

# Special Specification 4185

## Composite Rubber Sound Wall



### 1. DESCRIPTION

Furnish the materials and construct Composite Rubber Sound Walls as shown on the plans and required by this item.

### 2. MATERIALS

Conform to the pertinent requirements of the following standard specification items:

- Item 416, "Drilled Shaft Foundations"
- Item 420, "Concrete Substructures"
- Item 421, "Hydraulic Cement Concrete"
- Item 440, "Reinforcement for Concrete"
- Item 441, "Steel Structures,"
- Item 442, "Metal for Structures"
- Item 445, "Galvanizing"
- Item 446, "Field Cleaning and Painting Steel"
- Item 449, "Anchor Bolts."

Use materials conforming to the pertinent requirements of the following.

ASTM Standards (See Table 1 for requirements):

- E 90, E 795, C 423 – Sound Absorption,
- E 413 – 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),
- E 162 – Surface Flammability,
- D 2240 – Density Hardness,
- B 117 – Corrosion resistance, and
- D 790 – Test Methods for Flexural Strength.

The composite rubber sound wall must consist of stacked tongue and groove sound wall panels. The sound wall panels must be comprised of recycled rubber crumb from recycled tires and urethane resin binder. The rubber crumb must be made from recycled tires at No. 8 mesh size (2.36 mm, 0.093 in.). The recycled rubber and urethane resin binder must be molded with 2" x 6" timber rails as reinforcement. The aesthetic surface pattern and color must be as directed.

The structural components of the system must 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1992 & 2002 amendments, of the AASHTO Guide Specification for Structural Design of Sound Barriers except as superseded by the 2017 AASHTO LRFD Bridge Design Specification, 8<sup>th</sup> Edition. Should a conflict between these specifications occur, the 2017 AASHTO LRFD Bridge Design Specification, will control.

Provide joint fillers, grout, and other incidental materials as shown on the plans or as directed.

Materials must conform to applicable design drawings.

Provide Class "C" Concrete for cast-in-place for the drilled shaft foundations.

Provide douglas fir lumber Select Structural grade (SS) for formed sound wall panel reinforcement.

The composite rubber sound barrier must meet the performance requirements of Table 1 when tested in accordance with the associated ASTM methods.

Table 1

Property	Requirement	Test Method
Sound Transmission Class (STC)	37	ASTM E90 & E413
Flame Resistance	110	ASTM E162
Density Hardness	Type A 63	ASTM D2240
Salt Spray Corrosion Resistance	No Stain or residue 24hr test	ASTM B117

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### 3. GENERAL

Furnish a proprietary composite rubber sound wall in accordance with the plans and this specification.

- 3.1. **Dimensions.** Dimensions of the sound wall must be as specified in the plans. Unless otherwise specified, the tolerance on length and width dimensions must be -0, +0.25 in.
- 3.2. **PERFORMANCE CRITERIA**
- 3.2.1. **Sound Transmission.** Ensure the sound wall system meets or exceed sound transmission loss of 35 decibel (dB). The sound wall must meet sound transmission class STC 37.
- 3.2.2. **Density Hardness.** Ensure the sound wall panel meets ASTM D2240 Type A presser foot to 60 Duro.
- 3.2.3. **Wind Loads.** Sound wall panel must have a maximum deflection (dmax), under the design wind load of less than 0.5 inches, with a design wind load factor of 1.5 applied for a minimum wind design velocity of 90 mph.
- 3.2.4. **Temperature Resistance.** R value of 2.20 per 1 in of thickness of sound wall panels.
- 3.2.5. **Weather & UV Resistance.** Ensure the sound wall system exterior provides resistance to chemical, calcium and salt corrosion, abrasion and weathering. The sound wall panels must be tested for 200 hrs. of UV – ASTM C217/C217M-20 with no change after 2 yrs. Urethane binder must have UV inhibitors.
- 3.2.6. **Flame Resistance.** Ensure the sound wall panels meet ANSI Z124.1 and Z124.2 Appendix III requirement for an average DM of 450 or less.

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### 4. CONSTRUCTION

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

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### 5. MEASUREMENT

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

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### 6. PAYMENT

The work performed and material furnished in accordance with this Item and measured as provided for under "Measurement" will be paid for at the unit price bid for "Composite Rubber Sound Wall." This price is full compensation for furnishing and installing sound wall materials including drilled shaft foundations; anchorage into the supporting members; excavation and backfill; sound wall preparation, hauling and erection; and for labor, tools, testing, equipment, appurtenances and incidentals and all materials furnished as outlined and detailed in the plan notes, specifications and associated drawings for a complete in-place Composite Rubber Sound Wall.