



## The Bonded Weigh Program



**Weighperson Training Manual**  
March 2010 Edition

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## **I. INTRODUCTION**

This manual is a practical training guide for Bonded Weighpersons, as well as a guidance document for the Virginia Department of Transportation's (VDOT) Bonded Weigh Program. The information included in this manual is compatible with the 2007 Road and Bridge Specifications and the current version of the Materials Division Manual of Instructions.

This manual does not address all situations that a weighperson may encounter in the routine performance of weighing operations. The District Materials Engineer and staff are prepared to assist the weighperson. The Central Office Materials Division is also available to assist the Districts.

## **II. GOALS & OBJECTIVES FOR THE BONDED WEIGH PROGRAM**

VDOT specifies the program objective in Section 109.01 of the Road and Bridge Specifications:

Section 109.01

“The methods of measurement and computations to be used to determine quantities of material furnished and work performed will be those generally recognized as conforming to good engineering practice.”

Section 109.01 (a)

“Materials that are measured or proportioned by weight shall be weighed on accurate scales as specified in this section.”

“When material is paid for on a tonnage basis, personnel performing the weighing shall be certified by the Engineer and shall be bonded to the Commonwealth of Virginia in the amount of \$10,000 for the faithful observance and performance of the duties of the weighperson required herein.”

A complete excerpt of Section 109.01 (a) Measurement by Weight is included as Appendix 1. A complete excerpt of corresponding sections of the Manual of Instructions, Sections 107 Scale Program and 108 Bonded Weighperson Program are included as Appendix 2. Examples of pertinent forms are in Appendix 3. In Appendix 4, there are examples of a legal load determination form and maximum weight limitations and determination charts. While VDOT no longer requires Legal Load determination, this information is kept herein only for guidance to Weighpersons. Appendix 5 defines the terms to clarify the specifications of this program.

## **III. DESCRIPTION OF WEIGHPERSON EVALUATION**

Following are listed particular items that the District Materials Engineer or representative will review during the course of the examination of the weighperson. This list is not all inclusive of the weighperson's duties.

1. The weighperson's ability to properly perform weighing operations is demonstrated by the following:
  - a. Must zero scales and maintain the scale platform in a clean condition during the weekly taring and during shipment to State projects or purchase orders.
  - b. Must maintain a current seal of the Office of Product and Industry Standards, Virginia Department of Agriculture and Consumer Services (OPIS / VDACS) while shipping to the state.
  - c. Must provide for the routine testing of scales by OPIS or an approved scale service company at intervals of no less than six and no more than seven months between inspections.
  - d. Weighperson assists Department's representative in performing checks of scales.
2. Demonstrates ability to tare trucks.
  - a. The truck tare weight is the weight of the empty truck with full tank(s) of fuel and the driver seated in the truck.
  - b. The tare weight is recorded to the nearest 20 pounds.
  - c. For routine taring, the Weighperson shall tare each truck at least once a week during periods of materials shipment to State work.
  - d. At the option of the Producer, a new tare may be determined for each load. The requirement for full tank(s) of fuel will be waived and the most recent tare is used to determine net pay quantity, providing the vehicle has been certified.
3. Demonstrates and/or explains the system the Producer uses to identify lots and maintains accruing data totals.
4. A copy of the Surety Bond shall be posted for compliance with Department specifications.
5. Demonstrates an understanding of the Daily Summary Sheet, Form TL-102A.
  - a. Explains the logistics of delivery of TL-102A's to projects, state personnel or state personnel in case of purchase orders.
  - b. Furnishes a summary to each order and/or contract. Issues a summary for each lot of production shipped to state projects and purchase orders.
  - c. Multiple lots may be reported on the TL-102A at the discretion of the District Materials Engineer.
  - d. It shall be accurate, concise and verified with a signature of the responsible party.
  - e. Delivers them to the person collecting the weigh tickets at the project or work area by the end of the next working day, or according to the agreement with a Department's representative receiving the material.
6. Knows what to do in case of a malfunction.
7. Knows whom to contact (Department representative) in case of problems.

## IV. ALTERNATIVE WEIGHT DETERMINATIONS

**NOTE:** This information pertains to **vessels** only and is an alternative calculation used instead of scales. This section is for **information only**.

### A. Vessel Displacement<sup>1</sup>

Each vessel will be accurately measured and will be fitted with gauges graduated in tenths of a foot. The gauges will be located on each corner of the vessel, near the lower end of the rake, with two additional gauges amidships. Fore and after displacement due to load will not differ more than 10 percent from their mean for the determination of tonnage, except in unavoidable cases. All gauge readings will be made in still water.

At the option of the Contracting Officer, tonnage determinations may be made at the loading point by using change in gauge readings from light marks to load marks, or at the unloading point by using change in gauge readings from load marks to light marks. All vessels shall be pumped dry (within limits of the pump suction) before each gauging, and limbers shall be kept open so that any water in the vessel will flow freely to the pump suction.

The weight of the water displaced at the point of gauging will be based on approved hydrometer readings of the water assuming that water weighing 62.4 pounds per cubic foot has a specific gravity of 0.9975. Each barge shall be calibrated a minimum of one time, and additionally as directed by the Engineer, by measuring the weight of all stone placed on the barge by the producers specified below in the paragraph, "Certified Weight," and comparing the sum of those certified weights with the weight determined by the barge displacement method. Adjust the gauges on the barge as necessary to address any discrepancy in the certified weights and the weights computed by displacement measurements.

### B. Certified Weight

If shipments are made by railroad from the quarry to tidewater and then transferred to barges, certified railroad weights will be accepted in place of weights determined by barge displacements. If shipments are made by truck from the quarry, each truckload of stone shall be weighed on scales, which have been carefully verified by a properly accredited official. One original report and duplicate copy of weight of each carload or truckload, certified by the weighperson and prepared in ink or indelible pencil, shall be furnished to the Engineer. The report shall show gross, tare, and net weight of each carloads or truckload.

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<sup>1</sup> "Vessel Displacement," United States Army Corps of Engineers, Navigation. Section 01800:5.7.1.

**Appendix 1**  
**VDOT Road and Bridge Specifications**  
**Section 109.01 (a) Measurement by Weight**

- (a) **Measurement by Weight:** Materials that are measured or proportioned by weight shall be weighted on accurate scales as specified in this Section. When material is paid for on a tonnage basis, personnel performing the weighing shall be certified by the Department and shall be bonded to the Commonwealth of Virginia in the amount of \$10,000 for the faithful observance and performance of the duties of the weighperson required herein. The bond shall be executed on a form having the exact wording as the Weighpersons Surety Bond Form furnished by the Department and shall be submitted to the Department prior to the furnishing of the tonnage material. ~~No payment will be made for materials delivered in excess of the legal load limits established for each truck.~~

The Contractor shall have the weighperson perform the following:

- ~~1. Post and furnish a weekly tare weight of each truck used and keep a record of them for 12 months.~~
2. Furnish a signed weigh ticket for each load that shows the date, ~~truck number~~, load number, plant name, size and type of material, project number, schedule or purchase order number, and the weights specified herein.
3. Maintain sufficient documentation so that the accumulative tonnage and distribution of each lot of material, by contract, can be readily identified.
4. Submit by the end of the next working day a summary of the number of loads and total weights for each type of material by contract.

~~Trucks used to haul material being paid for by weight shall display the truck uniform identification number and legal gross and legal net weight limits. These markings shall be no less than 2 inches high and permanently stenciled on each side of the truck with contrasting color and located as to be clearly visible when the vehicle is positioned on the scales and observed from normal position of the weighperson at the scale house.~~

Trucks used to haul material shall be equipped with a cover suitable to protect the material and to protect the traveling public.

The truck tare to be used in the weighing operation shall be the weight of the empty truck determined with full tank(s) of fuel and the operator seated in the cab. The tare weight of trucks shall be recorded to the nearest 20 pounds. At the option of the Contractor, a new tare may be determined for each load. When a new tare is obtained for each load, the requirement for full tank(s) of fuel will be waived.

Net rail shipment weights may be used for pay quantities when evidenced by railroad bills of lading. However, such weights will not be accepted for pay quantities of materials that subsequently pass through a stationary mixing plant.

Scales shall conform to the requirements for accuracy and sensitivity as set forth in the National Institute of Standards and Technology Handbook No. 44 for Specification Tolerances and Requirements for Commercial and Weighing Devices. Scales used in the weighing of materials paid for on a tonnage basis shall be approved and sealed in accordance with the requirements of the policies of the Bureau of Weights and Measures of the Department of Agriculture and Consumer Services, or other approved agencies, at least once every six months and upon being moved. Hopper and truck scales shall be serviced and tested by a scale service representative at least once every six months. Hopper scales shall be checked with a minimum 500 pounds of test weights and truck scales shall be checked with a minimum 20,000 pounds of test weights.

Copies of scale test reports shall be maintained on file at the scale location for at least 18 months, and copies of all scale service representative test reports shall be forwarded to the Department.

The quantity of materials paid for on a tonnage basis shall be determined on scales equipped with an automatic printer. Truck scale printers shall print the net weight and either the gross or tare weight of each load. Hopper scale printers shall print the net weight of each load. The weigh ticket shall also show the legal gross weight for material weighed on truck scales and the legal net weight for material weighed on hopper scales.

If the automatic printer becomes inoperative, the weighing operation may continue for 48 hours provided satisfactory visual certification of weights can be made. The written permission of the District Materials Engineer shall be required for the operation of scales after 48 hours.

If significant discrepancies are discovered in the printed weight, the ultimate weight for payment will be calculated on volume measurements of the materials in place and unit weights determined by the Engineer or by other methods deemed appropriate to protect the interests of the Commonwealth.

**Appendix 2**  
**VDOT Materials Division**  
**Manual of Instructions**  
**Excerpted Sections 107 and 108**

**107 SCALE PROGRAM**

Truck and hopper scales used in weighing material for Department work are to be certified and sealed, as outlined in the Road and Bridge Specifications. Batch test weights are also included in this policy. The District Materials Engineer, in whose area the plant is located, will be responsible for initiating these instructions.

**Sec. 107.01 Certification of Batch Test Weights**

The 10 fifty-pound (225 kilogram) batch test weights are to be calibrated and certified, as outlined in the Road and Bridge Specifications.

Test weights having drilled or formed holes, other than the adjustment cavity on the sidewall, are not acceptable. The likelihood of dirt, cement, asphalt, or other foreign material accumulating in the holes makes this type of test weight unsatisfactory for plant use.

Test weights, in order to be certified, must conform to Weights and Measures' requirements for a Class C test weight. Such weights must have a sealing cavity for calibration, and the cavity must be of such design that its opening can be readily capped and sealed. Additional information is available upon request from Weights and Measures concerning sources where acceptable test weights may be purchased.

**Sec. 107.02 Certification of Scales**

(a) The following instructions will cover all situations requiring the sealing of scales, but will not be limited necessarily to the following situations:

- (1) When plants and scales are initially set up.
- (2) When scales are moved from one location to another.
- (3) When there has been more than seven months since the last inspection by the Office of Product and Industry Standards (OPIS) / Virginia Department of Agriculture and Consumer Services (VDACS) or an approved private scale service company.
- (4) When scales are suspected or determined to be out of tolerance or adjustment at anytime during operation, regardless of when previously sealed.

(b) The following procedures should be used in obtaining compliance with scale certification requirements:

- (1) The Scale Owner, whether it be the Material Producer, Supplier or Contractor, shall determine the date on which the scale will be needed. Should inspection and sealing of the scales be required under any of the four above noted conditions, then the Scale Owner shall contact a scale service company licensed by (OPIS) / (VDACS). The scales are required to be inspected twice per year. A producer may use an OPIS/VDACS inspection as one of the required inspections however it is the producer's responsibility to obtain the service of a private scale company when OPIS resources are not available. There shall be no less than six to no more than seven months between inspections to assure the scales are in compliance with specifications. Scales that have not been inspected within the time frames requested without a substantial reason can be

considered to be out of tolerance, therefore no more materials will be purchased without review.

- (2) The scale manufacturer's representative or repairman will have a definite Scale Technician Service and Test Report that has been established or approved by Weights and Measures, to follow when checking the scales.
- (3) One copy each of the Scale Technician Service and Test Report, when properly filled out by the scale repairman, shall be given to the scale Owner and Weights and Measures. The scale Owner shall be responsible to see that the District Materials Engineer receives the copy so designated. This must be signed by the person inspecting the scale, and must indicate whether the scale is satisfactory or unsatisfactory for use, in accordance with the requirements of National Institute of Standards and Technology, Handbook 44, corrected through the current year. The scale Owner's copy of the report is to be posted in the scale house or in the office close to the scales, where it is readily available to anyone desiring to refer to it.
- (4) Scales shall not be placed in, or returned to, service by a scale repairman, unless it meets all requirements of National Institute of Standards and Technology, Handbook 44, outlined in Item 3 above (also see Item 6). When scales have been "tagged" rejected or condemned by Weights and Measures, only they can remove the tag and return scales to service.
- (5) Scale repairmen must have and use at least 500 lbs. (225 kg) of test weights on hopper type scales and at least 20,000 lbs. (9050 kg) of test weights on motor truck scales. Strain load tests shall be conducted when scale capacity exceeds the test weights used.

It is the intent that the 20,000 lbs. (9050 kg) of test weights used on motor truck scales be transported on a single truck, whose vehicle weight combined with the test weights will approach the range of loads being weighed on the scales.

The sections of the vehicle scales should be checked at increments up to and including 20,000 lbs. (9050 kg) using the test weights. Next, the sections should be checked with the test weight transport vehicle and a load of 20,000 lbs. (9050 kg) of test weights. In the event the combined weight of transport vehicle and test weights is less than 44,000 lbs. (19,950 kg), an empty or partially loaded truck which weighs approximately the same as the combined weight of the transport vehicle and test weights is to be weighed and test weights added to the scale platform to bring the total load to 44,000 lbs. (19,950 kg) or greater.

District Materials representatives should review scale service reports and/or occasionally observe a 6 month service check to assure themselves that 20,000 lbs. (9050 kg) of test weights are being used, that sections of the scale are being checked both with 20,000 lbs. (9050 kg) of test weights and with the combined weight of the transport vehicle and 20,000 lbs. (9050 kg) of test weights, and that a gross platform load of 44,000 lbs. (19,950 kg) or greater is being used.

- (6) If Weight and Measures can test and approve the scale prior to date of use or date of seal expiration, ignore the remainder of Items 6 and 7, and proceed to Item 8 for further instructions.

If Weights and Measures cannot test and approve the scales prior to the date of seal expiration, or the anticipated date of use of new or newly relocated scales, the District Materials Engineer may issue temporary approval for use of scales. In making this approval, the District Materials Engineer shall determine whether a conscientious effort

was made by the scale owner to obtain the services of Weights and Measures prior to expiration of seal or date of use.

For temporary scale approval to be issued, the following actions must occur:

- a. The scale owner shall request by letter to the District Materials Engineer for an extension of time.
- b. The scale owner shall provide a signed Scale Technician Service and Test Report, indicating that the scale meets the requirements of Handbook 44. The inspection should have been performed within the last thirty (30) days.
- c. The District Materials Engineer shall notify the scale owner in writing of temporary approval.

The scale must be inspected and sealed by Weights and Measures as soon as possible if the scale owner expects to continue using the scale.

- (7) If the report indicates that the scale does not meet the requirements of Handbook 44, the District Materials Engineer will immediately notify the scale Owner by phone, and confirm by letter, that the scale has been taken out of service for Department work, until it has been properly repaired by the appropriate repairman and approved by Weights and Measures.
- (8) Weights and Measures will give appropriate advance notice as to when they will check the scales. It is suggested that the scale Owner have the scale repairman who serviced the scale present at the specified time, to correct any minor deficiency immediately while the Weights and Measures official is present. The Weights and Measures official will not wait until major repairs are made, or if minor repairs require an unreasonable length of time to accomplish. The scale Owner will be responsible to see that the District Materials Engineer receives a copy of the Scale Inspection Report issued by Weights and Measures.
- (9) If the inspection by Weights and Measures reveals that the scales are not functioning properly and if the necessary repairs or adjustments cannot be made by the scale repairman immediately, the District Materials Engineer will then notify the scale Owner by phone, and confirm by letter, that the scales have been taken out of service for State work until properly repaired and then sealed by Weights and Measures. No additional temporary approval will be given.
- (10) Copies of all correspondence and reports outlined in Items 6, 7, 8, and 9 above will be sent to, or retained by, the State Materials Engineer, Administrative Services Officer, and District Materials Engineer. In cases which involve a contractual dispute, copies of all correspondence and reports noted in Items 6, 7, 8 and 9 will also be sent to the Construction Engineer and Residency Administrator involved.

### **Sec. 107.03 Deleted**

### **Sec. 107.04 General Scale Requirements and Check Points**

The following is some helpful information regarding scale accuracy:

#### **(a) Single Draft Weighing**

The length of a vehicle scale must be adequate to accommodate in its entirety the longest vehicle or vehicle combination. The total weight of a vehicle or combination is not to be determined by adding together the results obtained by separately and not simultaneously weighing each end of such vehicle or individual elements of such couple combination.

The weight of a couple combinations may be determined by uncoupling the various elements (tractor, trailer), weighing each unit separately as a single draft, and adding together the results.

**(b) Scale Platform**

The scale platform should be of adequate strength. The surface should be reasonably smooth and in surface alignment with the pit coping. The opening between platform and coping should be approximately 25 mm, to prevent lodging of foreign matter between platform and pit wall. The surface should be kept in good repair, and cleaned when necessary or at least once a day.

**(c) Scale Pit**

The pit wall, floors, and piers for lever stands should be of good quality concrete. It is imperative that there be periodic cleaning, good pit drainage, and ventilation. Adequate room should be provided so that the inspector or repairman can move about the pit freely. The pit should be deep enough, and access thereto should be such, as to facilitate inspection, cleaning, and maintenance of scale parts.

**(d) Elements in Pit**

All stands should be set on concrete and securely anchored. All elements should be in alignment and level if so designed, with adequate clearance around live parts. Pivots and bearings of the main and extension levers should be well packed with grease to protect the parts against corrosion. All elements, levers, and structural steel should be painted periodically to minimize rust hazards. The weighbridge should be of steel, adequately strong to prevent deflection.

**(e) Indicating Elements**

Indicating elements should be rigidly mounted upon firm foundation, independent of the scale house, weighing room, or other similar structure. Adequate clearance must be provided around the indicating elements and the connections. On beam type truck scales, all connections not above the beam stand must be enclosed. Keep weighbeam bars and face plates in clean and legible condition. Keep automatic elements clean and the dash pot properly filled with oil. See that the poises on the notched weighbeams have pawls that fit the weighbeam notches, and that the spring-loaded weighbeam poises are strong enough to seat the pawl properly in the weighbeam notches. See that the poises on the weighbeam, tare bar, frictional bar, and tare bar on automatic - indicating scales, when they are pushed as far as they will slide in the zero direction of the weighbeam, give a correct (zero) indication. Any loose material used for the purpose of balancing the weighbeam must be secured so that it cannot shift or be knocked off, thus affecting the balance condition of the scale. See that the weighbeam is centered in the fulcrum stand bearing and pivots in loops, and that, when weighbeam is correctly balanced in center of trig loop, the amount equal to two (2) minimum graduations on the weighbeam will hold the weighbeam to the top or bottom of the trig loop. See that the operations of application and removal of unit weights are positive, and that the value of the unit weights in place at any time is clearly indicated on the reading face of the dial.

**(f) Correct Balance**

Keep the beam scale-weighbeam tip in center of trig loop with all poises at zero. The automatic scale indicator on dial face must be pointing to zero, and the printer dial reading must indicate zero. Zero balance should be checked after each five (5) drafts or more often if conditions tend to change the weight of the platform.

**(g) General**

A scale is not to be used for weighing a load totaling more than the capacity indicated on the scale by the manufacturer. Weighmasters must have an unobstructed view of the entire scale platform. The indicating elements, the lever system, and the underside of the load receiving elements of a scale shall be adequately protected against wind and weather effects.

**(h) Temporary Test on Truck Scales**

Acquire correct (zero) balance, place loaded truck on scale platform with rear wheels about .25 m from the end of platform, obtain correct amount, and record. Place truck on other end of platform in same manner and repeat the operation. Both ends should be within 2 lbs. (1 kg) per 1000 lbs. (500kg) of gross load of truck.

**(i) Temporary Test on Hopper Scales**

Acquire correct (zero) balance, making sure that all live parts of the scale are free from a binding condition. Distribute test weights on hopper and record amount indicated. This amount should be within 2 of the minimum graduations on the indicating element. On hopper scales, consideration should be given to suitability of position of the indicating elements, freedom from vibrations, disturbing air currents, and easy accessibility to facilitate daily cleaning of live elements of the scale.

**(j) Documentation of Scale Checks**

When District Materials personnel make a routine accuracy check of plant truck and hopper scales, the scale inspection should be documented showing the date of the inspection and whether or not the scales appeared to be accurate. If any inaccuracies in scales are evident, the particular details of the discrepancy should also be noted. The procedure for checking a set of truck scales begins with a quick visual inspection of the scales to see that material is not jammed into the areas around the platform or below the scales which would affect the weights. The readout unit is to be inspected for a proper “zero” and, if digital, that the readout unit has a seal on it to prevent tampering with adjustments inside.

**Sec. 107.05 Recordkeeping and Scale Certification Data System**

The Department has agreed to the following initiatives which are intended to assist Weights and Measures in providing their service to suppliers of VDOT. In addition, this system is a means of standardizing recordkeeping for the Bonded Weigh Program as a whole.

VDOT employees are not to contact representatives of Weights and Measures to request the sealing of scale. Requests must originate with a producer billing procedure. However, District Materials representatives are encouraged to develop a good working relationship with the regional VDACS inspectors responsible for his/her respective producer scales.

The Central Office of Weights and Measures should be contacted by our producers to request the scheduling of the scale sealing operation.

Each District is to furnish Weights and Measures inspectors in their region a list of in-state producers and the status of the service/sealing activity for the scales involved. The "Agriculture Report" (See Appendix No. I-B is an extracted report from the "Certified Scale Status Report" data base for the District. This report is to be issued at least once each 6 months and quarterly if practicable. District Materials representatives are to remind aggregate and hot mix suppliers of upcoming expiration of Weights and Measures certification. This courtesy reminder is to be given at least 4 to 6 weeks prior to the expiration date.

## **SECTION 108 BONDED WEIGHPERSON PROGRAM**

The Department requires Contractors and Producers who furnish material by weight to have a certified and bonded Weighperson perform the weighing operations for such material furnished for State work. The District Materials Engineer is responsible for monitoring the Bonded Weighperson program.

### **Sec. 108.01 Surety Bond**

The Weighperson's Surety Bond shall be issued in the name of the Producer's firm, rather than in the name(s) of the Weighperson(s). The Weighperson or other company representative shall see that the original copy of the surety bond is submitted to the District Materials Engineer, in whose District the shipping source is located, who will, following review and approval, make appropriate distribution. The Weighperson will be expected to post his/her Bond at the work area for ready reference of the District Materials representative. (See Sec. 800 for a sample Surety Bond.)

### **Sec. 108.02 Certification of Weighperson**

The District Materials Engineer or representative will meet with each proposed Weighperson to verify that the person is bonded, and understands and has the ability to follow VDOT specifications. The evaluation will be made on the basis of an oral evaluation utilizing the standardized questionnaire provided by the Central Materials Office:

#### **(a) The Weighperson Evaluation Form**

This form is not intended to be used as a numerically graded examination of the candidate. District Materials representative will provide each candidate a copy of the Weighperson Training Manual from which the questions are based. The candidates are to be allotted an appropriate amount of time to review and study this information prior to being orally quizzed on the material. If a candidate has problems recalling the answers to the questions, the District Materials representative should prompt or coach the candidate to a reasonable extent. However, if in the opinion of the representative, the candidate needs more study time to better prepare for the evaluation, an additional amount of time may be allowed before retesting. Upon successful completion of the Weighperson Evaluation, the District representative shall recommend the issuing of a Weighperson Certificate by the District Materials Engineer. The signed Weighperson Evaluation Form will serve as a record and documentation of qualifications. The weighperson will be evaluated at the weighing facility at where he/she is employed and evaluated in accordance with the requirement for the equipment he/she will be utilizing in the weighing process.

VDOT suggests the number of employees certified at an individual facility be limited to one (1) full time weighperson with one or two (2) persons serving as backup. The number may vary according to conditions that may occur in high production facilities. However, the number of active weighpersons should be kept in line with the production demands of a facility.

By limiting the number of employees VDOT certifies, VDOT can exercise more control over the Bonded Weigh Program and the amount of monitoring required at each facility. In addition, it is not good practice to encourage the producer to have numerous people certified who are not actively participating in the weighing operation. This effort would tend to protect the producer as well as the State by encouraging reliance on persons who are more thoroughly versed and familiar with the weighing process.

For each certification issued by the District, there shall be a corresponding Weighperson Evaluation Form on file in the District Office for the individual.

The Department reserves the right to withdraw the certification of a Weighperson at any time during the term of the certificate if the performance of duties is not deemed satisfactory.

Upon satisfactorily demonstrating that ability, the Weighperson will be certified by the District Materials Engineer. A copy of the Weighperson's certification also shall be posted for ready reference of the District Materials representative. (See Sec. 800 for details of a sample Certification.) This certification will remain in effect as long as the Weighperson is actively participating in the weighing operation (does not exceed a period of 120 days without actually performing the weighing operation). The Producer is to notify the District Materials Engineer in the event a weighperson is used who has not performed the weighing operation within 120 days.

Following are listed particular items that will be reviewed by the District Materials Engineer or representative during the course of the examination of the Weighperson:

- (1) Demonstrates ability to properly perform weighing operations.
- (2) Demonstrates ability to prepare tare weights.
- (3) Demonstrates and/or explains the system the Producer uses to identify lots and keep up with the running totals.
- (4) Demonstrates an understanding of the Daily Summary Sheet, Form TL-102A. Explains how the sheets will be delivered to the projects, orders, etc.
- (5) Has posted a copy of Surety Bond.
- (6) Knows what to do in case of a malfunction.
- (7) Knows who to contact in the VDOT in case of problems.

### **Sec. 108.03 General Guidelines for Weighperson**

Following are general guidelines for Weighpersons:

- (1) See that trucks are properly tared and in compliance with specifications and instructions.
- (2) Assure that all weights are true and correct.
- (3) Post Certification, Surety Bond, and a current Virginia Weights and Measures Scale Inspection Report. (See Sections 108.01, 108.02 and 107.02.)
- (4) Maintain accumulative tonnage for lots and (IAS) Q.A. sampling.
- (5) Submit Daily Summary Sheet, Form TL-102A, in accordance with specification requirements. (See Sections 108.04 and 800.)
- (6) Provide information to the Department's (IAS) Q.A. Monitor and assist with spot-checks.

- (7) Comply with all pertinent specifications and instructions.

#### **Sec. 108.04 Duties of Certified (Bonded) Weighperson**

Following are specific duties of Weighpersons performing weighing operations for material shipped to State work:

##### **(a) Scale Operation**

- (1) Must be zeroed and platform clean before weekly taring, and must remain so while material is hauled to State projects or purchase orders.
- (2) Must have current seal of Virginia Department of Agriculture and Consumer Services, Bureau of Weights and Measures. Must also have been tested within the last 6 months. (See Section 107.02)
- (3) In case of scale malfunction, notify the District Materials Engineer or his/her representative.
- (4) Weighperson is to assist VDOT representative in performing checks of scales.

##### **(b) Taring Trucks**

- (1) The truck tare weight to be used in the weighing operation will be the weight of the empty truck with full tank(s) of fuel and the driver seated in the truck. The tare weight is to be recorded to the nearest 20 pounds (10 kg).
- (2) For routine taring, the Weighperson shall tare each truck at least once a week during periods of materials shipment to State work. At the option of the Contractor, a new tare may be determined for each load. In that case, the requirement for full tank(s) of fuel will be waived and the most recent tare is to be used to determine net pay quantity.

##### **(c) Weigh Ticket Information**

- (1) Weigh ticket is to accompany each load and is to include plant (company) name and location, date, load number, size and type of material, project, schedule, or purchase order number, and lot number and/or aggregate certification when applicable.
- (2) For truck scales, tickets must include 2 printed weights, one of which must be the NET WEIGHT. For hopper scales, tickets must include the printed NET WEIGHT.
- (3) Weighperson's signature (either handwritten signature, handwritten initials, or computer printout of name or initials) certifies that the truck has been properly weighed and that weights are correct. Tickets are not to be presigned.
- (4) Tickets are to be checked for proper weights and completeness of information.

##### **(d) Daily Summary Sheet (Form TL-102A)**

- (1) Weighperson is to furnish a Daily Summary Sheet (Form TL-102A) to each order and/or contract. One TL-102A will be issued for each lot of production shipped to the state projects and purchase orders. (Multiple lots may be reported on the TL-102A if directed by the District Materials Engineer. The summary sheet is to contain all pertinent information, and is to be delivered to the person receiving the weigh tickets at the project or work area by the end of the next working day, or in accordance with the agreement made with the Department's representative receiving the material. The Daily Summary Sheet may be handwritten and delivered in person or electronically generated and e-mailed for acceptance of materials being shipped. (See additional details in Section 108.05.) (See Sec. 800 for sample Form TL-102A)

**Sec. 108.05 Reconciling Weigh Documents**

The person receiving the Daily Summary Sheet (Form TL-102A) shall reconcile it against the weigh tickets received at destination. If there are differences, they should be corrected or explained. The Producer or Contractor shall be notified of any differences between the quantities shown on the Daily Summary and the weigh tickets.

The Daily Summary Sheet shall be turned in at the completion of a project to the District Location & Design Section, who will check it against the final estimate and the weigh tickets. Upon completing the final estimate, the Daily Summary Sheet shall be retained in the project files, in accordance with published retention schedules. For H - Orders, the Daily Summary Sheets will be sent to the State Materials Engineer after final checks by the Residency Administrator's office.

**Sec. 108.06 Department Monitoring**

The Department will monitor the certified Weighpersons and plants furnishing materials by weight on a continuing basis, with a minimum of one (1) inspection per calendar quarter per plant, or more often if needed. Where significant discrepancies are found, follow-up inspections and reports should be made within 30 days of the original inspection. Where found, discrepancies shall be corrected immediately by the Weighperson, before allowing hauling to resume. The "Weighing Inspection Report" (Appendix No. I-A) shall be retained in the District for documentation with a copy going to the State Materials Engineer. In addition, the District Materials representative shall instruct the Producer to notify him/her when a less experienced temporary Weighperson is going to be used. This will give the District Materials representative an opportunity to visit the plant and review weighing and documentation procedures with the temporary Weighperson prior to weighing operations.

The District Materials Engineer, through the District Materials representative, will be responsible for conducting the weigh inspections. Following are listed items that are to be inspected or reviewed during the District Materials representative's visits:

- (1) Check scales, printer system, and weighing operations.
- (2) Check Weighpersons for knowledge of applicable specifications.
- (3) Check delivery tickets for proper weights and information, including tare weights and lot numbers.
- (4) Check on posted certifications, and bonds. (Dates, frequency, etc.)
- (5) Check scale seals (proper dates) and Weighperson's Surety Bond.
- (6) Check to see if Summary Sheets (Form TL-102A) are being handled properly. (See also Section 108.04 and 108.05.)
- (7) Keep a diary or file on each Supplier, to include dates checked, copy of bond, corrections required, copy of certification, and instructions given, etc.

It is recommended that VDOT trucks continue to use E.D. number as truck I.D. number.

## **Appendix 3**

**Weighing Inspection Report**

**Example Weigh Ticket**

**Example Scales Report**

**Example Scale Inspection Report**

**Weighperson's Evaluation Form**

**Weighperson Certificate of Qualification**

**TL – 102A – Weighperson's Daily Summary Sheet**

**TL-103 – Weighperson's Surety Bond**

***Weighing Inspection Report***

Date of Inspection\_\_\_\_\_

Producer\_\_\_\_\_

Location\_\_\_\_\_

Type Material Produced\_\_\_\_\_

**I. Surety Bond:**

Yes      \*No      N/A

- A. Issued in Compliance with Specifications
- B. Properly Posted
- C. Is Date Current


**II. WeighPerson:**

Name\_\_\_\_\_

(Scale Operator)

- A. This Person Certified
- B. Certification Current
- C. Copy of Certification Available


**III. Weigh Tickets:**

- A. Furnished for Each Load
- B. Contain Job Identifier
- C. Denote Size and/or Type of Material
- D. Contain *Net* Weight
- E. Contain Tare and/or Gross Weight


F. Certification Signed

\*\* G. Contain Signature

\*\* Computer Printout of Name or Initials, Handwritten Signature. or Handwritten Initials are Acceptable.

IV. Plant Records:

A. Tare Information:

Yes \*No N/A

1. Tare Performed at Proper Frequency

--	--	--

2. Date of Posted Tare List Current

--	--	--

3. Tare Weight Properly Computed

--	--	--

4. Tare on Ticket Agrees with current tare Tare List (\_\_\_\_\_Tickets Checked)

--	--	--

B. Weighperson's Daily Summary Sheet (Form TL-102A):

1. Contains All Pertinent Information

--	--	--

2. Is Delivered in Accordance with Specifications

--	--	--

3. Is Noted As Q.A. Tested

--	--	--

C. Running Totals:

1. Are Running Totals Kept

--	--	--

2. Is Method Timely and Accurate

--	--	--

3. Does System Provide for Lot and Sample Identification

--	--	--

V. Hauling Equipment:

A. Body Clean

--	--	--

VI. Scales:

Yes      \*No      N/A

- A.      Currently Sealed
- B.      Automatic Printer System Operative
- C.      Platform Clean
- D.      Printer Indicates "0" Under No-Load Condition
- E.      Temporary Scale Check Within Tolerance

Yes	*No	N/A

VII. Remarks:

---

---

---

---

\*"No" Answers Must Be Explained To Include Action(s) Taken.

Signed \_\_\_\_\_  
(Department Materials Representative)

Signed \_\_\_\_\_  
(Weighperson)

**ROCK OF GIBRALTAR QUARRIES, INC.** **TICKET** **NO.**  
**09754385**

**Pamplin City Quarry**  
**P.O. Box 91101**  
**Pamplin City, Virginia 12345-6789**  
**Phone: (804) 679-3361**

**SOLD TO: RAYSHAWN CONTRACTOR CO.**  
**SHIP TO: RAYSHAWN CONTRACTOR CO.**

**FRI ORDER: 2108**  
**PURCHASE**

**ORDER NO.:**

**PROJECT: 0460 06F 10 C501 C502**

**CONTRACT:**

**PRODUCT: NO. 21B PUGMILL (251)**

**RELEASE:**

**GROSS: 6050 LBS. 28138 KG. LOT NO.: 24**  
**TARE: 26740 LBS. 12129 KG. TOTAL LOADS TODAY: 21**  
**DATE: 01/25/02**  
**NET. WGT: 17.63 TONS 15.99 MG. SHIPPED TODAY: 139.98**  
**TIME: 3:05 PM**

**QUANTITY ORDERED:**  
**BALANCE ON ORDER: SCALE:**

**NO. 1**

**CERTIFIED WEIGHER: JASHUA SEAY**

<b>Driver's Signature:</b>	<b>Customer Signature:</b>
	<i>Martin Jameson</i>

**CARRIER: FRANKLIN PEARSON** **TRUCK NO: 3067**

**COMMENTS:** Go east on right 460 and make left turn at Hayes Road. The project is approximately 2.5 miles north of this intersection.

**ALL MATERIAL TESTED IN ACCORDANCE WITH VDOT SPECIFICATIONS.**

**LGW: 67500** **HAUL RATE: \$2.25**



# COMMONWEALTH of VIRGINIA

## DEPARTMENT OF TRANSPORTATION

1401 EAST BROAD STREET  
RICHMOND, VA 23219-2000

**PHILIP A. SHUCET**  
COMMISSIONER

**ANDREW J. MERGENMEIER, P.E.**  
STATE MATERIALS ENGINEER

July 1, 2003

### Virginia Weights and Measures Association

G. Weston Diggs, Secretary/Treasurer  
P. O. Box 1163, Room 402  
Richmond, VA 23218-1163  
804/786-2476, Fax: 804/786-1571  
[gdiggs@vdacs.state.va.us](mailto:gdiggs@vdacs.state.va.us) <<mailto:gdiggs@vdacs.state.va.us>>

Dear Mr. Weston Diggs,

The following is a list of producers currently supplying materials to VDOT, in Staunton District.

<u>Aggregate Quarries</u>	<u>Type</u>	<u>Scale Locations</u>
C.W. Barger	P	Lexington
Brett Aggregate	P	Stuarts Draft
Staunton Lime	P	Staunton
Transit Mixed Concrete	P	Staunton
Vulcan Materials	P	Lowmoor
Frazier (North) (Out B)	P	Harrisonburg
Frazier (Harrisonburg (Lg.))	P	Harrisonburg
Frazier (Thorndale)	P	Forestville
Global Stone Winchester (Freys) (#1)	P	Clearbrook

<u>Asphalt Plants</u>	<u>Type</u>	<u>Scale Locations</u>
Adams Const.	P	Lowmoor
Adams Const.	H	Lexington
B & S Contr. (Augusta)	H & P	Staunton
B & S Contr. (Staunton)	H & P	Staunton
Moffett Paving	H & P	Staunton
Shenandoah Asphalt	P	Vesuvius

Types of Scales P = Platform  
H = Hopper

Sincerely,

David C. Morris  
District Materials Engineer

Telephone: 804/786-2476

VIRGINIA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES  
OFFICE OF PRODUCT AND INDUSTRY STANDARDS  
P.O. BOX 1163, ROOM 402  
RICHMOND, VIRGINIA 23218

VDOT

VEHICLE SCALE INSPECTION REPORT

Name Associated Asphalt Test No. SP1 EST. # \_\_\_\_\_  
 Address P.O. Box 12676 Roanoke 24027 Manager Tim Shelton  
 Location/Directions Roanoke Ave. off Bridge St. City Roanoke County \_\_\_\_\_  
 Phone No. 345-8865

SCALE		INDICATORS			INSTALLATION CONDITION				
Make of Scale <u>Weigh Tronix</u>	Dial	Balance Ind.			Y	N		Y	N
Serial Number <u>000700/06</u>	T R Beam	Display		Pit Clean		X	Ind's Secure		Y
Scale Capacity <u>12000</u>	Computer	Digital Ind.	X	Pit Dry		X	Poise Seating		Y
Section Capacity/CLC <u>25 ton</u>	Printer	Other		Sump Pump		X	Notches Clean		Y
Min. Graduation <u>20 lb</u>	Dial Capacity	Seal ID (As Found)		Deck Free	X		Bal. Ball Rotable		Y
Platform Size <u>60x10</u>				Deck Clean	X		Printer Legible	X	Y
Commodities Weighed <u>Asphalt</u>				Deck Solid	X		Approach Level	X	Y

TEST RESULTS

Bal. Found 0 SR-Zero Load Drift Lbs. SR-Full Load \_\_\_\_\_ Lbs. Bal. Shift During Test 0 Lbs.

Load Position	Test Wts.	Error	Load Position	Test Wts.	Error	Load Position	Test Wts.	Error
<u>See 1</u>	<u>9000</u>	<u>0</u>	<u>See 2</u>	<u>24000</u>	<u>0</u>	Tare Beam		
	<u>17000</u>	<u>0</u>				Tare Beam		
	<u>27000</u>	<u>0</u>	<u>3</u>	<u>✓</u>	<u>0</u>	Unit Wts.		
			<u>4</u>	<u>✓</u>	<u>0</u>	Unit Wts.		

SUBSTITUTION OR STRAIN-LOAD TEST

Load Position	Indicated Tare Weight	Test Weights	Indicated Gross Weight	Error
<u>See 1</u>	<u>30960</u>	<u>24000</u>	<u>54960</u>	<u>0</u>
<u>2</u>	<u>30960</u>	<u>✓</u>	<u>54960</u>	<u>-20</u>
<u>3</u>	<u>30960</u>		<u>54940</u>	<u>-20</u>
<u>4</u>	<u>30960</u>		<u>54960</u>	<u>0</u>

ACTION TAKEN

- CORRECT Acceptable for Commercial Use
- REJECTED FOR REPAIRS Make Necessary Repair or Replacement by \_\_\_\_\_ or Scale Will be Removed From Commercial Use.
- CONDEMNED Restricted From Commercial Use Until Repaired
- CONDEMNED Restricted From Commercial Use Until Approved by Virginia Weights and Measures



Receipt of Report Acknowledged

Tim Shelton

Inspector

J.B. Booth

Date

6-25-01

A SCALE MUST BE MAINTAINED IN BALANCE AT ALL TIME (VA WEIGHTS & MEASURES LAW)  
A SCALE MUST NOT BE USED FOR WEIGHING LOADS GREATER THAN THE NOMINAL CAPACITY OF THE SCALE  
NO - SPLIT - LOAD WEIGHING ALLOWED (VA WEIGHTS & MEASURES LAW)

**Example**

**WEIGHPERSON'S EVALUATION FORM**

In evaluating the knowledge of proposed weighpersons, the following questions are to be used as a standard in judging applicants who are interviewed. The answers and further discussion of these topics can be found in the Training Manual.

1. What are the responsibilities of a bonded weighperson?
2. What weighing checks of scales must be made prior to weighing and shipping material to state projects?
  - 2a. What agency is responsible for certifying the producer's scales and how often is it done?
  - 2b. How often should the private scales companies test the producer's scales?
  - 2c. What procedures would be used in the event of an obvious readout malfunction of the plant scales?
3. What conditions must all trucks meet before being tared for shipping material to state projects?
4. How often should trucks hauling to state projects be tared?
5. Explain how the Daily Summary Sheet (TL-102A) is used to document the shipment of material to state projects?
6. If the automatic printer becomes inoperative, how long and under what condition can the weighing operation be continued?
7. What information must be present on the shipping tickets?

\*Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**Applicant:** I understand that specific knowledge of each of the above tasks are a condition of certification. In addition, I understand these tasks will be performed in the weighing and shipping of materials to state construction projects and/or state maintenance projects.

Date: \_\_\_\_\_ Signature: \_\_\_\_\_

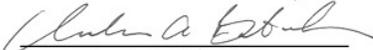
I certify that the applicant \_\_\_\_\_ has been examined on the above subject matter and in my opinion the candidate does \_\_\_\_\_ / does not\* \_\_\_\_\_ possess the necessary knowledge to function as a qualified weighperson.

Commonwealth of Virginia  
Certificate of Qualification



for  
Weighperson

*This is to certify that \_\_\_\_\_, Employed by \_\_\_\_\_,  
is qualified to serve as Weighperson when furnishing materials to be used in work for the  
Virginia Department of Transportation  
Awarded this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.*

  
State Materials Engineer

\_\_\_\_\_  
District Materials Engineer

Form TL-102A (Rev. 10/04)

**Insert Form Here**

Bond No. \_\_\_\_\_

**WEIGHPERSONS SURETY BOND  
FOR  
CONTRACTORS AND PROCEDURES OF MATERIAL FURNISHED BY THE ENGLISH TON  
(METRIC TON) KNOW ALL MEN BY THESE PRESENTS:**

That \_\_\_\_\_ of the City/ County of, \_\_\_\_\_ State of \_\_\_\_\_ doing business under the firm name of \_\_\_\_\_ An individual, partnership, or corporation \_\_\_\_\_ as PRINCIPAL and the \_\_\_\_\_ authorized to do business in the Commonwealth of Virginia, as SURETY, are held and firmly bound, effective the \_\_\_\_\_ Day of \_\_\_\_\_, unto the Commonwealth of Virginia, as obligee, in the full and just sum of Ten Thousand Dollars (\$10,000) for the payment whereof well and truly to be made to the Commonwealth of Virginia, we bind ourselves, our successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the here in before mentioned principal desires to conduct the business of furnishing materials by the English ton (Metric ton) for incorporation in Virginia Department of Transportation road and bridge construction and maintenance work.

The condition of this obligation is such that, whereas, the above bound principle is or is about to conduct business as outlined above for which a surely bond is required.

NOW, THEREFORE, if the above bound principal will faithfully observe and perform the duties required by Section 109.01(a), Measurement of Quantities, of the Virginia Department of Transportation Road and Bridge Specifications as amended, and indemnify said obligee, then the above obligations shall be void, otherwise to be and remain in full force and effect.

The continuing nature of this bond is such that it is required to be renewed on its anniversary date except the principal or the surety may terminate their obligations under this bond by giving sixty days notice, in writing, by registered mail, to the obligee.

IN WITNESS WHEREOF the said principal has here under set his or its hand and affixed here unto by its daily authorized official or agent and executed this instrument the \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

Principal Corporate Seal

\_\_\_\_\_  
Principal

BY \_\_\_\_\_  
President or Vice

President

Surely Corporate Seal

\_\_\_\_\_  
Surety

BY \_\_\_\_\_  
Attorney-in-Fact

Countersigned by

\_\_\_\_\_  
Virginia Resident

Agent

## **Appendix 4**

**Legal Load Determination Form**

**Maximum Weight Limitations Chart**

**Maximum Weight Determination Chart**

## LEGAL LOAD DETERMINATION FORM

Date: \_\_\_\_\_ Location: \_\_\_\_\_

Truck I.D. #: \_\_\_\_\_ Owned by: \_\_\_\_\_

Phone No.: \_\_\_\_\_

Trailer I.D.: \_\_\_\_\_ No. of Axles: \_\_\_\_\_

Extreme Axle Spacing (ft, rounded up to nearest ft): \_\_\_\_\_

Overload Permit Percentage: \_\_\_\_\_

Legal Gross Weight from MLGW Table \_\_\_\_\_ lbs \_\_\_\_\_ tons

Overload % (0. \_\_\_\_\_ ) x Legal Gross Weight + \_\_\_\_\_ lbs \_\_\_\_\_ tons

Maximum Legal Gross Weight = \_\_\_\_\_ lbs \_\_\_\_\_ tons

Tare Weight = \_\_\_\_\_ lbs \_\_\_\_\_ tons

Maximum Legal Net Weight = \_\_\_\_\_ lbs \_\_\_\_\_ tons

**Tare weight is to be determined with fuel tank full and operator seated in the vehicle. The legal weights shown are based on the tare weight on this date and the assumption that an overload permit for the allowable gross and net weights has been obtained. These subsequent modifications to the vehicle's weight will require a recalculation of allowable weights. Permitted overload adjustments in the maximum legal gross weight are not applicable to transport over the Interstate Highway System. All overload permit decals must be posted on both sides of the vehicle and be current to be utilized in setting load limits. Allowing overload permits to expire will invalidate maximum load limits found herein.**

**Attention: Truck Owner/Driver: This form is to remain in the truck when taring & hauling to VDOT projects or purchase orders.**

Is there a snowplow hitch installed: \_\_\_\_\_ Yes \_\_\_\_\_ No

Remarks: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Expiration Date: \_\_\_\_\_

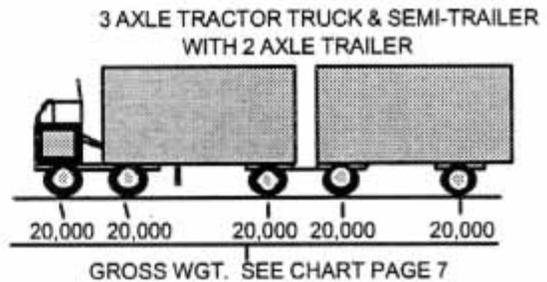
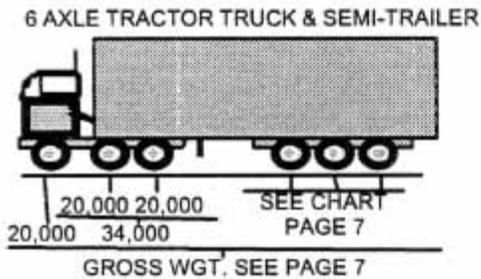
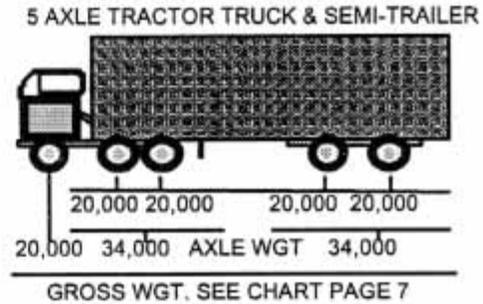
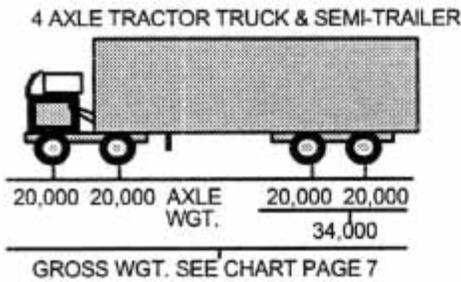
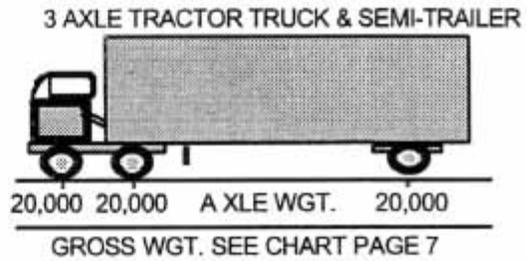
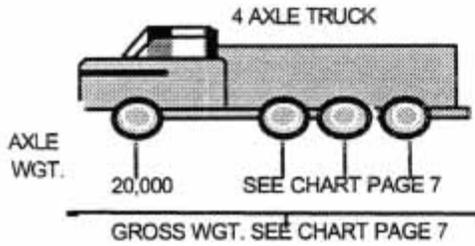
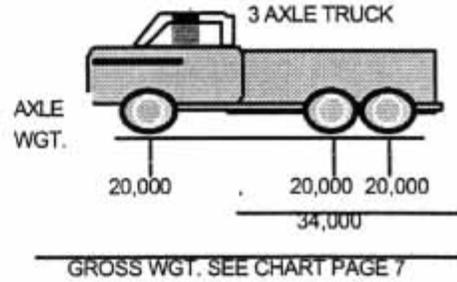
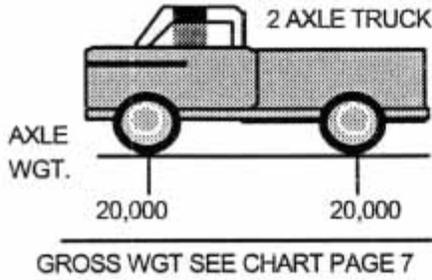
\_\_\_\_\_  
Driver's Signature

\_\_\_\_\_  
Signature of person determining legal load

Copies to:  
Truck Driver  
Certified Weighperson

Report No.: \_\_\_\_\_

## Maximum Weight Limitations



**Maximum gross weight is determined by the number of axles and the distance between first and last axles.**

**Weight Allowed Based on Axle Spacing**

The maximum gross weight is determined by the total number of axles and by measuring the distance between the first axle (steering) and extreme rear axle. The maximum weight allowance for axle groups is determined by measuring the distance between the center of the first axle and the center of the last axle and the number of axles within a specific axle group. Look up the distance between axles and the appropriate number of axles or axle groups on the chart below to obtain the maximum gross or axle group weight allowance.

**Distance in Feet Between the Extremes of any Group of 2 or More Axles**

**Maximum Weight in Pounds Carried on any Group of Axles**

	<u>2 Axles</u>	<u>3 Axles</u>	<u>4 Axles</u>	<u>5 Axles</u>	<u>6 Axles</u>	<u>7Axles</u>
4 .....	34,000					
5 .....	34,000					
6 .....	34,000					
7 .....	34,000					
8 .....	34,000	34,000				
9 .....	39,000	42,500				
10 .....	40,000	43,500				
11 .....		44,000				
12 .....		45,000	50,000			
13 .....		45,000	50,500			
14 .....		46,500	51,500			
15 .....		47,000	52,000			
16 .....		48,000	52,500	58,000		
17 .....		48,500	53,500	58,500		
18 .....		49,500	54,000	59,000		
19 .....		50,000	54,500	60,000		
20 .....		51,000	55,500	60,500	66,000	
21 .....		51,500	56,000	61,000	66,500	
22 .....		52,500	56,500	61,500	67,000	
23 .....		53,000	57,500	62,500	68,000	
24 .....		54,000	58,000	63,000	68,500	74,000
25 .....		54,500	58,500	63,500	69,000	74,500
26 .....		55,500	59,500	64,000	69,500	75,000
27 .....		56,000	60,000	65,000	70,000	75,500
28 .....		57,000	60,500	65,500	71,000	76,500
29 .....		57,500	61,500	66,000	71,500	77,000



Distance in Feet Between the Extremes of any Group of 2 or More Axles

Maximum Weight in Pounds Carried on any Group of Axles

	<u>2 Axles</u>	<u>3 Axles</u>	<u>4 Axles</u>	<u>5 Axles</u>	<u>6 Axles</u>	<u>7Axles</u>
30		58,500	62,000	66,500	72,000	77,500
31		59,000	62,500	67,500	72,500	78,000
32		60,000	63,500	68,000	73,000	78,500
33			64,000	68,500	74,000	79,500
34			64,500	69,000	74,500	80,000
35			65,500	70,000	75,000	
36			66,000	70,500	75,500	
37			66,500	71,000	76,000	
38			67,500	72,000	77,000	
39			68,000	72,500	77,500	
40			68,500	73,000	78,000	
41			69,500	73,500	78,500	
42			70,000	74,000	79,000	
43			70,500	75,000	80,000	
44			71,500	75,500		
45			72,000	76,000		
46			72,500	76,500		
47			73,500	77,500		
48			74,000	78,000		
49			74,500	78,500		
50			75,500	79,000		
51			76,000	80,000		

Note: Any fraction of a foot is rounded to the next highest foot.



**Virginia's Size, Weight and Equipment Requirements**

## Appendix 5

### Definitions of Terms

The terms defined in this section pertain to the technical meaning when used in the Scales Code, State Specifications, and Reports.

**Absolute Value** – The absolute value of a number is the magnitude of that number without considering the positive or negative sign.

**Automatic Bulk Weighing System** – A weighing system adapted to the automatic weighing of bulk commodities in successive drafts of predetermined amounts, automatically recording the no-load and loaded weight values and accumulating the net weight of each draft.

**Automatic Hopper Scale** – One adapted to the automatic weighing of bulk commodity in successive drafts of predetermined amounts.

**Automatic – Indicated Scale** – One of which the weights of applied loads of various magnitudes are automatically indicated throughout all or a portion of the weighing range of the scale. (A scale that automatically weighs out commodity in predetermined drafts, such as an automatic hopper scale, a packaging scale, and the like, is not an “automatic- indicating scale”).

**Axle- Load Scale** – A scale permanently installed in a fixed location, having a load receiving element specially adapted to determine the combined load on all wheels (1) on a single axle or (2) on a tandem axle of a highway vehicle.

**Balance Indicator** – A combination of elements, one or both of which will oscillate with respect to the other, for indicating the balance condition of a non-automatic indicating scale. The combination may consist of two indicating edges, lines, or points, or a single edge, line, or point and a graduated scale.

**Balance Mechanism** – A mechanism (including a balance ball) that is designed for adjusting a scale to an accurate zero- load balance condition.

**Beam Scale** – One on which the weights of loads of various magnitudes are indicated solely by means of one or more weigh beam bars either alone or in combination with counterpoise weights.

**Bid** - A proposal, formally submitted, covering the fee per designated unit of an item of work contemplated.

**Concentrated Load Capacity (CLC)** – A capacity rating of a vehicle, axle-load or livestock scale, specified by the manufacturer, defining the maximum load concentration for which the weighbridge is designed. This capacity rating is for both test and use.

**Condemnation Tag** – A tag that is applied to a weight or measure that fails to pass an official inspection, the application of which the tag requires the immediate removal of the weight or measure from service.

**Construction – Material Hopper Scale** – A scale adapted to weighing construction materials such as sand, gravel, cement, and hot oil.

**Contract** – Written agreement executed between the Department and Contractor, setting forth obligations of the parties thereunder, including, but not limited to the performance of the work, the furnishing of labor and materials and the basis of payment.

**Counter Scale** – Due to the size, weight and arrangement of parts of the apparatus it is used on a counter or bench top, which is non-formally called a “bench scale”.

**Counterbalance Weight** – One intended for application near the end of a weighbeam for zero-load balancing purposes.

**Counterpoise Weight** – A slotted or “hanger” weight intended for application near the tip of the weighbeam of a scale having a multiple greater than 1.

**Decreasing – Load Test** – A test for automatic-indicating scales only, wherein the performance of the scale is tested as the load is reduced.

**Discrimination (of an automatic – indicating scale)** – The value of the test load on the load-receiving element of the scale that will produce a specified minimum change of the indicated or recorded value on the scale.

**Equal – Arm Scale** – A scale having only a single lever with equal arms (that is, with a multiple of 1), equipped with two similar or dissimilar load – receiving elements (pan, plate, platter, scoop, or similar), one intended to receive material being weighed and the other intended to receive weights. There may or may not be a weighbeam.

**Fractional Bar** – A weighbeam bar of relatively small capacity for obtaining indications intermediate between notches or graduations on a main or a tare bar.

**Group of Axles** – Means any two or more consecutive axles located under a vehicle or combination.

**Gross Weight** – It is the total weight of a commodity, including the weight of the vehicle, driver, and a fuel.

**Hopper Scale** – A scale designed for weighing bulk commodities whose load – receiving element is a tank, box, or hopper mounted on a weighing element.

**Increasing – Load Test** – A basic performance test for a scale in which observations are made as increments of test load are successively added to the load – receiving element of the scale.

**Load Cell** – A device, whether electric, hydraulic, or pneumatic, that produces a signal proportional to the load applied.

**Load – Receiving Element** – The element of a scale that is designed to receive the load to be weighed; for example, platform, deck, rail, hopper, platter, plate and scoop.

**Main Bar** – A principal weighbeam bar, usually of relatively large capacity as compared with other bars of the same weighbeam. Example: on an automatic – indicating scale equipped with a weighbeam, the main weighbeam bar is frequently called the “capacity bar”.

**Main – Weighbeam Elements** – The combination of a main bar and its fractional bar, or a main bar alone if no fractional bar is associated with it.

**Materials** – Any substances specified for use in the construction of a project and its appurtenances.

**Minimum Tolerances** – Minimum tolerances are the smallest tolerance values that can be applied to a scale. It is determined on a basis of the value of the minimum graduated interval or the nominal or reading face capacity of the scale.

**Net Weight** – It is the total vehicle weight minus the tare weight, with the driver and fully fueled.

**NIST** – National Institute of Standards and Technology.

**National Institute of Standards and Technology Handbook 44** – Specifications, tolerances, and other technical requirements for weighing and measuring devices.

**Nominal Capacity** – The nominal capacity of a scale is (a) the largest weight indication that can be obtained by the use of all of the reading or recording elements in the combination, including the amount represented by the removable weights furnished or ordinarily furnished with the scale, but excluding the amount represented by any extra removable weights not ordinarily furnished with the scale, and excluding also the capacity of any auxiliary weighing attachment not contemplated by the original design of the scale, and excluding any fractional bar with a capacity less than 2.5 % of the sum of the capacities of the remaining reading elements or (b) the capacity marked on the scale by the manufacturer, whichever is less.

**Nominal Capacity, Batching Scale** – The nominal capacity of a batching scale is the capacity as marked on the scale by the scale manufacturer, or the sum of the products of the volume of each of the individual hoppers, in terms of cubic feet, times the weight per cubic foot of the heaviest material weighed in each hopper, whichever is less.

**Nominal Capacity, Hopper Scale** – The nominal capacity of a hopper scale is the capacity as marked on the scale by the scale manufacturer, or the product of the volume of the hopper in

bushels or cubic feet times the maximum weight per bushel or cubic foot, as the case may be, of the commodity normally weighed, whichever is less.

**Noise – Iron** – A side mounted, manually – adjustable pivot assembly for changing the multiple of a lever.

**Over – and - Under Indicator** – An automatic – indicating element incorporated in or attached to a scale and comprising an indicator and a graduated scale with a central or intermediate “zero” graduation and a limited range of weight graduations on either side of the zero graduation, for indicating weights greater than the predetermined values for which other elements of the scale may set. Note: A scale having an over - and – under indicator as classed as an automatic – indicating scale.

**Payment Bond** – The security furnished to guarantee to the Department the payment of all persons supplying labor and materials in the prosecution of the subcontracted work in accordance with the terms of the Contract.

**Performance Bond** – Bond of the Contractor in which a surety guarantees to the Department that the work will be performed in accordance with the contract documents.

**Prequalification** – This Procedure is used to assure the Department of Contractor’s ability to perform the work; experience in similar work; sufficient equipment to accomplish the work; and that the Contractor’s financial resources will permit the financing of the work.

**Point – of – Sale. System** – An assembly of elements including a weighing element, an indication element, and a recording element, (and may be equipped with a “scanner”) used to complete a direct sales transaction.

**Poise** – A movable weight mounted upon or suspended from a weighbeam bar and used in combination with graduations, and frequently with notches, on the bar to indicate weight values. **Note:** A suspended poise is commonly called a “hanging poise”.

**Ratio Test** – Determines the accuracy with which the actual multiple of a scale agrees with its designed multiple. This test is used for scales employing counterpoise weights and is made with standard test weights substituted in all cases for the weights commercially used in on the scale.

**Reading Face** – The element of an automatic – indicating scale on which weight values are automatically indicated.

**Reading - Face Capacity** – The largest weight that may be indicated on the reading face, exclusive of the application of any unit weights, weight ranges, or other elements.

**Recording Scale** – One on which the weights of applied loads may be permanently recorded electronically or other methods approved by the Department.

Scale Divisions, Number of (n) – Quotient of the capacity divided by the value of the scale division:  $n = \frac{\text{Cap}}{d}$

**Rejection Tag** – A tag is applied to a weight or measure that fails to pass an official inspection, the application of which tag requires the removal of the weight and measure for service if the weight or measure is not adjusted to conform to requirements specified by the Weights and Measures Act of Virginia (§3.1-919et seq.) or any regulation adopted thereunder.

**Scale Division, Value of (d)** – The value of the scale division, expressed in units of mass, is the smallest subdivision of the scale for analog indication or the difference between two consecutively indicated or printed values for digital indication or printing.

**Scale Section** – A part of a vehicle, axle-load, livestock, or railway truck scale consisting of two main load supports, usually transverse to the direction in which the load is applied.

**Section Test** – A shift test in which the test load is applied over individual sections of the scale. This test is conducted to disclose the weighing performance of individual sections, since scale capacity test loads are not always available and loads weighed are not always distributed evenly over all main load supports.

**Select Material** – Material obtained from roadway cuts, borrow areas or commercial sources and designated or reserved for use as foundation for the subbase, subbase material, shoulder surfacing or other specific purposes.

**Sensitivity (of a non-automatic-indicating scale)** – The value of the test load on the load-receiving element of the scale that will produce a specified minimum change in the position of rest of the indicating element or elements of the scale.

**Sensitivity Requirement (SR)** – A performance requirement for a non-automatic-indicating scale; specifically, the minimum change in the position of the rest of the indicating element or elements of the scale in response to the increase or decrease, by a specified amount, of the test load on the load-receiving element of the scale.

**Service of Weights and Measures; repair** – Any registered service agency or certified service technician in the employ of the service agency may: <sup>a</sup> place into service, subject to an official inspection, a new or used weight or measure and <sup>b</sup> following corrective repair, remove any rejection tag or condemnation tag and return the weight or measure to service, subject to an official inspection.

**Service Technician Certification** – The technician is certified by a (or employed by) registered service agency. Every technician shall obtain certification by the Commissioner before operating in Virginia and shall renew the certification annually. The application for the certification as a service technician or renewal shall be made in writing on a form supplied by the Commissioner.

**Shift Test** – A test intended to disclose the weighing performance of a scale under off-center loading.

**Single Axle** – Means an assembly of two or more wheels whose centers are in one transverse vertical plane or may be included between two parallel transverse vertical planes forty inches apart, extending across the full width of the vehicle.

**Single Axle Weight** – The total weight transmitted by all wheels whose centers may be included between two parallel transverse vertical planes 40 inches apart, extending across the full width of the vehicle. The Federal single axle weight limit on the Interstate is 20,000 pounds.

**Span (structural)** – The distance between adjoining sections of a scale.

**Specifications** – General term comprising all the directions, provisions and requirements contained herein, together with such as may be added or adopted as supplemental specifications or special provisions, all of which are necessary for the proper performance of the contract.

**Tandem Axle** – Means any two or more consecutive axles whose centers are more than forty inches but not more than ninety-six inches apart, and are individually attached to and / or articulated from a common attachment to the vehicle including a connecting mechanism designed to equalize the load between axles.

**Tandem Axle Weight** – The total weight transmitted to the road by two or more consecutive axles whose centers may be included between parallel vertical planes spaced more than 40 inches and not more than 96 inches apart, extending across the full width of the vehicle. The Federal tandem axle weight limit on the Interstate is 34,000 pounds.

**Tare** – The weight of the fully fueled vehicle and driver, which is deducted from the total weight to determine the weight of the contents or load.

**Tare Mechanism** – A mechanism (including a tare bar) designed for determining or balancing out the weight of packaging material, containers, vehicles, or other materials that are not intended to be included in net-weight determinations.

**Tare-Weighbeam Elements** – The combination of a tare bar and its fractional bar, or a tare bar alone if no fractional bar is associated with it.

**Type** – The term “type” shall be construed to mean a model or models of a particular measurement system, instrument, element, or a field standard that positively identifies the design. A specific type may vary in its measurement ranges, size, performance, and operating characteristics.

**Unit Train** – A unit train is defined as a number of contiguous cars carrying a single commodity from one consignor to one consignee. The number of cars is determined by agreement among the consignor, consignee, and the operating railroad.

**Unit Weight** – One contained within the housing of an automatic-indicating scale and mechanically applied to and removed from the mechanism. The application of a unit weight will increase the range of automatic indication, normally in increments equal to the reading-face capacity.

**Variable Division-Value Scale** – A scale so designed that the value of the verification scale division (e), in the same unit of weight, increases at certain load values within the weighing range of the scale.

**Vehicle Scale** – A scale adapted to weighing highway, farm, or other large industrial vehicles (except railroad freight cars), loaded or unloaded.

**Verification Scale Division, value of (e)** – A value, expressed in units of weight and specified by the manufacturer of a device, by which the tolerance values and the accuracy class applicable to the device are determined. The verification scale division is applied to all scales, in particular to ungraduated devices since they have no graduations. The verification scale division, e, may be different from the displayed scale division, d, for certain other devices used for weight classifying or weighing in pre-determined amounts, and certain other Class I and II scales.

**Weighbeam** – An element comprising one or more bars, equipped with movable poises or means for applying counterpoise weights or both.

**Weighment** – A single complete weighing operation.

**Weight Classifier** – A digital scale that rounds weight values up to the next scale division. These scales usually have a verification scale division, e, which is smaller than the displayed scale division.

**Weight Ranges** – Electrical or electro-mechanical elements incorporated in an automatic-indicating scale through the application of which the range of automatic indication of the scale is increased, normally in increments equal to the reading-face capacity.

**Wheel-load Weighers** – Compact, self-contained, portable weighing elements specially adapted to determining the wheel loads or axle loads of vehicles on highways for the enforcement of highway weight laws only.

**Work** – Work shall mean the furnishing of all labor, materials, equipment and other incidentals necessary or convenient to the successful completion of the project and the carrying out of all the duties and obligations imposed by the Contract.

**Zero-load Balance** – A correct weight indication or representation of zero when there is no load on the load-receiving element. (See also “zero-load balance for an automatic-indicating scale”, “zero-load balance for a non-automatic-indicating scale”, “zero-load balance for a recording scale”).

**Zero-load Balance for an Automatic-Indicating Scale** – A condition in which the indicator is at rest at, or oscillates through approximately equal arcs on either side of the zero graduation.

**Zero-load Balance for a Non-automatic-indicating Scale** – A condition in which (a) the weighbeam is at rest at, or oscillates through approximately equal arcs above and below, the center of a trig loop; (b) the weighbeam or lever system is at rest at, or oscillates through approximately equal arcs above and below a horizontal position or a position midway between limiting stops; or (c) the indicator of a balance indicator is at rest at, or oscillates through approximately equal arcs on either side of the zero graduation.

**Zero-load Balance for a Recording Scale** – A condition in which the scale will record a representation of zero load.

**Zero-Setting Mechanism** – Means provided to attain a zero balance indication with no load on the load-receiving element. Three types of these mechanisms are:

<sup>1</sup>**Automatic Zero-Setting Mechanism** – Automatic means provided to maintain zero balance indication without the intervention of an operator.

<sup>2</sup>**Manual Zero-Setting Mechanism** – Non-automatic means provided to attain a zero balance indication by the direct operation of a control.

<sup>3</sup>**Semi-Automatic Zero-Setting Mechanism** – Automatic means provided to attain a direct zero balance indication requiring a single initiation by an operator.

**Zone of Uncertainty** – The zone between adjacent increments on a digital device in which the value of either of the adjacent increments may be displayed.