

Payment will be made under:

Item No. 685	Blast cleaning Portland cement concrete structures	Per square yard (meter)
Item No. 685	Blast cleaning Portland cement concrete median barriers—variable height	Per linear mile (kilometer)

### 685.5.01 Adjustments

General Provisions 101 through 150.

## Section 690—Static Scale System

### 690.1 General Description

This work includes furnishing and installing components for three-axle load static scale weighing systems according to the Plans and Specifications. Install the scales in truck weighing stations.

#### 690.1.01 Definitions

General Provisions 101 through 150.

#### 690.1.02 Related References

##### A. Standard Specifications

- Section 101—Definitions and Terms
- Section 105—Control of Work
- Section 108—Prosecution and Progress
- Section 109—Measurement and Payment
- Section 500—Concrete Structures
- Section 511—Reinforcement Steel
- Section 853—Reinforcement and Tensioning Steel

##### B. Related Documents

National Institute of Standards and Technology Handbook 44

#### 690.1.03 Submittals

##### A. Material, Equipment, and Shop Drawings

After the Contract is awarded, submit the following to the Engineer for approval:

- Complete materials list
- Complete Shop Drawings
- List of equipment with supporting data that will be incorporated into the work

Identify each Item on the material and equipment list with an applicable Section and Subsection from the Specifications.

Allow the Department 60 days for review of materials, equipment, shop drawings and other manufacturer's data.

##### B. Manufacturer's Data

Along with the materials and equipment list, submit manufacturer's catalogs, cuts, diagrams, performance curves, charts, and other data demonstrating that equipment adheres to the Specifications and Plans. Model numbers alone are not acceptable.

##### C. Manufacturer's Guarantees and Instructions

Submit manufacturer's guarantees on materials and equipment, as well as manufacturer's instruction manuals. The Engineer will transmit these to the Department for future operation and maintenance of the truck scale system. Ensure that guarantees are subject to transfer.

**D. Contractor Warranty**

Before beginning work, furnish a written warranty for the static scale system according to Subsection 690.3.07.

**E. Brand Names or Equal**

When materials and equipment are designated in the Plans or Specifications by “brand names or equal,” the equal materials may be used with the Engineer’s approval. Submit the name and complete description of the equal material or equipment in writing. Also submit supporting data for equipment performance according to Subsection 690.1.03 above.

**690.2 Materials**

Ensure that materials and equipment conform to the electronic axle load scale Plans and these Specifications. The Contractor’s attention is directed to Subsection 105.04.A, “Specifications of Other Organizations”.

Furnish new materials and equipment subject to the Engineer’s approval.

**A. Electronic Axle Truck Scale Components**

Use the following standard package components and accessories for permanent scale installation according to the Plans and this Section:

- Three electronic weighing platforms
- Three weight indicating and recording elements with one totalizer
- Reinforced concrete scale pits and approach aprons
- Traffic signal lights and controls
- Conduit and cable with electrical installation for axle scales and traffic signal lights

**B. Weighing Platforms and Load Cells**

Install each of the 3 weighing platforms in a common pit capable of simultaneously weighing 3 tandem axles that vary from 40 in to 54 in (1 m to 1.4 m) center-to-center.

Install each weighing platform with the following capacities:

- At least 40,000 lb (18 000 kg) capacity
- Capacity to weigh an axle unit up to 12 ft (3.7 m) wide in one operation
- One-axle maximum capacity
- Capability to withstand 100 percent transit side load

## 1. Load Cells

Install each weighing platform with electronic load cells with the following capabilities:

- At least 20,000 lb (9000 kg) capacity
- At least 200 percent overload rating
- One-time static overload capacity of at least 300 percent of normal without structural failure

Environmentally seal each cell against moisture and corrosion under normal pit conditions. (See Subsection 690.3.05.A, “Reinforced Concrete Scale Pit Construction.”)

## 2. Axle Scales

Ensure that each weighing platform’s axle load scale has a 0.1 percent test load acceptance tolerance according to the National Institute of Standards and Technology Handbook 44.

## 3. Axle Weigh Bridges

Equip each weighing platform’s axle weigh bridge with appropriate check devices designed to prevent the reinforced concrete platform from moving horizontally.

**C. Weight Indicating and Recording Elements**

Use easily replaced and repaired plug-in weight indicators, printers, interfacing, and memory storage units.

Power the weight indicating and recording elements using a 115-volt AC, 60 hertz, single phase electricity.

Furnish one spare weight indicator and one spare electronic printer in case of electronic equipment interruptions.

### 1. Digital Weight Indicator

Provide each weighing platform with an individually housed digital indicator with these features:

- Weight indicating capability of maximum 20 lb (10 kg) increments
- Measuring capability of up to 99,980 lbs (45 350 kg)
- Five-digit illuminated displays using at least ½ in (13 mm) high digits
- Easily replaced snap-in snap-out type printed circuit boards for the indicator electronics
- Push-button zero that can eventually take an additional outside digital indicator for driver viewing

### 2. Printer Recorder

Provide an individually housed dot-matrix programmable printer-totalizer capable of printing letters and numbers on paper tape with the following format:

Georgia Department of Transportation

\_\_\_\_\_ County Weigh Station

\_\_\_\_\_ Bound Lane

\_\_\_\_\_ (Date/Time)

(The following chart is a format example only.)

Axle 1	11,980 lbs (5434 kg)
Axle 2	17,860 lbs (8101 kg)
Axle 3	18,200 lbs (8255 kg)
Axle 4	19,720 lbs (8945 kg)
Axle 5	18,800 lbs (8528 kg)
Axle 6	18,500 lbs (8391 kg)
Gross	105,060 lbs (47 654 kg)

a. Install printer systems with the following:

- Print control switches on each individual weighing platform
- Totalizer memory bank status indicators capable of 0.1 percent accuracy for each of the 3-axle load scales
- Twenty-four-hour clocks

### D. Reinforced Concrete Scale Pits

See Subsection 690.3.05.A, “Reinforced Concrete Scale Pit Construction.”

### E. Traffic Signal Lights and Controls

Use three traffic signals, equipped as follows:

- Two 8 in (203 mm) diameter lenses
- Two 150-watt signal bulbs
- Visors over each lens

### F. Conduit and Cable

Furnish and install according to the National Electrical Code conduit, cable and pull boxes, junction boxes, shielding, grounding, surge voltage lightning protection between the weight indicating and recording element and the scale, the weight platforms, pit light, receptacle, and appurtenances.

See Subsection 690.3.05.D for installation.

### 690.2.01 Delivery, Storage, and Handling

Do not use the interstate Right-of-Way outside the truck weighing station to store equipment or supplies.

## 690.3 Construction Requirements

### 690.3.01 Personnel

#### A. Training

During the Acceptance Performance Test (APT) period following installation, train at least 10 Department-designated people to operate and maintain the truck weighing station systems. Furnish two operations and maintenance manual(s) for each set of platforms.

1. Provide one day of on-the-job instruction in weighing trucks and using controls for weighing, recording, and traffic signal.
2. Provide one day of training in routine maintenance and trouble-shooting to determine probable causes of malfunctions.

#### B. Assistance During APT

Provide a trained static scale system specialist to assist in system operation for approximately one week during the APT.

### 690.3.02 Equipment

General Provisions 101 through 150.

### 690.3.03 Preparation

Truck weighing station construction may already be in progress. Coordinate operations with utility companies and other Contractors to complete the work quickly.

### 690.3.04 Fabrication

General Provisions 101 through 150.

### 690.3.05 Construction

Maintain limit of access to the truck weighing station. Enter and exit the station by ramps only.

#### A. Reinforced Concrete Scale Pit Construction

Furnish the reinforced concrete scale pits complete, including the structural design. Ensure the structural design supports the maximum compression load cell overload capacity without structural failure (see Subsection 690.2.B).

##### 1. Concrete Work

Install scale pit concrete including sleeves, piping, conduits, anchors, frames, other Items to be built-in, and other required Work and appurtenances.

Do concrete Work according to Section 500 and Section 511.

Use deformed billet steel bars for bar reinforcement steel according to Subsection 853.2.

##### 2. Scale Pit Construction

Construct scale pits and aprons at locations designated on the Plans and as follows:

- a. Make the top of the pit and aprons flush and level with the adjoining pavement.
- b. Furnish and install a pit drain connected to a 4 in (100 mm) drain line, provided by the Department, to a point below and near the center of the scale pit unless otherwise noted on the Plans.
- c. Provide a float-controlled high water alarm system in the scale pits that automatically activates a red warning light within the operator's tower when water in the scale pit reaches 6 in (150 mm) deep.
- d. Install an alarm buzzer with the high water alarm system in the operator's tower. Equip the buzzer with a volume control.
- e. Provide scale pits with an access cover and manhole with at least 3 ft (1 m) of vertical crawl space for equipment inspection and maintenance.
- f. Enclose each scale platform and pit with steel coping.

#### B. Traffic Lights and Controls

Install and wire three red (stop)–green (go) traffic signal lights and controls as indicated on the Plans. and as follows:

1. Place two of these traffic lights in the bypass lane. Operate these using one common three-position (red-off-green) toggle switch located on the counter in the operations tower.
2. Place the third traffic light at the axle load scales area. Operate this at the scales console in the operations tower.

### C. Span and Calibration Adjustments

Place span and calibration adjustments for the entire weighing system inside the weighing station building at the indicators. Install the adjustments so that replacing the circuit board does not require recalibration of the scales.

### D. Cable and Conduit Connections

Install cable connections in conduit between the elements and the platform scales.

Follow these requirements for cable and installation:

- Conform to Section XV of the Scale Manufacturer's Association's Specification Recommendations.
- Use armored flexible cable between scale pits and load cells.
- Use Schedule 40 PVC for the buried conduit between the scale pits and the operations building.
- Environmentally seal the load cell and underground connector cable connections.

### 690.3.06 Quality Acceptance

Time is of the essence in this Contract. Complete installation and testing on or before the Project completion date and be ready for the Department's acceptance performance test.

Test with weights certified and calibrated according to Georgia Department of Agriculture standards.

Measure the acceptance tolerance of the weighing system according to Subsection 690.2.B.

#### A. Acceptance Performance Test (APT)

The APT shall demonstrate to the Department's satisfaction that the static scale system consistently meets the performance requirements of the Plans and Specifications.

At the conclusion of a successful APT, apply 0.2 percent maintenance tolerance to the scales and equipment until they are recalibrated.

##### 1. Testing Procedure

Submit a test plan to the Department for approval within 30 days after the Notice to Proceed.

Begin the APT on the first normal working day following completion, calibration, and testing of the installation.

During the APT period, the Department will operate the static scale system for approximately 8 hours per day, 5 days per week for 8 consecutive weeks.

Provide a trained static scale system specialist to assist in the operation for approximately 1 week.

##### 2. Failure or Delay in Completing Work on Time

The Contractor's attention is directed to Subsection 108.08, "Failure or Delay in Completing Work on Time."

Liquidated damages will start on the day after the project completion date if the installation is not complete and ready for the APT.

Deductions for liquidated damages for each day of overrun in contract time will stop when the APT begins.

### 690.3.07 Contractor Warranty and Maintenance

#### A. Static Scale System Warranty

Before beginning construction, warrant the static scale system equipment in writing against defective material and workmanship.

Furnish the written warranty to the Department when submitting Shop Drawings for approval. Include the provision that warranties are subject to transfer to the Department.

Warrant that for 6 months from the beginning date of the APT that equipment will perform according to Subsection 690.2.B and Subsection 690.2.C, continuously serving as intended under conditions required for the equipment.

The written warranty must be accepted and approved by the Department before beginning installation of the static scale system.

The warranty excludes damage caused by fire, flooding, lightning, accidents, vandalism, or natural disasters.

**B. Warranty Service**

Write the warranty to cover materials, equipment, service, labor, travel, and incidentals necessary for warranty service at no additional cost to the Department.

Provide warranty service including the following:

1. Every 90 days during the period of warranty, calibrate to acceptance tolerance of scales using certified test weights.
2. Make additional warranty calls during regularly scheduled working hours Monday through Friday as requested by the Chief of Permits and Enforcement or a duly authorized representative. Make a maximum of 10 calls during the warranty period without additional charge to the Department.

Perform requested warranty service either the same day or on the first working day following the request.

**690.4 Measurement**

This work will not be measured separately for payment.

**690.4.01 Limits**

General Provisions 101 through 150.

**690.5 Payment**

Electronic axle load truck static scale system will be paid for at the Contract Lump Sum Price. Payment is full compensation for materials, equipment, labor, tools, direction, and incidentals necessary to complete the Item according to the Specifications and Plans. Payment includes the spare weight indicator and standby printer, calibration and testing, a 6-month warranty, and Department personnel training.

Partial payments will be made on the basis of the following schedule of payments expressed as a percentage of the Contract Lump Sum Price:

Scale pit construction	20%
Furnishing, installing, and calibrating the scales, weight indicator/recording element, and totalizer/printer	70%
End of 90-day acceptance performance testing as described under Subsection 690.3.06	10%

Payment will be made under:

Item No. 690	Electronic axle load truck static scale system truck weighing station_____	Per lump sum
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**690.5.01 Adjustments**

General Provisions 101 through 150.

**Section 691—Weigh-in Motion Scale System****691.1 General Description**

This work includes furnishing and installing weigh-in-motion system in truck weighing stations according to the Plans and Specifications.

The Department's objective is to have a system that automatically pre-selects vehicles in motion for weighing, then automatically directs the vehicles to the enforcement scales.

**691.1.01 Definitions**

General Provisions 101 through 150.

**691.1.02 Related References****A. Standard Specifications**

Section 101—Definitions and Terms

Section 105—Control of Work

Section 108—Prosecution and Progress