

## **ITEM 203.0395 05 - EXPANDED POLYSTYRENE FILL**

### **DESCRIPTION**

Furnish and install Expanded Polystyrene fill (EPS) to the lines, grades, and thicknesses shown on the plans or as directed in writing by the Engineer.

### **MATERIALS**

#### **General**

Furnish EPS blocks of the dimensions shown on the plans or as approved by the Engineer. EPS is typically supplied as right rectangular prismoid blocks with nominal dimensions of 0.6 m x 1.2 m x 2.4 m. Blocks shall have a flatness, squareness and dimensional tolerance of  $\pm 0.5\%$ . Blocks shall be manufactured using a modified resin that contains a fire retardant additive. Blocks shall be seasoned by storing them at the manufacturer's facility in normal ambient room temperature for a minimum of 72 hours after being released from the mold. Blocks shall meet the following physical requirements after seasoning:

#### **MINIMUM PHYSICAL PROPERTIES**

ASTM D1622	Density	0.2 kN/m <sup>3</sup>
ASTM D1621	Compressive Strength:	
	at 1% deformation	40 kPa
	at 10% deformation	110 kPa
ASTM C203	Flexural Strength	207 kPa
ASTM D2863	Flammability (Oxygen Index)	24.0 %

The following reference standards shall apply in whole or in part to material supplied under this specification:

#### **APPLICABLE STANDARDS**

ASTM D6817	Standard Specification for Rigid Cellular Polystyrene Geofoam
ASTM C390	Criteria for Sampling and Acceptance of Preformed Thermal Insulation Lots

The EPS blocks shall be produced by a manufacturer with an in-place quality control program which is monitored and certified by an accredited, independent third-party testing organization.

#### **Submittals**

Submit certified third-party test reports showing that at least two separately molded EPS blocks, representative of those which will be supplied to the project, conform to the physical properties and standards listed above. The date of manufacture of the tested EPS blocks shall be no more than 6 months prior to the date of the submittal. Test specimen selection and preparation shall be done in accordance with the relevant ASTM standard and the appropriate Departmental publication in effect on the date of the advertisement for bids. The publication is available upon request to the Regional Director or the Director, Geotechnical Engineering Bureau.

Submit detailed manufacturing records for the tested blocks which clearly state, in part, the percentage, type (in-plant or post-consumer), and original density of any recycled EPS material (regrind) used in the molding process.

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The Deputy Chief Engineer for Technical Services (DCETS) will require 20 working days to review the submission. Perform no work prior to the DCETS's approval.

### **Basis of Acceptance**

Each EPS block shall be labeled with the manufacturer's name, product type, lot number, date of manufacture and weight (as measured after seasoning and trimming). The manufacturer shall supply detailed manufacturing records of individual blocks if requested by the Engineer.

The Engineer will perform on-site density tests by weighing and measuring one block randomly chosen from each truckload or  $75 \pm$  cubic meters of EPS delivered to the project site. The Contractor shall provide a calibrated scale accurate to within 0.05 kg and with sufficient capacity for this purpose. Blocks shall be kept clean and dry prior to weighing. If any block does not meet the minimum density requirement, the sampled truckload or  $75 \pm$  cubic meters batch will be rejected in writing by the Engineer.

EPS blocks that do not meet tolerances, or have side area surface damage of 20% or more or volume damage of 1% or more will be rejected.

The State reserves the right to take random samples from the project site (not to exceed 1 block per 285 cubic meters) for additional quality assurance testing. If testing yields unsatisfactory results the Contractor may be directed to remove and replace potentially defective EPS blocks at no additional cost to the State.

## **CONSTRUCTION DETAILS**

### **General**

Exercise care to prevent damage to the EPS during delivery, storage and construction. Protect the EPS blocks from (1) Organic solvents such as acetone, benzene, and paint thinner; (2) Petroleum based solvents such as gasoline and diesel fuel; (3) Open flames and (4) Prolonged exposure to sunlight (no more than 30 days).

Provide temporary weights or tie downs to anchor the EPS blocks if there is wind gust or flooding potential.

Do not drive or operate heavy machinery or place concentrated loads directly on the EPS blocks. EPS blocks damaged due to the Contractor's operations will be removed and replaced at no additional cost to the State.

### **Installation**

Grade the leveling course within a tolerance of 13 mm in 3 meters. Place the EPS blocks as indicated on the plans. Fit blocks tight and flush against adjacent blocks on all sides. Avoid continuous vertical joints by laying blocks in a running bond pattern and orienting the long axis of each successive layer of blocks perpendicular to the long axis of the previous layer.

Trim the EPS blocks in the field where necessary with a portable hot wire device supplied by the manufacturer, or a handsaw, or an alternative cutting method approved by the Engineer.

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**METHOD OF MEASUREMENT**

The quantity of Expanded Polystyrene fill is the number of cubic meters satisfactorily installed as measured in its final position.

**BASIS OF PAYMENT**

The unit price per cubic meter includes the cost of labor, materials, incidentals and equipment necessary to satisfactorily construct the Expanded Polystyrene fill.

**DISAPPROVED BY EI 08-014**