

**SUBSECTION 4.21
WEIGHING AND MEASURING EQUIPMENT**

I. Description: The contractor will provide weighing and measuring equipment for materials measured or proportioned by weight or volume.

II. Equipment: Provide certified scales, scale installations, and measuring equipment meeting the requirements of National Institute of Standard and Technology Handbook 44, except that the required accuracy must be 0.4% of the material being weighed or measured. Provide personnel, facilities, and equipment for checking the scales to the satisfaction of the ODR. Check all weighing and measuring equipment after each move and at least once each 6 mo. or when requested. Calibrate all scales using weights certified by the Texas Department of Agriculture or an equivalent agency approved by the ODR. Provide a written calibration report from a scale mechanic for all calibrations. Cease plant operations during the checking operation. Do not use inaccurate or inadequate scales. When adjusting equipment, bring performance errors as close as practicable to zero. Furnish sufficient certified weights to check the accuracy and sensitivity of the scales. Insulate scales against shock, vibrations, or movement of other operating equipment. On a daily basis, provide an automated ticket printout for each truckload of material where payment is determined by weight. Each loading ticket must show the ticket number, truck number, gross weight, tare weight, and net weight. If required on the plans for materials paid for by the ton, provide a summary spreadsheet that lists separately the ticket number, truck number, gross weight, tare weight, net weight, overload weight, and payment weight amounts as shown in Table 1. Submit all summary sheets, within 2 days of delivery of materials, provide the totals for net weight and overload amounts to be deducted. Include the overload deduction in the total amount reported for payment. Submissions are subject to verification by the ODR. Furnish leak-free weighing containers large enough to hold a complete batch of the material being measured.

Table 1
Example Spreadsheet

Ticket No.	Truck No.	Gross Wt.	Tare Wt.	Net Wt.	Overload Wt.	Payment Wt.
				Totals	Totals	Totals

A. Truck Scales: Furnish platform truck scales capable of weighing the entire truck or truck–trailer combination in a single draft.

B. Aggregate Batching Scales: Equip scales used for weighing aggregate with a quick adjustment at zero that provides for any change in tare. Provide a visual means that indicates the required weight for each aggregate.

C. Suspended Hopper: Provide a means for the addition or the removal of small amounts of material to adjust the quantity to the exact weight per batch. Ensure the scale equipment is level.

D. Belt Scales: Use belt scales for proportioning aggregate that are accurate to within 1.0% based on the average of 3 test runs, where no individual test run exceeds 2.0% when checked in accordance with Tex-920-K.

E. Asphalt Material Meter: Provide an asphalt material meter with an automatic digital display of the volume or weight of asphalt material. Verify the accuracy of the meter in accordance with Tex-921-K. When using the asphalt meter for payment purposes, ensure the accuracy of the meter is within 0.4%.

When used to measure component materials only and not for payment, ensure the accuracy of the meter is within 1.0%.

F. Liquid Asphalt Additive Meters: Provide a means to check the accuracy of meter output for asphalt primer, fluxing material, and liquid additives. Furnish a meter that reads in increments of 0.1 gal. or less. Verify accuracy of the meter in accordance with Tex-923-K. Ensure the accuracy of the meter within 5.0%.

G. Particulate Solid and Slurry Additive Meters: Provide a means to check the accuracy of meter output for particulate solids (such as hydrated lime or mineral filler) and slurries (such as hydrated lime slurry). Ensure the accuracy of the meter within 5.0%.

III.Measurement and Payment: The work performed, materials furnished, equipment, labor, tools, and incidentals will not be measured or paid for directly, but will be subsidiary to pertinent Items.