

622.5.01

The remaining 25 percent will be paid when the Project is complete or when the material is no longer needed and removed from the Project, whichever applies.

Payment will be made under:

Item No. 622	Precast concrete median barrier, method no.3	Per linear foot (meter)
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622.5.01 Adjustment

General Provisions 101 through 150.

Section 623—Pneumatically Applied Concrete

623.1 General Description

This item includes manufacturing and pneumatically placing concrete at locations and to the dimensions shown on the Plans. Follow the requirements of Section 441 and Section 500 for this work.

623.1.01 Definitions

General Provisions 101 through 150.

623.1.02 Related References

A. Standard Specifications

- Section 441—Miscellaneous Concrete
- Section 500—Concrete Structures
- Section 800—Coarse Aggregate
- Section 801—Fine Aggregate
- Section 830—Portland Cement
- Section 832—Curing Agents
- Section 833—Joint Fillers and Sealers
- Section 853—Reinforcement and Tensioning Steel
- Section 880—Water

B. Referenced Documents

- General Provisions 101 through 150.
- QPL 10

623.1.03 Submittals

General Provisions 101 through 150.

623.2 Materials

Use materials that meet the requirements of these Specifications:

Material	Section
Coarse Aggregate: Class A or B Stone	800
Portland cement	830
Fine Aggregate, Size No. 10	801
Water	880
Preformed Joint Filler	833.2.01
Hot Poured Joint Filler	833.2.02

Material	Section
Elastomeric Polymer Type Joint Compound	833.2.03
Welded Steel Wire for Concrete Reinforcement	853.2.07
Curing Agents	832
Silicone Joint Sealer	833.2.06

623.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

623.3 Construction Requirements

623.3.01 Personnel

Have qualified machine, nozzle, and re-bound operators prepare and apply pneumatically applied concrete under the supervision of qualified superintendents.

Furnish documentation of personnel qualifications upon request.

623.3.02 Equipment

Use equipment in good operating condition to work on the Project. Have all necessary equipment on the Project prior to beginning application.

623.3.03 Preparation

A. Earth Foundation

Prepare earth foundations for application as follows:

1. Thoroughly compact and finish the area upon which the pneumatically applied concrete will be placed to the lines and grades shown on the Plans.
2. Ensure that the foundation contains enough moisture to provide maximum density and to avoid absorbing water from the concrete. Ensure that the foundation does not contain free surface water.

B. Bonding Foundation

When bonding pneumatically applied concrete to a previously placed structure, ensure that the surface is rough and clean.

1. Remove unsound or deteriorated concrete, loose particles, dust, and dirt.
2. Thoroughly clean steel members by sand blasting loose rust, scale, or other deleterious material that would prevent or lessen the bond between concrete and steel.
3. Keep the bonding surface wet for at least one hour before applying the concrete. Remove any free water immediately before placing.

623.3.04 Fabrication

General Provisions 101 through 150.

623.3.05 Construction

A. Earth Foundation

1. Use gauging wires to establish finish grade lines, surface planes, and the Plan thickness.
2. Place joints, side forms, shooting strips, weep holes, and reinforcement according to Plan details.

B. Bonding Foundation

1. Reinforce and form concrete according to Plan details.
2. When sloping, vertical, or overhanging work surfaces require successive layers or thicknesses, allow enough time between application of layers to permit an initial but not a final set.

When the initial set is developing, clean the surface to remove laitance and to ensure bonding.

C. Placing Reinforcement

Place reinforcement, if required, as shown on the Plans.

1. When dowels or anchor bolts are specified, securely fasten the reinforcing steel to them.
2. Lap the welded wire fabric at least 4 in (100 mm) and firmly tie the full area of mesh or fabric in position with wire ties.
3. Place welded wire fabric around the top of slab-carrying beams and girders before pouring the slab and extend at least 5 in (125 mm) below the slab. Locate the fabric to properly lap the web reinforcement.
4. Place the reinforcement at least 0.5 in (15 mm) from the surface on which the concrete is to be placed.
Ensure that there is at least 0.75 in (20 mm) from the outside surface of the reinforcing to the finished surface of the concrete.

D. Composition

Use pneumatically applied concrete composed of one part Portland cement to three parts fine aggregate by volume. Thoroughly mix the dry ingredients before placing them into the applicator hopper. The Contractor may submit mix design proportions for approval from an approved producer (QPL 10) who has the capability of producing transit-mixed concrete.

1. Substitute a maximum of 30 percent by volume of No. 9 stone for an equivalent amount of fine aggregate when approved by the Engineer.
2. Discard material not used within one hour after combining cement and aggregates. Do not remix or temper the material.

E. Transporting and Placing

When premixing the materials and transporting them to the job site, follow the applicable requirements of Section 500 and these guidelines:

1. Do not place pneumatically applied concrete under these conditions:
 - The ambient temperature is below 40 °F (4 °C).
 - The subgrade is frozen.
 - Wind velocity prevents homogenous and uniform application.
2. Place the approved mix by pneumatic pressure through a machine with the proper amount of water for hydration applied at the mixing nozzle.
3. Maintain water pressure in the delivery pipe approximately 20 psi (140 kPa) above the air pressure in the machine.
4. Maintain a constant pressure of at least 45 psi (310 kPa) in the placing machine when the applicator hose length is 100 ft (30 m) or less.
Increase the pressure at least 5 psi (35 kPa) for each additional 50 ft (15 m) of hose length or fraction thereof, or for each 25 ft (7.5 m) vertically that the nozzle is above the machine.
5. When placing concrete on slopes pneumatically, limit the height to 8 ft (2.5 m) lifts measured along the slope.
6. Direct the applicator nozzle to minimize rebound. Maintain the nozzle velocity at a constant level and rate determined by the job conditions.

F. Finishing

After placing the concrete to the required depth and before the initial set, screed the surface and check it with a 10 ft (3 m) straightedge. Immediately correct irregularities in excess of 0.25 in. in 10 ft. (6 mm in 3 m).

Remove and replace loose areas of pneumatically applied concrete at the Contractor's expense. Before application, protect the adjacent areas not to be covered and clean after application if necessary.

G. Curing

Cure pneumatically applied concrete according to the applicable requirements of Subsection 500.3.05.Z.1, "General Curing—Supplying Additional Moisture."

H. Joints

Construct joints at locations indicated on the Plans and as specified in Section 441.

Slope construction joints to a clean edge of approximately 45 degrees. Before resuming the placing, clean and moisten the joint.

623.3.06 Quality Acceptance

General Provisions 101 through 150.

623.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

623.4 Measurement

Pneumatically applied concrete placed on slopes or plane areas are measured for payment by the square yard (meter) of accepted surface areas constructed to the neat lines indicated on the Plans or as directed.

Where pneumatically applied concrete is used for patching, grouting, plastering, or build-ups, it is measured by the ton (megagram) of cement actually used.

623.4.01 Limits

General Provisions 101 through 150.

623.5 Payment

Pneumatically applied concrete will be paid for at the Contract Price per square yard (meter) of paving or per ton (megagram) of cement as specified, complete in place. No separate payment will be made for reinforcing steel, joint-filling materials, clean-up, or disposal of rebound.

Payment will be made under:

Item No. 623	Pneumatically applied concrete	Per square yard (meter)
Item No. 623	Pneumatically applied concrete	Per ton (megagram) of cement

623.5.01 Adjustments

General Provisions 101 through 150.

Section 624—Sound Barriers**624.1 General Description**

This work includes furnishing and installing a sound barrier according to this Specification and conforming to the locations, dimensions, lines, and grades shown on the Plans.

Unless a specific type is required by the Contract documents, select one of the following barrier types. Identify in the Proposal the type upon which the bid is based.

Type A	Concrete masonry units
Type B	Interlock steel panels
Type C	Precast concrete panels
Type D	Treated timber panels
Type E	Masonry-coated polystyrene reinforced panels
Type F	Glass reinforced thermoset composite structural panels
Type G	Precast autoclaved aerated concrete (PAAC) panels

Schedule construction as specified in the Special Provisions for sequence of operations, the Plans, or as directed by the Engineer.

624.1.01 Definitions

General Provisions 101 through 150.

624.1.02 Related References**A. Standard Specifications**

Section 106—Control of Materials