loose. Corroded or loose ground wire connections could cause thousands of dollars of load cell damage from a nearby lightning strike in a thunderstorm.

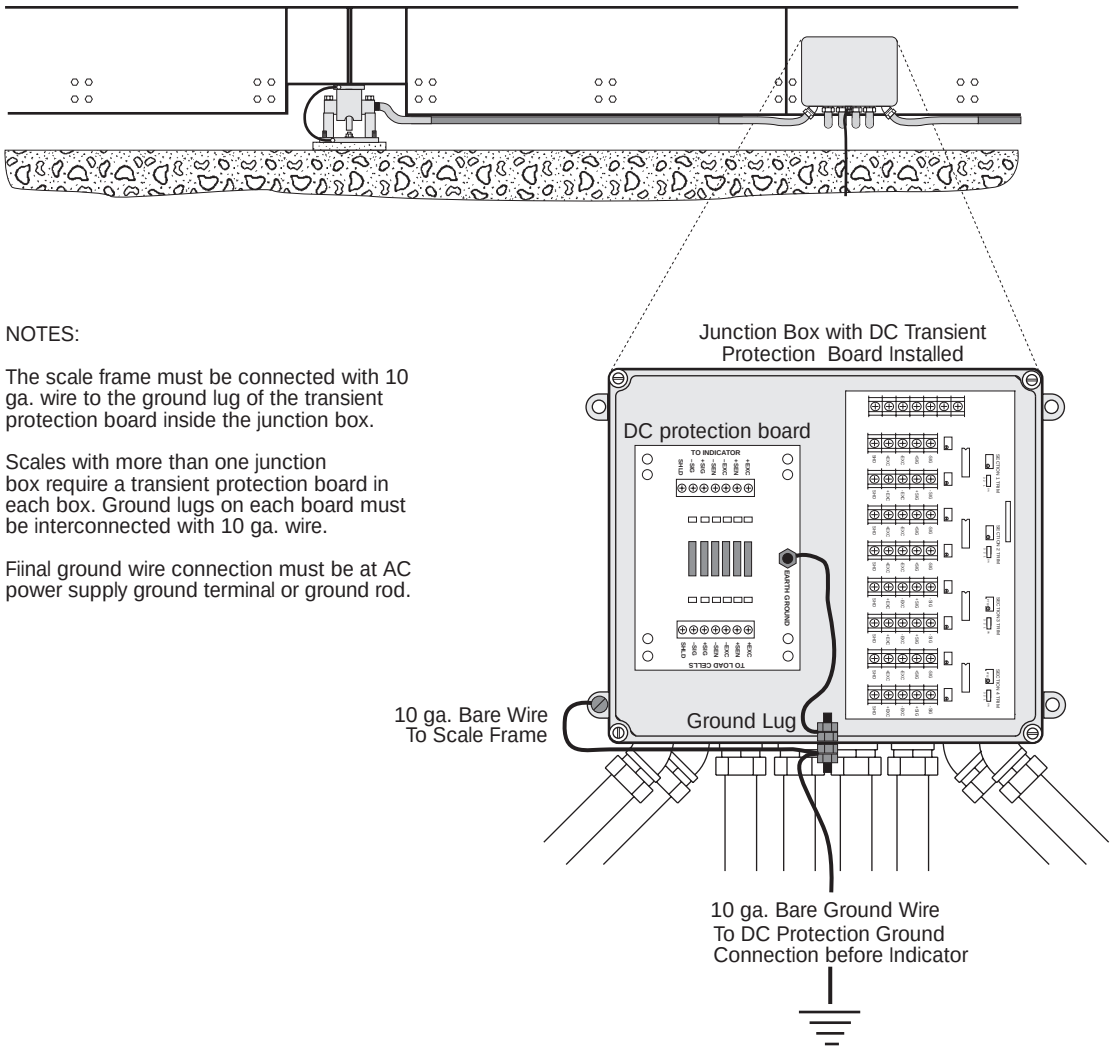
Lightning and Transient Protection Options

A lightning protection package is available as an option for all SR and EZ scales. The individual components of this comprehensive package are designed to protect AC and DC portions of the system, as well as any serial communication lines. The optional lightning protection package consists of the following:

- DC transient protection board(s) mounted within the junction box. This DC transient protector handles up to eight load cells and also protects serial communication lines. Scales with more than eight load cells will require a DC transient protection board in each junction box.
- Self-contained DC transient protection unit in homerun cable at indicator.
- Single-point #10 bare ground conductor cable buried in earth from scale frame to DC transient board in junction box to DC transient board at indicator, then to AC power ground lug.
- 120 VAC uninterruptible power supply/surge protector in AC line before indicator.

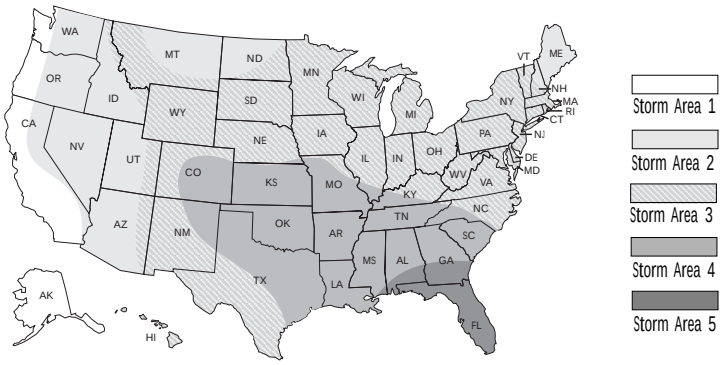
All elements of the optional package must be installed in order to apply for the Lightning Protection Extended Warranty Coverage detailed on the following page.

Grounding and Transient Protection on Typical SR Scale



Lightning Protection Extended Warranty Coverage

Extended warranty for lightning protection covers materials only. Determine the amount of coverage and cost of lightning protection packages (available only at time of vehicle scale order) by following the steps outlined below.



1. Select the order number of Lightning Protection Package (LPP1 or LPP2) you need with the vehicle scale you are purchasing (ex: an 8-load cell unit is LPP1 for $1,465.00).
2. Determine the zone you are located in (see above map).
3. Find the number of years of extended coverage you desire. The first year of coverage is included in LPP1 or LPP2 Lightning Protection Package and is the same price no matter what zone you are in.
4. Select the part number for the coverage time desired from your zone category.
5. To qualify for the extended warranty coverage you must purchase the Lightning Protection Package (LPP1 or LPP2).
6. In addition to the purchase of the Lightning Protection Package (LPP1 or LPP2) there also must be a biannual contract inspection of the site and inspection of the transient protection electronics for acceptance of coverage by Rice Lake Weighing Systems. The inspection must be completed by a qualified RLWS distributor.

PART #	DESCRIPTION	LIST PRICE
Lightning Protection Packages (LPP1 and LPP2)		
45610	First year, 4 to 8 load cell system (LPP1)	$1,465.00
45609	First year, 10 to 12 load cell system (LPP2)	$2,035.00
Storm Area 1 Lightning Zone		
45628	Year 2	add $500.00
45629	Year 2 and 3	add $1,000.00
45630	Year 2, 3 and 4	add $1,500.00
45631	Year 2, 3, 4 and 5	add $2,000.00
Storm Area 2 Lightning Zone		
45632	Year 2	add $550.00
45633	Year 2 and 3	add $1,100.00
45634	Year 2, 3 and 4	add $1,650.00
45635	Year 2, 3, 4 and 5	add $2,200.00
Storm Area 3 Lightning Zone		
45636	Year 2	add $600.00
45637	Year 2 and 3	add $1,200.00
45638	Year 2, 3 and 4	add $1,800.00
45639	Year 2, 3, 4 and 5	add $2,400.00
Storm Area 4 Lightning Zone		
45640	Year 2	add $650.00
45641	Year 2 and 3	add $1,300.00
45642	Year 2, 3 and 4	add $1,950.00
45643	Year 2, 3, 4 and 5	add $2,600.00
Storm Area 5 Lightning Zone		
45644	Year 2	add $750.00
45645	Year 2 and 3	add $1,500.00
45646	Year 2, 3 and 4	add $2,250.00
45647	Year 2, 3, 4 and 5	+3,000.00

DEALER INSPECTION DOCUMENT

Effective Date: 5-1-98

The following documentation should be filled out and kept on file for warranty claim purposes on the EXTENDED LIGHTNING PROTECTION WARRANTY CLAIM. Please have two signatures: the site end-user supervisor or acceptable end-user alternate employee, and the service technician that performed the inspection.

KEEP THIS DOCUMENT ON FILE IN CUSTOMER FILE FOR FUTURE FACTORY REFERENCE.

RICE LAKE VEHICLE SCALE MODEL NUMBER: _____
Serial number of scale: _____
Serial number of PCB inspected: _____
Indicator serial number: _____
Printer Serial number: _____
DATE OF INSPECTION: _____

REVIEW THE FOLLOWING ITEMS in your INSPECTION

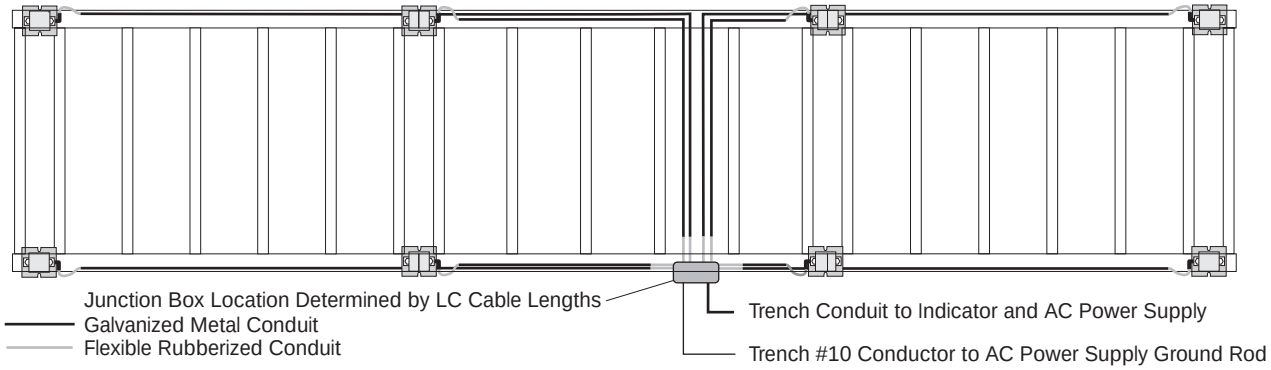
Are J-box transient protection board components discolored, deformed, or burned out?	YES / NO
Is the grounding cable connected to the ground rod?	YES / NO
Is the grounding cable connection corroded?	YES / NO
Is the A/C protection connected?	YES / NO
Is the A/C protection grounded?	YES / NO

Signature of Distributor Technician: _____ Date: _____

Signature of End-User Site Supervisor: _____ Date: _____

Electrical Conduit Requirements for Scale Wiring

Typical Example of Conduit Runs on 70' x 14' Scale



Load Cells to Junction Box

Each load cell is equipped with 60' of load cell cable. This length is sufficient to reach a centrally-located junction box on all standard scales. A watertight LB right-angle connector and 30" of 3/4" flexible conduit is supplied for each load cell. At the junction box, watertight conduit connectors and 30" flexible conduit sections are provided for each of the conduits runs. Main conduit runs between these 30" flexible sections are to be 3/4" galvanized metal conduit obtained locally.

Junction Box to Indicator

6-wire homerun cable is run in 3/4" galvanized metal conduit from the junction box to the indicator. 60' of homerun cable is supplied. A 30" flexible conduit section and watertight conduit connector is provided where this cable exits the junction box. Galvanized metal conduit is to be obtained locally.

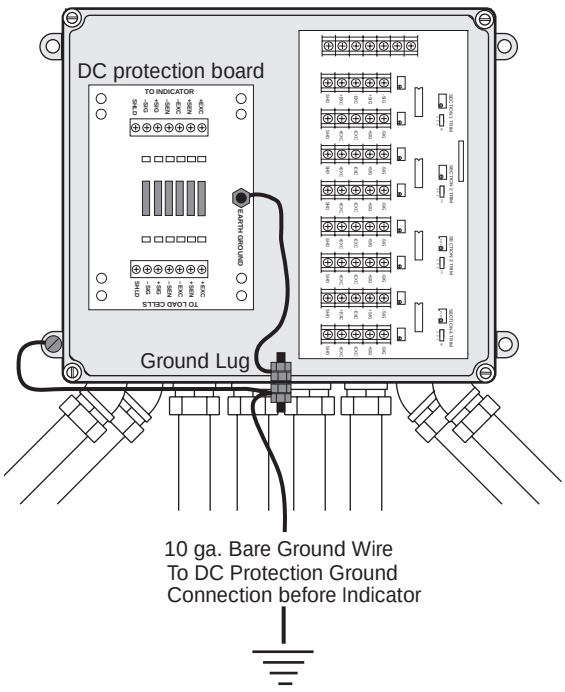
Indicator to Peripherals

All conduit for cabling to peripheral devices is the responsibility of the installer to obtain locally.

Single-Point Ground Conductor

As noted in the previous section, a bare 10 gauge solid wire is to be run underground from the grounding lug on the junction box to the main AC power earth ground. If the optional DC transient protection board is installed as shown at right, the ground conductor should also be attached to the transient protection board's ground lug.

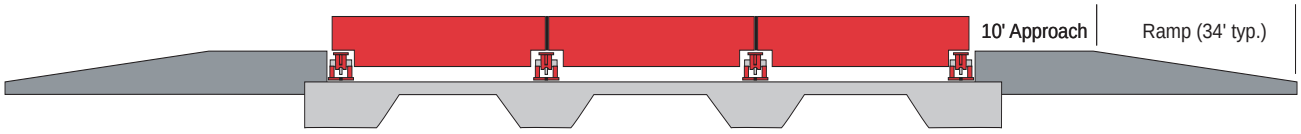
This bare ground cable is *not* to be run in conduit, but should be buried to provide direct earth contact.



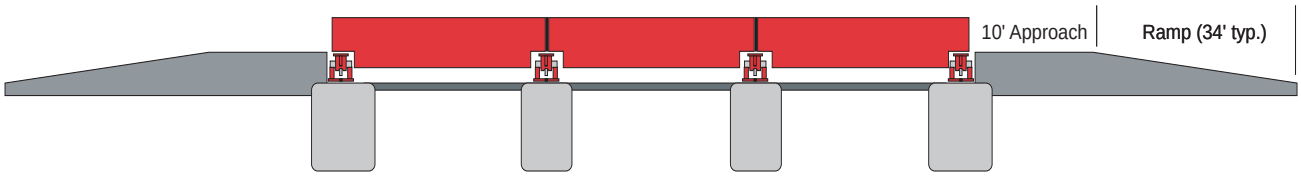
Cable Placement in Trenches

As a general guideline, run AC and DC cables in separate trenches if possible. When DC load cell cables must run in the same trench as AC power lines, separate cables as much as possible to avoid interference. See the scale installation manual for additional details.

Site Information and Foundation Specifications



Reinforced Slab Foundation



Pier Foundation

Overview

The reinforced concrete slab foundation or reinforced concrete pier foundation must be constructed in accordance with supplied drawings and specifications. Both foundation systems are dimensionally identical at contact points with the scale. Either the slab or pier foundation may be used with the SR or EZ series scales, depending on local climate and soil conditions.

Per NTEP specifications, level concrete approaches at least 10' in length are required at entrance and exit to the scale. Necessary ramps from approaches to existing grade may be concrete, asphalt, gravel or other suitable surface. Contact your State Weights and Measures Department for site-specific requirements.

Soil Bearing Capacity

Footings must bear on undisturbed soil or compacted granular fill per specifications with a minimum bearing capacity of 3000 psf. It is the responsibility of the concrete contractor to verify this value. If soil at the bottom of a footing is of questionable value, notify the local project engineer.

Deviation from Published Specifications

Foundation drawings from Rice Lake Weighing Systems include all dimensions, steel reinforcement details, and concrete mix specifications to complete the foundation construction. Estimated material quantities are also included on the drawings. Any deviations from the published drawings must be approved in writing from Rice Lake Weighing Systems.

Concrete Sampling

A schedule of concrete sampling sets taken in approved cylinders per ASTM C31, C39, and C172 is detailed on the drawings. A set of cylinders is to be broken at 7 days and 28 days by an approved soil testing facility, and a third set is to be stored by the concrete contractor and maintained in good condition.

Concrete, Rebar, and Mesh Requirements

Materials estimates for concrete foundations (slab or pier), approaches, standard 34' long ramps, and decks can be drawn from the following charts. The charts include the most popular truck scale models from 11' x 60' up to 14' x 93'. Note that either a reinforced slab foundation, or a pier foundation may be used with any of the scale models.

The following charts assume that the pier foundations do not include a concrete cleanout pad around the piers beneath the weighbridge. If adding a concrete cleanout pad, increase concrete quantity accordingly.

The charts assume standard 10' approaches and 34' long concrete ramps to final grade.

EZ scale decks are poured using either Polyfill fibermesh concrete or standard 4,000 psi concrete and 6" x 6" x 10 gauge steel reinforcing mesh.

SR scale decks require corrugated sheeting (to support concrete) and rebar to be obtained locally and added on site. Rebar sizes and exact quantities are listed on the assembly drawings for each scale. Corrugated sheeting quantities can be estimated by adding 20% to the square footage of the scale deck area.

These charts are for preliminary estimating purposes only. For exact material quantities and sizes, refer to the drawing # referenced with each scale model in the charts.

Foundation and Deck Material for 11' SR-Series Scales

Scale	(Drawing #)	Quantities	SR Deck	Reinforced Slab Foundation			Pier Foundation w/o cleanouts		
				Base	Approaches	Ramps	Base	Approaches	Ramps
11' x 60' 100 ton 3 module	Deck (45810)	Concrete	16 yds^3	33 yds^3	16 yds^3	36 yds^3	31 yds^3	22 yds^3	36 yds^3
	Slab (45808)	Rebar	2283 lb	4619 lb		1488 lb	3004 lb		1488 lb
	Pier (45809)	Mesh		840 ft^2	280 ft^2	952 ft^2		280 ft^2	952 ft^2
11' x 70' 60 ton 2 module	Deck (45802)	Concrete	18 yds^3	31 yds^3	16 yds^3	36 yds^3	26 yds^3	22 yds^3	36 yds^3
	Slab (45800)	Rebar	2655 lb	4034 lb		1488 lb	2848 lb		1488 lb
	Pier (45801)	Mesh		980 ft^2	280 ft^2	952 ft^2		280 ft^2	952 ft^2
11' x 70' 100 ton 3 module	Deck (45351)	Concrete	18 yds^3	36 yds^3	16 yds^3	36 yds^3	31 yds^3	22 yds^3	36 yds^3
	Slab (45349)	Rebar	2690 lb	4620 lb		1488 lb	3004 lb		1488 lb
	Pier (45350)	Mesh		980 ft^2	280 ft^2	952 ft^2		280 ft^2	952 ft^2
11' x 80' 100 ton 4 module	Deck (45805)	Concrete	21 yds^3	42 yds^3	16 yds^3	36 yds^3	37 yds^3	22 yds^3	36 yds^3
	Slab (45803)	Rebar	5206 lb	5206 lb		1488 lb	3372 lb		1488 lb
	Pier (45804)	Mesh		1120 ft^2	280 ft^2	952 ft^2		280 ft^2	952 ft^2
11' x 93' 100 ton 4 module	Deck (45807)	Concrete	24 yds^3	45 yds^3	16 yds^3	36 yds^3	37 yds^3	22 yds^3	36 yds^3
	Slab (45837)	Rebar	3579 lb	5806 lb		1488 lb	3372 lb		1488 lb
	Pier (45806)	Mesh		840 ft^2	280 ft^2	952 ft^2		280 ft^2	952 ft^2

Foundation and Deck Material for 12' SR-Series Scales

Scale	(Drawing #)	Quantities	SR Deck	Reinforced Slab Foundation			Pier Foundation w/o cleanouts		
				Base	Approaches	Ramps	Base	Approaches	Ramps
12 x 60' 100 ton 3 module	Deck (45799)	Concrete	17 yds^3	36 yds^3	16 yds^3	38 yds^3	33 yds^3	23 yds^3	38 yds^3
	Slab (45797)	Rebar	2446 lb	4621 lb		1594 lb	3168 lb		1594 lb
	Pier (45798)	Mesh		900 ft^2	300 ft^2	1020 ft^2		300 ft^2	1020 ft^2
12' x 70' 60 ton 2 module	Deck (45790)	Concrete	20 yds^3	34 yds^3	16 yds^3	38 yds^3	26 yds^3	23 yds^3	38 yds^3
	Slab (45788)	Rebar	2915 lb	4265 lb		1594 lb	2848 lb		1594 lb
	Pier (45789)	Mesh		1050 ft^2	300 ft^2	1020 ft^2		300 ft^2	1020 ft^2
12' x 70' 100 ton 3 module	Deck (45282)	Concrete	20 yds^3	38 yds^3	16 yds^3	38 yds^3	33 yds^3	23 yds^3	38 yds^3
	Slab (45280)	Rebar	2882 lb	4887 lb		1594 lb	3168 lb		1594 lb
	Pier (45281)	Mesh		1050 ft^2	300 ft^2	1020 ft^2		300 ft^2	1020 ft^2
12' x 80' 100 ton 4 module	Deck (45793)	Concrete	23 yds^3	45 yds^3	16 yds^3	38 yds^3	40 yds^3	23 yds^3	38 yds^3
	Slab (45791)	Rebar	3262 lb	5512 lb		1594 lb	3488 lb		1594 lb
	Pier (45792)	Mesh		1230 ft^2	300 ft^2	1020 ft^2		300 ft^2	1020 ft^2
12' x 93' 100 ton 4 module	Deck (45796)	Concrete	26 yds^3	48 yds^3	16 yds^3	38 yds^3	40 yds^3	23 yds^3	38 yds^3
	Slab (45794)	Rebar	3833 lb	5828 lb		1594 lb	3488 lb		1594 lb
	Pier (45795)	Mesh		1402 ft^2	300 ft^2	1020 ft^2		300 ft^2	1020 ft^2

Foundation and Deck Material for 14' SR-Series Scales

Scale	(Drawing #)	Quantities	SR Deck	Reinforced Slab Foundation Base	Approaches	Ramps	Pier Foundation w/o cleanouts Base	Approaches	Ramps
14' x 60' 100 ton 3 module	Deck (45787)	Concrete	20 yds^3	40 yds^3	18 yds^3	44 yds^3	38 yds^3	25 yds^3	44 yds^3
	Slab (45785)	Rebar	2827 lb	5490 lb		1802 lb	3578 lb		1802 lb
	Pier (45786)	Mesh		1020 ft^2	340 ft^2	1156 ft^2		340 ft^2	1156 ft^2
14' x 70' 60 ton 2 module	Deck (45784)	Concrete	23 yds^3	38 yds^3	18 yds^3	44 yds^3	31 yds^3	25 yds^3	44 yds^3
	Slab (45782)	Rebar	3432 lb	4792 lb		1802 lb	3217 lb		1802 lb
	Pier (45783)	Mesh		1190 ft^2	340 ft^2	1156 ft^2		340 ft^2	1156 ft^2
14' x 70' 100 ton 3 module	Deck (44681)	Concrete	23 yds^3	43 yds^3	18 yds^3	44 yds^3	38 yds^3	25 yds^3	44 yds^3
	Slab (44348)	Rebar	3439 lb	5478 lb		1802 lb	3578 lb		1802 lb
	Pier (44349)	Mesh		1224 ft^2	340 ft^2	1156 ft^2		340 ft^2	1156 ft^2
14' x 80' 100 ton 4 module	Deck (45299)	Concrete	26 yds^3	51 yds^3	18 yds^3	44 yds^3	46 yds^3	25 yds^3	44 yds^3
	Slab (45297)	Rebar	3739 lb	6092 lb		1802 lb	3936 lb		1802 lb
	Pier (45298)	Mesh		1360 ft^2	340 ft^2	1156 ft^2		340 ft^2	1156 ft^2
14' x 93' 100 ton 4 module	Deck (45781)	Concrete	30 yds^3	43 yds^3	18 yds^3	44 yds^3	46 yds^3	25 yds^3	44 yds^3
	Slab (45779)	Rebar	4430 lb	6206 lb		1802 lb	3936 lb		1802 lb
	Pier (45780)	Mesh		1590 ft^2	340 ft^2	1156 ft^2		340 ft^2	1156 ft^2

Checklist of Foundation Questions

Most truck scale installation companies will subcontract the concrete foundation work to a local firm specializing in that work. The foundation drawings include specifications and requirements in sufficient detail so subcontractors can bid directly from the drawings. As in all subcontracting, however, peripheral items require a clear understanding of the party responsible for each item. The following list—though not exhaustive—will help in the designation of responsibility.

Permits

Who gets permits?
Who is billed for permits?

Obstructions and Utilities

If required, who removes underground obstructions (ex. large rocks)?
Who contacts utilities or Digger's Hotline? Are there scheduling issues?

Entrance and Exit Ramps

Is there adequate space for vehicles to move straight onto the scale?
Is there adequate space for the truck to be driven off the scale before starting a turn?
Is there adequate space for the scale plus NTEP approaches?
Is additional ramping needed beyond the approaches?
Who provides such additional ramps?
What surface will be used for the ramps?
Who removes material after construction?

Excavation

Who does excavation? Dealer _____ End User _____ Third party _____
Will soil beneath footings support 3000 psf? Are soil borings necessary to verify?
What type and amount of backfill is necessary?
Who does backfill and landscaping? Dealer _____ End User _____ Third party _____

Base for Concrete

Who gets sand and fill gravel?
Is mechanical compaction necessary to achieve 98% standard Proctor density?
Who is billed for sand and gravel?

Steel Reinforcing and Concrete Scale Foundation

Who gets rebar and mesh?
Who gets concrete?
Who is billed for concrete?
How long will concrete require moist-curing?
Will epoxy seal/cure agent be used?
Who stores cylinders of concrete samples?
Who does destructive testing of samples?

Approaches

Who does approaches per NTEP guidelines?
Who provides the anchored angle-iron bulkhead strips?
Who provides bumper plates if necessary?

Trenching

Who does trenching for conduit and ground cable?
Who provides backfill for conduit trenching?
What type of backfill is necessary?

Conduit

Who gets conduit?
What type and amount of conduit is required for peripheral items (indicator, scale intercom, remote display, gate buzzer, traffic lights, wand reader/RFI reader, etc.)?

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measurement_standards/msdinfo.html

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Installation Information

SR Series Assembly Overview

The individual components and modular sections of the SURVIVOR Siderail truck scales assemble smoothly following a proven construction sequence. Some of the steps may change slightly depending on whether you have working access to both or only one side of the scale. Assembling a single-platform gross weighing scale, or a multi-platform axle weighing model, will require slightly different steps, but the general assembly order (summarized below) will be similar. Detailed directions are found in the *SR Truck Scales Assembly Instructions* available from Rice Lake Weighing Systems.

1. Set siderails on setting blocks and bolt on cross beams
2. Level and align frame, then tighten all bolts to final torque values
3. Set mounts and load cells; remove blocks
4. Install anchor bolts and grout mounts
5. Install support bars, corrugated sheet metal, and rebar for concrete deck
6. Pour concrete deck
7. Install conduit, cabling, and junction boxes
8. Connect indicator and peripheral devices

Scheduling and Labor Guidelines for SR Series Installation

When scheduling crane/forklift rental for the unloading and frame placement, arrange a full day and a crew of at least two assemblers. If the truck with scale components is on site in the morning, a two-man crew aided by a crane or forklift can normally unload the truck and set, align, and bolt all frame components and load cells in place before evening. A truck-loading diagram for the scale included with the installation manual specifies the most efficient unloading sequence to avoid double handling.

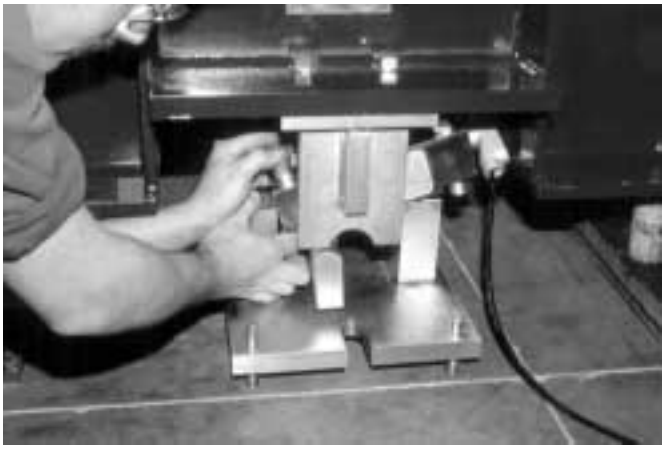
The second day, a crew of three or four can normally prepare the scale deck for concrete, then pour and finish the deck surface before evening.

The third day, a crew of two can normally complete all electrical wiring in conduit on the scale while the concrete deck moist-cures.

Recommended Equipment and Tools

Crane with a minimum 6,000 lb capacity, *or*
Fork truck with 8' boom extension
Air compressor and impact wrench with 1" drive
3/4" rotary hammer drill
3/4" x 36" masonry carbide bit
Low-profile (8" ht.) 10-ton hydraulic jacks
8" setting blocks
Chain winches (2) with 16' chains and hooks
Torque wrench to 700 ft.lbs. with extension handle
Box end and 1" drive socket wrenches to 1-1/2"
4' bubble level or laser level
Small torpedo level
Chalkline
100' measuring tape
25' measuring tape
Hammers and maul
Hack saw, metal snips
1-1/2" rebar chairs and metal ties
Rebar twist tie spinner tool
Concrete vibrator (for deck concrete pour)
Concrete trowels, edger, bull float, broom
Hand tools for wiring and conduit installation

EZ Series Assembly Overview



The modular sections of the SURVIVOR EZ truck scales are shipped pre-assembled and ready to be placed into position with a crane capable of handling 8,000 lbs. Once in final position on temporary setting blocks, the individual modules are bolted together. Load cells and mounts are set to the level of the deck, at which time the setting blocks can be removed. Fibermesh concrete with polypropylene fibers (or standard 4000 psi concrete and 6" x 6" x 10 gauge steel mesh) is then poured and cured for the final deck surface. The general assembly order is summarized below. Detailed directions are found in the *EZ Truck Scales Assembly Instructions* available from Rice Lake Weighing Systems.

1. With a crane, set modules into position on setting blocks
2. Level and bolt modules together
3. Set mounts and load cells to weighbridge; remove setting blocks
4. Install mount anchor bolts and grout beneath mount plates
5. Pour and finish concrete deck
6. Run cabling through conduit and make electrical connections
7. Connect indicator and peripheral devices

Scheduling and Labor Guidelines for EZ Series Installation

When scheduling installation, plan for a half-day crane rental. A two-man crew aided by a crane can place the modules, bolt them together, and install mounts and load cells in one day.

A crew of three can normally pour and finish the deck surface in the morning of the second day. A crew of two can normally run all electrical wiring in conduit and make electrical connections in the afternoon of the second day.

Recommended Equipment and Tools

Crane with a minimum 8,000 lb capacity
Four clevises, four hooks and lifting harness
3/4" rotary hammer drill
3/4" x 36" masonry carbide bit
Low-profile (8" ht.) 4-ton hydraulic jacks
8" setting blocks
Torque wrench to 700 ft. lbs. with extension handle
Box end and 1" drive socket wrenches to 1-1/2"
4' bubble level or laser level
Small torpedo level
Chalkline
Hammers and maul
Concrete vibrator and power trowel (optional)
Concrete hand trowels, edger, bull float, broom
Hand tools for pulling and connecting electrical wiring

Engineering Details

SR Series Engineering Specifications Sheet

TRUCK SCALE BID to provide _____truck scale weighing system(s) installed at _____ for _____.

Each truck scale shall be _____ feet long x _____feet wide with a full scale capacity of _____ tons. Concrete deck is to be quoted. All quoted units will be NTEP approved.

Each truck scale shall be equipped with a digital indicator and ticket printer.
Quote installation and calibration separately.
Material handling equipment is to be provided by others.
Foundation and concrete work to be provided by others.

	Load Sensing Elements	**Pricing**
1.0	Load sensors will be strain gauge load cells.	Included as standard
1.1	Capacity will be 75,000 lbs each.	Included as standard
1.2	Load cells will be fully electronic, and carry a two-year warranty.	Included as standard
1.3	Load cells shall be NTEP-approved.	Included as standard
1.4	Load cells should be available from multiple sources without affecting NTEP approval(s).	Included as standard
1.5	Load cells shall be double-ended, shear-beam, analog-output type with a single loading link.	Included as standard
1.6	Conduit fittings will be provided for each load cell.	Included as standard
1.7	Load cells shall have 60 feet of load cell cable.	Included as standard

	Load Cell Mounting and Suspension	
2.0	Load cells should not require separate checking mechanisms outside the mount.	Included as standard
2.1	Mounts shall be easy to install from the top and side of the scale.	Included as standard
2.2	Anchor bolts and levelling lugs will be provided with each mount assembly.	Included as standard
2.3	Transient bypass cables will be provided for each mount assembly. Lugs and fasteners included.	Included as standard

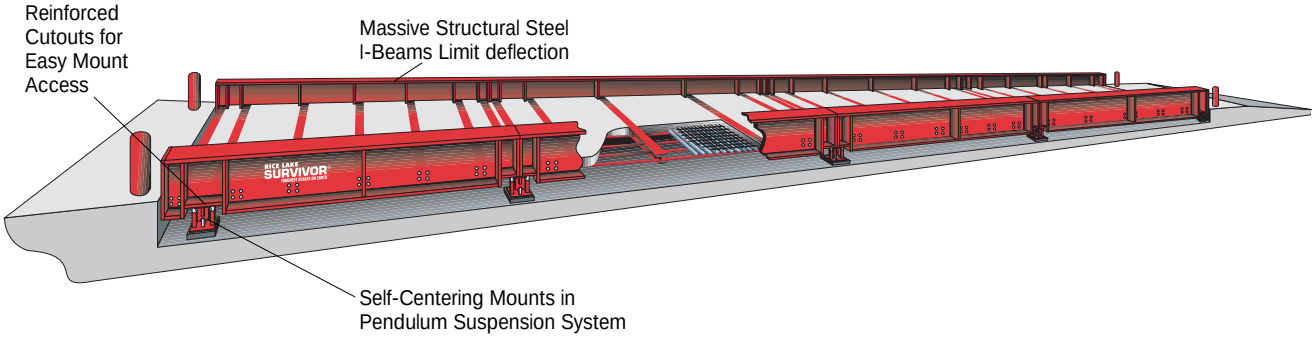
	Cables, Electronics, and Junction Boxes	
3.0	All load cell cable shall be routed in conduit. The 30" section at each end to be flexible conduit, the remainder to be 3/4" galvanized metal conduit.	Included as standard
3.1	Summing junction boxes to be FRP type with NEMA 4 rating and to include metal backing plate for mounting PCB boards.	Included as standard
3.2	Summing junction boxes will have 3/4" conduit connectors for each load cell cable and the homerun cable(s) if appropriate.	Included as standard
3.3	Summing boxes will be large enough to coil all excess cable inside.	Included as standard
3.4	Summing boxes will have clear polycarbonate shields to protect the PCBs from the coiled cables.	Included as standard
3.5	Transient protection option PCB will fit in each summing box, on metal mounting plate behind clear polycarbonate cover.	Included as standard
3.6	If two summing boxes are required, a third box will be included as a terminal box, or as a transient “breakpoint” when the optional transient protection package is included.	Included as standard

Weighbridge		**Pricing**
4.0	The weighbridge is a bolt-together scale assembled on site.	Included as standard
4.1	The maximum scale capacity shall be 200,000 lbs.	Included as standard
4.2	CLC rating is 70,000 lbs for scales under 35 ft. long CLC rating is 90,000 lbs for scales over 35 ft. long	Included as standard
4.3	"r" factor per Federal Bridge Standards is: 2.06 for a scale under 35 ft. long 2.65 for a scale over 35 ft. long	Included as standard
4.4	Deflection ratio is 1:900 of longest span under maximum point load rating (CLC or dual-axle loading).	Included as standard
4.5	Weighbridge minimum height is 17" high (6.5" cleanout space).	Included as standard
4.6	Designed for 8" thick reinforced concrete deck.	Included as standard
4.7	Side and top access to load cells for ease in adjustments.	Included as standard
4.8	NTEP-approved weighing surface up to 14-foot wide.	Included as standard
4.9	Siderails extend a minimum 16" above the weighing surface to provide protection for trucks and personnel in icy conditions.	Included as standard
4.10	Scale deck does not require checkrods, staybars, or bumper bolts.	Included as standard
4.11	All surfaces to be cleaned and phosphatized prior to painting.	Included as standard
4.12	Weighbridge steel is painted with Vankyd gloss enamel, a waterborne corrosion-preventative coating. Vankyd enamel provides an effective barrier against corrosive environments for ferrous and nonferrous fabrications. Cures to touch in 45 minutes, total cure in 24 hours.	Included as standard
4.13	COATINGS SAFETY INFORMATION	
	4.131 This paint is considered nonhazardous under OSHA hazardous communication standard (29CFR 1910.1200)	
	4.132 This paint is not a "controlled product" under CANADIAN Workplace Hazardous Materials Information Systems (WHMIS).	
	4.133 Material is not regulated by US DOT.	
4.14	Weighbridge construction conforms to Federal Bridge Standards.	Included as standard
4.15	Weighbridge certified by licensed, independent Professional Engineer.	Included as standard
4.16	Drawings packages shall include one set of full "D" size drawings and one set of 11" x17" size drawings for file purposes.	Included as standard
4.17	Weighbridge shall be warranted for ten (10) years.	Included as standard

Indication and Printing		
5.0	Indicator must be NTEP-approved, Class IIIL.	Included as standard
5.1	Indicator must be compatible with all other scale-related peripheral products supplied, and the truck scale manufacturer must assume responsibility for interfacing capabilities.	Included as standard
5.2	Ticket printers must be able to print 5-part multicopy forms.	Included as standard

SURVIVOR® SR Series Specifications

The SURVIVOR SR Series truck scales feature a low-profile 8-inch thick steel and concrete weighbridge, and up to a 14-foot wide loading area for greater safety and faster processing during peak usage times. The 24-inch main I-beams limit deflection under heavy loads, and cross members every 4 feet spread the loads more evenly for less flexing and a longer life cycle. The SURVIVOR SR Series truck scales maintain accuracy even with a 90,000 lb load (on 4-foot centers) in mid span. SR scale decks offer the strength and width to perform in industrial applications where loads exceed normal highway loads. Weighbridge deflection is less than 1:900 (e.g., 0.26 inches on a 20-foot span). Less deflection means less cumulative metal fatigue and much longer life cycles.



Standard Equipment Supplied by RLWS

Weighbridge steel; weighbridge fasteners; load cells with 60 ft. of cable and conduit fitting; load cell mounts with leveling bolts and anchor bolts; copper transient bypass cables at each load cell; conduit fitting for load cell; flexible plastic conduit (30" long) from load cell to metal conduit; conduit fittings from plastic to metal conduit; FRP junction box(s) with appropriate number of cable clamps and back plane; summing board with clear mylar cover plate; homerun cable to indicator (60' long); print packages for deck assembly, reinforced slab foundation, pier foundation, and rebar placement for deck concrete; and detailed installation manual with truck loading/unloading diagram.

Distributor Supplied Equipment

Metal conduit on weighbridge for load cell cable runs; corrugated sheeting for deck; rebar for concrete deck; approach ramp(s) bulkhead; foundation alignment posts; rebar and mesh for foundation; concrete; indicator; printer; freight charges including material handling, shipping charges, transportation permits and fees, escort(s) charge and insurance transportation fees.

Standard Features

- Weighbridge modules for creating custom lengths
- 75,000-lb capacity load cells and mount assemblies
- Junction box appropriate for number of load cells utilized
- NTEP certified, CC #98-011/98-011A1
- Up to 90,000 lb Concentrated Load Capacity (CLC)
- Up to 2.65 “r” factor
- Up to 200,000 lb full scale capacity
- Very low deflection factor (1:900) under extreme overload
- 8" thick reinforced concrete deck
- Three standard widths: 11 ft, 12 ft, and 14 ft.
- Lengths from 10 ft through 117 ft

Applications

- Mining
- Landfills
- Grain processing
- Cement and asphalt plants

Options/Accessories

- Lightning Protection Package
- Special quotes

Consult catalog for these additional options

- IQ plus® series digital indicators
- Ticket and document printers
- 4" or 6" remote flip-digit displays
- TransAct®/TransAct Plus® data management software
- Unattended truck scale system (AST-2)
- Concrete batching control system

SURVIVOR SR Series Specifications

LOAD CELLS AND MOUNT ASSEMBLIES:
75,000 lb capacity; self centering load cell mount design with no checkrods required

"r" FACTOR:
2.65 (35' to 117') (dual axle design load, e.g., 90,000 lb ÷ 34,000 lb); 2.06 (10' to 34'

FULL SCALE CAPACITY:
Up to 200,000 lb (x 20 lb)

DEFLECTION FACTOR:
1:900 of span distance

CONCENTRATED LOAD CAPACITY (CLC):
90,000 lb (35 ft to 117 ft); 70,000 lb (7 ft to 34 ft)

APPROVALS:
NTEP-certified per H-44, Class IIIL, CC #98-011

WARRANTY:
Ten-year limited warranty on the weighbridge
Two-year limited warranty on load cells/electronics
Up to five-year "build your own" lightning extended warranty

SR SERIES – 11 FOOT WIDTH

LENGTH	FULL SCALE CAPACITY	PART NUMBER	MODEL NUMBER	SHIPPING WEIGHT	NUMBER OF MODULES	NUMBER OF LOAD CELLS	"r" FACTOR	CLC (TONS)
10 ft	60 tons	44566	SR1011-SC-60	5,300 lb	1	4	2.06	35
20 ft	60 tons	44567	SR2011-SC-60	8,200 lb	1	4	2.06	35
24 ft*	60 tons	44568	SR2411-SC-60	9,300 lb	1	4	2.06	35
35 ft	60 tons	44569	SR3511-SC-60	16,100 lb	1	4	2.65	45
40 ft	60 tons	44570	SR4011-SC-60	15,500 lb	2	6	2.65	45
47 ft*	60 tons	44571	SR4711-SC-60	18,200 lb	2	6	2.65	45
60 ft	100 tons	44572	SR6011-SC-100	23,000 lb	3	8	2.65	45
70 ft	60 tons	44573	SR7011-SC-60	31,400 lb	2	6	2.65	45
70 ft	100 tons	44574	SR7011-SC-100	26,800 lb	3	8	2.65	45
80 ft	100 tons	44575	SR8011-SC-100	30,500 lb	4	10	2.65	45
93 ft*	100 tons	44576	SR9311-SC-100	35,300 lb	4	10	2.65	45
100 ft	100 tons	44577	SR10011-SC-100	38,000 lb	5	12	2.65	45
117 ft*	100 tons	44578	SR11711-SC-100	44,300 lb	5	12	2.65	45

SR SERIES – 12 FOOT WIDTH

LENGTH	FULL SCALE CAPACITY	PART NUMBER	MODEL NUMBER	SHIPPING WEIGHT	NUMBER OF MODULES	NUMBER OF LOAD CELLS	"r" FACTOR	CLC (TONS)
10 ft	60 tons	44579	SR1012-SC-60	5,500 lb	1	4	2.06	35
20 ft	60 tons	44580	SR2012-SC-60	8,400 lb	1	4	2.06	35
24 ft*	60 tons	44581	SR2412-SC-60	9,500 lb	1	4	2.06	35
35 ft	60 tons	44582	SR3512-SC-60	16,400 lb	1	4	2.65	45
40 ft	60 tons	44583	SR4012-SC-60	15,900 lb	2	6	2.65	45
47 ft*	60 tons	44584	SR4712-SC-60	18,700 lb	2	6	2.65	45
60 ft	100 tons	44585	SR6012-SC-100	23,600 lb	3	8	2.65	45
70 ft	60 tons	44586	SR7012-SC-60	32,000 lb	2	6	2.65	45
70 ft	100 tons	44587	SR7012-SC-100	27,500 lb	3	8	2.65	45
80 ft	100 tons	44588	SR8012-SC-100	31,200 lb	4	10	2.65	45
93 ft*	100 tons	44589	SR9312-SC-100	36,200 lb	4	10	2.65	45
100 ft	100 tons	44590	SR10012-SC-100	38,900 lb	5	12	2.65	45
117 ft*	100 tons	44591	SR11714-SC-100	45,400 lb	5	12	2.65	45

SR SERIES – 14 FOOT WIDTH

LENGTH	FULL SCALE CAPACITY	PART NUMBER	MODEL NUMBER	SHIPPING WEIGHT	NUMBER OF MODULES	NUMBER OF LOAD CELLS	"r" FACTOR	CLC (TONS)
10 ft	60 tons	44592	SR1014-SC-60	5,800 lb	1	4	2.06	35
20 ft	60 tons	44593	SR2014-SC-60	8,800 lb	1	4	2.06	35
24 ft*	60 tons	44594	SR2414-SC-60	10,100 lb	1	4	2.06	35
35 ft	60 tons	44595	SR3514-SC-60	17,000 lb	1	4	2.65	45
40 ft	60 tons	44596	SR4014-SC-60	16,700 lb	2	6	2.65	45
47 ft*	60 tons	44597	SR4714-SC-60	19,600 lb	2	6	2.65	45
60 ft	100 tons	44598	SR6014-SC-100	24,700 lb	3	8	2.65	45
70 ft	60 tons	44599	SR7014-SC-60	33,200 lb	2	6	2.65	45
70 ft	100 tons	44600	SR7014-SC-100	28,800 lb	3	8	2.65	45
80 ft	100 tons	44601	SR8014-SC-100	32,700 lb	4	10	2.65	45
93 ft*	100 tons	44602	SR9314-SC-100	38,000 lb	4	10	2.65	45
100 ft	100 tons	44603	SR10014-SC-100	40,700 lb	5	12	2.65	45
117 ft*	100 tons	44604	SR11714-SC-100	47,600 lb	5	12	2.65	45

* 24 ft actual = 23' 4", 47 ft actual = 46' 8", 93 ft actual = 92' 4", 117 ft actual = 116' 8"

SURVIVOR® EZ Series Engineering Specifications Sheet

TRUCK SCALE BID to provide _____truck scale weighing system(s) installed at _____ for _____.

Each truck scale shall be _____ feet long x _____feet wide with a full scale capacity of _____ tons. Concrete deck is to be quoted. All quoted units will be NTEP approved.

Each truck scale shall be equipped with a digital indicator and ticket printer.
All metrological components shall be from the same vendor.

Quote installation and calibration separately.
Material handling equipment is to be provided by others.
Foundation and concrete work to be provided by others.

Load Sensing Elements		**Pricing**
1.0	Load sensors will be strain gauge load cells.	Included as standard
1.1	Capacity will be 75,000 lbs each.	Included as standard
1.2	Load cells will be fully electronic, and carry a two-year warranty.	Included as standard
1.3	Load cells shall be NTEP-approved.	Included as standard
1.4	Load cells should be available from multiple sources without affecting NTEP approval(s).	Included as standard
1.5	Load cells shall be double-ended, shear-beam, analog-output type with a single loading link.	Included as standard
1.6	Conduit fittings will be provided for each load cell.	Included as standard
1.7	Load cells shall have 60 feet of load cell cable.	Included as standard

Load Cell Mounting and Suspension		
2.0	Mounts shall be easy to install from the top and side of the scale.	Included as standard
2.1	Anchor bolts and levelling lugs will be provided with each mount assembly.	Included as standard
2.2	Transient bypass cables will be provided for each mount assembly. Lugs and fasteners included.	Included as standard

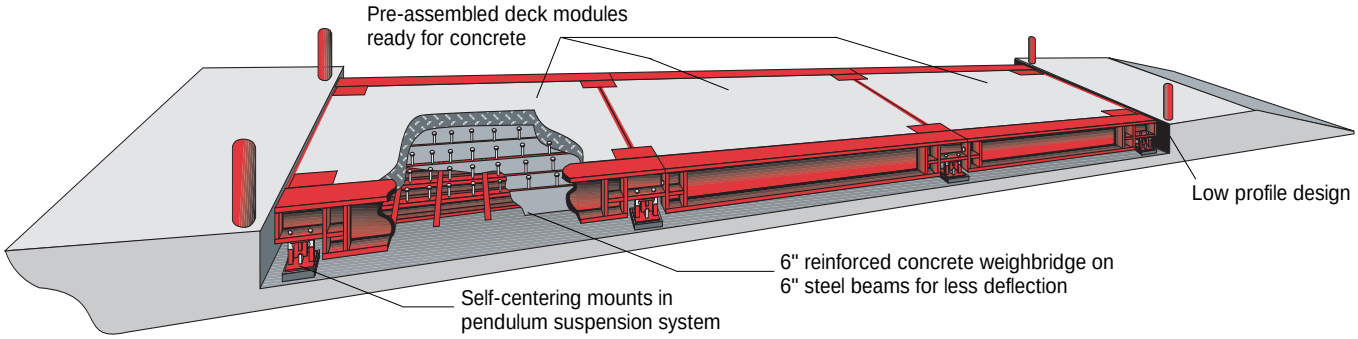
Cables, Electronics, and Junction Boxes		
3.0	All load cell cable shall be routed in conduit. The 30" section at each end to be flexible conduit, the remainder to be 3/4" galvanized metal conduit.	Included as standard
3.1	Summing junction boxes to be FRP type with NEMA 4 rating and to include metal backing plate for mounting PCB boards.	Included as standard
3.2	Summing junction boxes will have 3/4" conduit connectors for each load cell cable and the homerun cable(s) if appropriate.	Included as standard
3.3	Summing boxes will be large enough to coil all excess cable inside.	Included as standard
3.4	Summing boxes will have clear polycarbonate shields over the PCBs to protect the PCBs from the coiled cables.	Included as standard
3.5	Transient protection option PCB will fit in each summing box, on metal mounting plate behind clear polycarbonate cover.	Included as standard
3.6	If two summing boxes are required, a third box will be included as a terminal box, or as a transient “breakpoint” when the optional transient protection package is included.	Included as standard

Weighbridge		**Pricing**
4.0	The weighbridge is pre-assembled and ready for concrete.	Included as standard
4.1	The maximum scale capacity shall be 200,000 lbs.	Included as standard
4.2	CLC rating is 70,000 lbs.	Included as standard
4.3	“r” factor per Federal Bridge Standards is 2.06	Included as standard
4.4	Deflection ratio is 1:700 of longest span under maximum point load rating (CLC or dual-axle loading).	Included as standard
4.5	Weighbridge minimum height is 19" high (6.5" cleanout space).	Included as standard
4.6	Designed for 6" thick reinforced concrete deck.	Included as standard
4.7	Side and top access to load cells for ease in adjustments.	Included as standard
4.8	NTEP-approved weighing surface up to 12-foot wide.	Included as standard
4.9	All surfaces to be cleaned and phosphatized prior to painting.	Included as standard
4.10	Weighbridge steel is painted with Vankyd gloss enamel, a waterborne corrosion-preventative coating. Vankyd enamel provides an effective barrier against corrosive environments for ferrous and nonferrous fabrications. Cures to touch in 45 minutes, total cure in 24 hours.	Included as standard
4.11	Emulsified asphalt rust preventative on surfaces not exposed	Included as standard
4.12	COATINGS SAFETY INFORMATION	
	4.121 Paint is considered nonhazardous under OSHA hazardous communication standard (29CFR 1910.1200)	
	4.122 Paint is not a “controlled product” under CANADIAN Workplace Hazardous Materials Information Systems (WHMIS).	
	4.123 Material is not regulated by US DOT.	
	4.124 Emulsified asphalt has no VOC’s	
4.13	Galvanized plates for concrete deck supports	Included as standard
4.14	Weighbridge construction conforms to Federal Bridge Standards.	Included as standard
4.15	Weighbridge certified by licensed, independent Professional Engineer.	Included as standard
4.16	Drawings packages shall include one set of full “D” size drawings and one set of 11"x17" size drawings for file purposes.	Included as standard
4.17	Weighbridge shall be warranted for five (5) years.	Included as standard

Indication and Printing		
5.0	Indicator must be NTEP-approved, Class IIIL.	Included as standard
5.1	Indicator must be compatible with all other scale-related peripheral products supplied, and the truck scale manufacturer must assume responsibility for interfacing capabilities.	Included as standard
5.2	Ticket printers must be able to print 5-part multicopy forms.	Included as standard

SURVIVOR® EZ Series Specifications

The SURVIVOR EZ Series vehicle scales feature a low-profile 12.5-inch thick steel and concrete weighbridge, and up to a 12-foot wide loading area for greater safety and faster processing during peak usage times. A unique steel/concrete weighbridge assembly allows for less deflection even under heavy loads. Less deflection means longer weighbridge life cycles. The SURVIVOR EZ Series vehicle scales maintain legal-for-trade accuracy even with a 70,000 lb concentrated load in mid span of the weighbridge. The weighbridge deflection is less than 1:700 (e.g., 0.34 inches on a 20-foot span). Less deflection means less cumulative metal fatigue and much longer life cycles. Factory-assembled scale modules are shipped ready to place into position and pour with either fibermesh concrete or standard concrete and 6 x 6 x 10 steel mesh.



Standard Equipment Supplied by RLWS

Assembled weighbridge modules; module connectors; load cells with 60 ft. of cable and conduit fitting; load cell mounts with leveling bolts and anchor bolts; copper transient bypass cables at each load cell; flexible plastic conduit (30" long) from load cell to metal conduit; conduit fittings from plastic to metal conduit; FRP junction box(s) with appropriate number of cable clamps and back plane; summing board with clear mylar cover plate; homerun cable to indicator (60' long): print packages for reinforced slab foundation, pier foundation, and final assembly; installation manual, and truck loading/unloading diagram.

Distributor Supplied Equipment

Metal conduit on weighbridge for load cell cable runs; approach ramp(s) bulkhead; foundation alignment posts; rebar and mesh for foundation; concrete; 6" x 6" deck mesh; indicator; printer; freight charges including material handling, shipping charges, transportation permits and fees, escort(s) charge, and insurance transportation fees.

Standard Features

- Weighbridge modules for creating custom lengths
- 75,000-lb capacity load cells and mount assemblies
- Junction box appropriate for number of load cells utilized
- NTEP certified, CC #98-041
- Up to 70,000 lb Concentrated Load Capacity (CLC)
- 2.06 “r” factor
- Up to 200,000 lb full scale capacity
- Extra low deflection (1:700) under extreme overload
- 6" thick concrete deck
- Three standard widths: 10 ft, 11 ft, and 12 ft
- Lengths from 10 ft through 117 ft
- Undercarriage rust-proofed with sprayed asphalt emulsion

Applications

- Mining
- Landfills
- Grain processing
- Cement and asphalt plants

Options/Accessories

- Lightning protection package
- Special quotes

Consult catalog for these additional options

- IQ plus® series digital indicators
- Ticket and document printers
- 4" or 6" remote flip-digit displays
- TransAct®/TransAct Plus® data management software
- Unattended truck scale system (AST-2)
- Concrete batching control system

SURVIVOR EZ Series Specifications

LOAD CELLS AND MOUNT ASSEMBLIES:
75,000 lb capacity; self centering load cell mount design

"r" FACTOR:
2.06 (dual axle design load, e.g., 70,000 lb ÷ 34,000 lb)

FULL SCALE CAPACITY:
Up to 200,000 lb (x 20 lb)

DEFLECTION FACTOR:
1:700 of span distance

CONCENTRATED LOAD CAPACITY (CLC):
70,000 lb to 117 ft

APPROVALS:
NTEP-certified per H-44, Class IIIL, CC #98-041

WARRANTY:
Five-year limited warranty on the weighbridge
Two-year limited warranty on load cells/electronics
Up to five-year "build your own" lightning extended warranty

EZ SERIES – 10 FOOT WIDTH

LENGTH	FULL SCALE CAPACITY	PART NUMBER	MODEL NUMBER	SHIPPING WEIGHT	NUMBER OF MODULES	NUMBER OF LOAD CELLS	"r" FACTOR	CLC (TONS)
10 ft	60 tons	44605	EZ1010-SC-60	4,700 lb	1	4	2.06	35
20 ft	60 tons	44606	EZ2010-SC-60	7,400 lb	1	4	2.06	35
24 ft*	60 tons	44607	EZ2410-SC-60	8,200 lb	1	4	2.06	35
40 ft	60 tons	44608	EZ4010-SC-60	13,900 lb	2	6	2.06	35
47 ft*	60 tons	44609	EZ4710-SC-60	15,700 lb	2	6	2.06	35
60 ft	100 tons	44610	EZ6010-SC-100	20,400 lb	3	8	2.06	35
70 ft	100 tons	44611	EZ7010-SC-100	23,200 lb	3	8	2.06	35
80 ft	100 tons	44612	EZ8010-SC-100	26,900 lb	4	10	2.06	35
93 ft*	100 tons	44613	EZ9310-SC-100	30,700 lb	4	10	2.06	35
100 ft	100 tons	44614	EZ10010-SC-100	33,400 lb	5	12	2.06	35
117 ft*	100 tons	44615	EZ11710-SC-100	38,200 lb	5	12	2.06	35

EZ SERIES – 11 FOOT WIDTH

LENGTH	FULL SCALE CAPACITY	PART NUMBER	MODEL NUMBER	SHIPPING WEIGHT	NUMBER OF MODULES	NUMBER OF LOAD CELLS	"r" FACTOR	CLC (TONS)
10 ft	60 tons	44617	EZ1011-SC-60	5,200 lb	1	4	2.06	35
20 ft	60 tons	44618	EZ2011-SC-60	8,500 lb	1	4	2.06	35
24 ft*	60 tons	44619	EZ2411-SC-60	9,000 lb	1	4	2.06	35
40 ft	60 tons	44620	EZ4011-SC-60	15,300 lb	2	6	2.06	35
47 ft*	60 tons	44621	EZ4711-SC-60	17,300 lb	2	6	2.06	35
60 ft	100 tons	44622	EZ6011-SC-100	22,100 lb	3	8	2.06	35
70 ft	100 tons	44623	EZ7011-SC-100	25,600 lb	3	8	2.06	35
80 ft	100 tons	44624	EZ8011-SC-100	28,900 lb	4	10	2.06	35
93 ft*	100 tons	44625	EZ9311-SC-100	33,900 lb	4	10	2.06	35
100 ft	100 tons	44626	EZ10011-SC-100	35,700 lb	5	12	2.06	35
117 ft*	100 tons	44627	EZ11711-SC-100	42,200 lb	5	12	2.06	35

EZ SERIES – 12 FOOT WIDTH

LENGTH	FULL SCALE CAPACITY	PART NUMBER	MODEL NUMBER	SHIPPING WEIGHT	NUMBER OF MODULES	NUMBER OF LOAD CELLS	"r" FACTOR	CLC (TONS)
10 ft	60 tons	44629	EZ1012-SC-60	5,700 lb	1	4	2.06	35
20 ft	60 tons	44630	EZ2012-SC-60	9,300 lb	1	4	2.06	35
24 ft*	60 tons	44631	EZ2412-SC-60	9,800 lb	1	4	2.06	35
40 ft	60 tons	44632	EZ4012-SC-60	16,700 lb	2	6	2.06	35
47 ft*	60 tons	44633	EZ4712-SC-60	18,900 lb	2	6	2.06	35
60 ft	100 tons	44634	EZ6012-SC-100	24,600 lb	3	8	2.06	35
70 ft	100 tons	44635	EZ7012-SC-100	28,000 lb	3	8	2.06	35
80 ft	100 tons	44636	EZ8012-SC-100	31,500 lb	4	10	2.06	35
93 ft*	100 tons	44637	EZ9312-SC-100	37,100 lb	4	10	2.06	35
100 ft	100 tons	44638	EZ10012-SC-100	38,900 lb	5	12	2.06	35
117 ft*	100 tons	44639	EZ11712-SC-100	46,200 lb	5	12	2.06	35

* 24 ft actual = 23' 4", 47 ft actual = 46' 8", 93 ft actual = 92' 4", 117 ft actual = 116' 8"

Truck Scale Pricing with Options

Truck Scale and Ancillary Items Necessary to Operate/Install Truck Scale

Truck scale	$ _____
Foundation	$ _____
Approaches (10 feet minimum on the same plane as the truck scale)	$ _____
Ramps (specify ratio of drop to run)	$ _____
Concrete for weighbridge deck	$ _____
Rebar and corrugated sheeting for weighbridge deck (SR only)	$ _____
Storage and test of core samples (if appropriate)	$ _____
Excavation and necessary local permits	$ _____
Conduit and trenching from scale to instrumentation	$ _____
Conduit and trenching from scale and options to power access	$ _____
Trenching for ground cable from scale to electric company ground rod	$ _____
Installation, Calibration, and State/Local Certification	$ _____

Indication and Printer Options

5.0 Indicator shall be from same manufacturer as the truck scale. Add $ _____

5.01	IQ plus 310A	5.04	IQ plus 350
5.02	IQ plus 800	5.05	IQ plus 510
5.03	IQ plus 810	5.06	IQ plus 710

5.1 Ticket printer shall be from same manufacturer as the truck scale. Add $ _____

5.11	SP2000	5.12	SP2200

Listing of Possible Truck Scale Options

6.0 Remote displays shall be from same manufacturer as the truck scale. Add $ _____

6.01 Flip digit - 1.5", 4", or 6" sizes

6.02 LCD display - 2" or 3" sizes

6.1 Software for truck scales shall be from same manufacturer as the truck scale. Add $ _____

6.11 Transact/Transact Plus truck management software

6.2 Unattended weighing systems shall be from same manufacturer as the truck scale. Add $ _____

6.21 ATS -1

6.22 ATS -2

6.3 Transient Protection (Lightning Protection) should be from the same vendor as the truck scale. Add $ _____

6.31 Extended lightning protection should be available for up to 5 years after installation date.

Year 2 - Add $ _____
Year 3 - Add $ _____
Year 4 - Add $ _____
Year 5 - Add $ _____

6.4 Stainless steel, hermetically-sealed load cells Add $ _____

6.5 Steel protective posts Add $ _____

6.6 Traffic light package Add $ _____

Vehicle Scale Limited Warranty

Rice Lake Weighing Systems (RLWS) warrants that all RLWS brand equipment and systems properly installed by a Distributor will operate per written specifications as confirmed by the Distributor and accepted by RLWS. All systems and components are warranted against defects in materials and workmanship for one (1) year, unless otherwise stated.

RLWS warrants that the equipment sold hereunder will conform to the current written specifications authorized by RLWS. RLWS warrants the equipment against faulty workmanship and defective materials. If any equipment fails to conform to these warranties, RLWS will, at its option, repair or replace such goods returned within the warranty period subject to the following conditions:

- Upon discovery by Buyer of such non-conformity, RLWS will be given prompt written notice with a detailed explanation of the alleged deficiencies.
- Individual electronic components returned to RLWS for warranty purposes must be packaged to prevent electrostatic discharge (ESD) damage in shipment. Packaging requirements are listed in a publication, “Protecting Your Components From Static Damage in Shipment,” available from RLWS Equipment Return Department.
- Examination of such equipment by RLWS confirms that the non-conformity actually exists, and was not caused by accident, misuse, neglect, alteration, improper installation, improper repair, or improper testing. RLWS shall be the sole judge of all alleged non-conformities.
- Such equipment has not been modified, altered, or changed by any person other than RLWS or its duly authorized repair agents.
- RLWS will have a reasonable time to repair or replace the defective equipment. Buyer is responsible for shipping charges both ways.
- Vehicle scale products are eligible for warranty labor and mileage charges with pre-approval by RLWS Service Department, and only to the limits described in the vehicle scale reimbursement program.
- RLWS will not be liable for the cost of any repairs made by others.

THESE WARRANTIES EXCLUDE ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NEITHER RLWS NOR DISTRIBUTOR WILL, IN ANY EVENT, BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

RLWS AND BUYER AGREE THAT RLWS’ SOLE AND EXCLUSIVE LIABILITY HEREUNDER IS LIMITED TO REPAIR OR REPLACEMENT OF SUCH GOODS. IN ACCEPTING THIS WARRANTY, THE BUYER WAIVES ANY AND ALL OTHER CLAIMS TO WARRANTY.

SHOULD THE SELLER BE OTHER THAN RLWS, THE BUYER AGREES TO LOOK ONLY TO THE SELLER FOR WARRANTY CLAIMS.

No terms, conditions, understanding, or agreements purporting to modify the terms of this warranty shall have any legal effect unless made in writing and signed by a corporate officer of RLWS and the Buyer.

Vehicle Scales Labor and Travel Reimbursement Program

IMPORTANT NOTE: All labor and warranty claims must be authorized by Rice Lake Weighing Systems. A Return Materials Authorization (RMA) number will be required to submit warranty reimbursement claims.

The following chart outlines labor and warranty reimbursement components for vehicle scale warranty support. Warranty claims are for defects in materials and workmanship only. This labor reimbursement program is only available for vehicle scales.

Labor and Mileage Claims under Vehicle Scale Limited Warranty

Labor claims are effective for 90 days after shipment of the vehicle scale from RLWS

Labor (on site):	16 hours maximum on site labor
Labor (travel time):	6 hours maximum travel time, maximum rate $25.00 per hour
Mileage charges:	Test truck – $1.25 per mile, maximum 120 miles Pickup – $0.45 per mile, maximum 120 miles

This reimbursement program only applies to vehicle scale products shipped from RLWS. Ancillary equipment provided by others is the responsibility of others.

Rice Lake Weighing Systems will specify particular components, actions, and material to be used in the installation and completion of a vehicle scale. The provided components must meet the RLWS specifications, or warranty reimbursement may not occur.

Parts Replacement under Vehicle Scale Limited Warranty

Component Parts	100% replacement cost

This reimbursement program only applies to vehicle scale products shipped from RLWS. Ancillary equipment provided by others is the responsibility of others.

Rice Lake Weighing Systems will specify particular components, actions, and material to be used in the installation and completion of a vehicle scale. The provided components must meet RLWS specifications or warranty reimbursement may not occur.

Shipping and Scheduling Guidelines

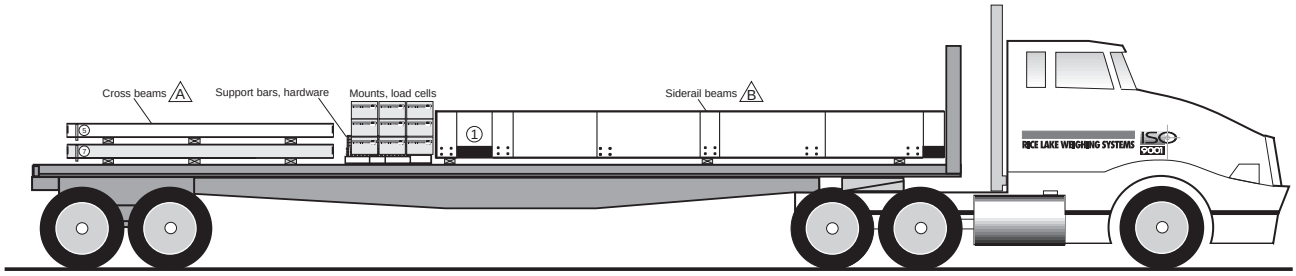
All SURVIVOR truck scales are shipped by common carrier, FOB Rice Lake, Wisconsin.

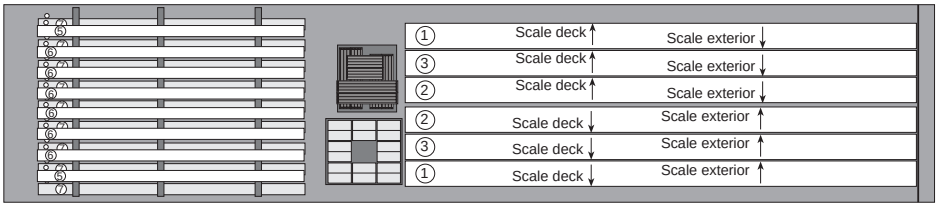
SURVIVOR SR Shipping

All SR scales are shipped as individual components on a regular flat-bed trailer. Normal freight rates apply because no items are wider than normal highway limits. Contact Rice Lake Weighing Systems for an exact shipping price to the intended installation location, or refer to the *Truck and Track Scale Transportation Rate Chart* in the Vehicle Scales Section of the RLWS Master Catalog for estimated costs.

Note that RoughDeck Floor Scales may often be loaded on the same truck and shipped to the same site for no additional shipping fees. Drop charges apply if delivered to a different location.

SR scale components are loaded in the reverse order that they will normally be assembled on site, and a truck loading diagram for the SR scale being shipped is included in the assembly instructions sent with the scale. All components are clearly labeled and keyed to the truck loading diagram and assembly instructions. A sample truck loading diagram for a 14' x 70' single-platform scale is reproduced below.





A Bottom layer –Nine #7 cross beams. Top layer –Two #5 and six #6 cross beams

B Two #1 (23’ 4”) siderails. Two #2 (23’ 4”) siderails. Two #3 (23’ 4”) siderails.

SURVIVOR® Siderail SR-7014-SC-100 Loading Diagram

SURVIVOR EZ Shipping

The 10', 11', and 12' wide fabricated modules of the SURVIVOR EZ flattop scales are shipped as oversize loads. Exact shipping costs can be determined by applying a per-mile multiplier to the normal shipping rates. To estimate shipping costs, refer to the *Truck and Track Scale Transportation Rate Chart* in the Vehicle Scales Section of the RLWS Master Catalog.

Note that RoughDeck Floor Scales may often be loaded on the same truck and shipped to the same site for no additional shipping fees. Drop charges apply if delivered to a different location.

Truck Scale Buyer's Questionnaire

Application Specifics

1. Is the application subject to peak usage (i.e., harvest for an agricultural scale)? ___YES___NO

2. Number of trucks to be weighed per day? _____ Normal _____ Peak

3. Maximum length of vehicles to be weighed? _____ Feet

4. Maximum width of vehicles to be weighed? (Consider overwide cargo) _____ Feet

5. Maximum weight of vehicles to be weighed? (Include potential overloads) _____ LBS

6. Do the vehicles being weighed have any unusual axle-loading characteristics? (For example, a tri-axle that crosses the scale with the middle axle raised) ___YES ___NO

7. Are you buying and selling over the scale? ___YES ___NO

8. How will your operation be impacted by scale downtime? Is it critical to daily (hourly) operations to have a scale operating? ___YES ___NO

Application Summary

Planning for the future is important with truck scales. The SURVIVOR series scales are designed to last for decades, and operations can change in that amount of time. To get the most "bang for the buck," size the scale a little larger whenever your application is near a size or capacity breakline.

As an example, consider tractor-trailer trucks with sleep-over cabs. Total length of those trucks is now approaching, and often exceeding, a typical 70-foot long truck scale. In this case, an 80-foot scale is a better long-term purchase than the more common 70-foot long scale.

Site Selection Specifics

1. Is space adequate for trucks to approach and leave the scale without turning? ___YES ___NO

   A general rule of thumb is to double the length of the scale for a rough idea of space restrictions. Width is more flexible. Cross traffic is NOT possible on an above-ground scale with ramps.

2. Have the State requirements for ramps and foundations been reviewed? ___YES ___NO

   See *State Weights and Measures Directors* in the Appendix for contact names and phone numbers.

3. Are there any local permitting issues with the site selected? Easements? ___YES ___NO

4. Review the flow of truck traffic and its impact on other operations? ___YES ___NO
   Yours? Other private concerns? Government agencies?

5. Is the scale located in a Hazardous Environment classification zone? ___YES ___NO

   If yes, what is the classification? CLASS _____, DIVISION _____, GROUP _____

Site Selection Summary

Each scale site is unique in some fashion. From high water tables, to underground utility lines or low soil-bearing pressure, each potential obstacle can be overcome if it is recognized and handled early in the process. It is critical that the distributor, contractor, and final user work closely together in the site determination process to “fine tune” all specific installation issues before they become significant problems in the future.

Foundation Specifics

1. What is the maximum frost depth expected at the site? _____inches
2. Is there construction access to both sides of the scale site? ___YES ___NO
3. Will the soils beneath the excavated footings support 3000 psf? ___YES ___NO
4. Will normal 34'-long approaches be sufficient to reach surrounding final grade? ___YES ___NO
5. Will significant backfill and landscaping be necessary to attain final grade level? ___YES ___NO
6. Will the scale house be located more than 50' from the scale? ___YES ___NO
7. Will peripheral equipment requiring underground wiring be included? ___YES ___NO

Foundation Summary

A significant portion of the overall cost of a vehicle scale will be concrete and steel located in the ground. The permanence of in-ground concrete makes a misplaced scale site a major financial mistake. Some low-profile truck scales can be relocated after assembly, but excavation and concrete work is wasted if a move is required in the future due to poor planning.

The above checklists for application, site selection, and foundation information will go a long way toward aiding you in your vehicle scale selection process. However, it is not all-inclusive. If questions arise, please contact the factory for additional information.