

Special Specification 4182

Fiberglass Sound Walls



1. DESCRIPTION

Furnish the materials for and construct a fiberglass sound wall as shown on the plans and required by this specification.

2. MATERIALS

Use materials conforming to the pertinent requirements of the following:

ASTM Standards (See Table 1 for requirements):

E 90 – Standard Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions,

E 413 – Standard Classification for Determination of Sound Transmission Class,

E 795 – Test Method for Sound Absorption (N.R.C. Rating),

C 423 – Test Method for Sound Absorption (N.R.C. Rating),

D 638 – Test Method for Tensile Properties of Plastic,

D 638 – Test Method for Tensile Modulus,

D 638 – Test Method for % Elongation,

D 790 – Test Methods for Flexural Strength,

D 790 – Test Methods for Flexural Modulus,

D 792 – Test Methods for Specific Gravity,

D 695 – Test Methods for Compressive Strength,

D 2583 – Test Methods for Barcol Hardness,

D 256 – Test Methods for Impact Resistance, and

E 84 – Flame Spread Index.

The fiberglass sound wall will consist of stacked tongue and groove structural planks. The structural planks and fiberglass reinforcement shall be composed of materials, quantities, properties, and dimensions necessary to meet the design requirements of the proprietary wall system used.

When 2 or more proprietary systems are used, provide drawings for review indicating the proposed design arrangement.

The structural components of the system will be designed in accordance with the 1989 edition, incorporating 1992 & 2002 amendments, of the AASHTO Guide Specification for Structural Design of Sound Barriers except as superseded by the 2017 AASHTO LRFD Bridge Design Specification. Should a conflict between these specifications occur, the 2017 AASHTO LRFD Bridge Design Specification shall control.

Materials will conform to applicable design drawings.

The fiberglass sound barrier will meet the performance requirements of Table 1 when tested in accordance with the associated ASTM method.

Table1
Performance Requirements

Property	Requirement	ASTM Method
Flexural Modulus	1,600,000 psi	D-790
Flexural Strength	30,000 psi	D-790
Tensile Strength	30,000 psi	D-638
Tensile Modulus	2,500,000 psi	D-638
Compressive Strength	30,000 psi	D-695
Elongation	1.9	D-638
Specific Gravity	1.8	D-792
Barcol Hardness	40	D2583
Impact Resistance	25	D-256
Sound Transmission Class (STC)	28	E-90 & E413
N.R.C. Rating	0.95	E-795

3. GENERAL

Contractor will furnish a proprietary sound abatement wall system in accordance with the plans and this specification. Before beginning the work, the Contractor will submit manufacturer's drawings, shop drawings of framing, connection details, and design calculations for approval.

3.1. **Shop Drawings.** Shop drawings will be provided by the supplier, detailing all relevant aspects of installation and connection details, and stamped by a professional engineer registered in Texas.

3.2. **Dimensions.** Dimensions of the fiberglass sound wall will be specified by the applicable drawings. Unless otherwise specified, the tolerance on length and width dimensions will be $-0, +0.25$ in. The Contractor is responsible for adjusting supporting elements to accommodate chosen fiberglass sound wall dimensions. Adjustments to supporting elements shall be reflected in applicable shop drawings submitted for approval. No additional payment will be made for these adjustments.

3.3. PERFORMANCE CRITERIA

3.3.1. **Wind Loads.** The maximum elastic deflection, d_{max} , under the design wind load will be less than 3 in. When a load factor of 1.5 is applied to the design wind load:

- a. the panels will not show any symptoms of failure such as buckling or cracks; and
- b. the panels will not become detached from their supports or fittings.

3.3.2. **Sound Wall Finish.** The sound wall exterior will provide excellent resistance to corrosion, chemical abrasion, and weathering.

3.3.3. **Temperature Resistance.** The sound wall will not exhibit any cracking, deformation, or separation at temperatures ranging from -30°F to 200°F .

3.3.4. **UV Resistance.** The sound wall will be comprised of UV resistant material or UV resistant polymer coating.

3.3.5. **Flame Resistance.** The structural planks will have a maximum flame spread index of 25 or less per ASTM E-84.

3.4. SOURCES

Fibergrate Composite Structures, Inc
5151 Belt Line Road, Suite 700
Dallas, TX 75254
(800) 527-4043

Carsonite Composites
19845 US Highway 76
Newberry, South Carolina 29108
(800) 648-7916

Or an approved equal meeting the requirements of this specification.

Manufacturers must have a minimum 5 yr. history of producing sound barrier assemblies for highway sound barriers.

4. CONSTRUCTION METHODS

Install fiberglass sound wall system in accordance with manufacturers' recommendations or as directed.

5. MEASUREMENT

This Item will be measured by the square foot of the front surface area of the sound wall, complete in place, from the bottom of the wall to the top of the wall.

6. PAYMENT

The work performed and the materials furnished, in accordance with this Item and measured as provided under "Measurement," will be paid for at the unit price bid for "Fiberglass Sound Wall." This price will be full compensation for furnishing and installing the entire fiberglass sound wall assembly including framing, welding, fasteners, hardware, all labor, equipment, and incidentals necessary to complete the work.