

**CALIFORNIA BUILDING STANDARDS COMMISSION  
GREEN BUILDING  
WORKSHOP  
Agenda Item 5j**

**DRAFT EXPRESS TERMS for the 2016  
CALIFORNIA GREEN BUILDING STANDARDS CODE,  
(CALGreen), PART 11,  
CALIFORNIA BUILDING STANDARDS CODE,  
TITLE 24, CALIFORNIA CODE OF REGULATIONS**

- **Proposed code language for the 2015 Triennial Code Adoption Cycle**  
LEGEND FOR EXPRESS TERMS
  1. New California amendments: All such language appears *underlined and in italics*.
  2. Repealed text: All such language appears in ~~strikeout~~.  
*[Information for the reader is bracketed and in red italics]*

**Recycled Content**

- **Statement of specific purpose, problem, rationale and benefits:**

The California Department of Resources Recycling and Recovery (CalRecycle) is proposing to 1) make the existing Tier 1 Requirements of A5.405.4 mandatory by adding them to Section 5.405.4; 2) adding a prescriptive approach to the Recycled Content materials in section 5.405.4; 3) increasing the Tier 1 and 2 requirements to 15% and 20% respectively; 4) removing the prohibition counting structural materials from counting, and 5) requiring that recycled content materials that are labeled as neither post- nor pre-consumer content now be counted as pre-consumer rather than half post-consumer/ half preconsumer.

**History:**

CalRecycle is proposing a strategy to make mandatory the use of recycled content materials and to simplify and encourage greater use of recycled content (RC) materials. AB 341 (Chapter 476, Statutes of 2011) set California's statewide recycling goal at 75%, and directed CalRecycle to propose statewide strategies to assist in meeting that goal. Increasing demand for recycled content materials provides markets for materials collected as a result of AB 341 programs. Increasing the purchase of recycled content materials such as latex paint and nylon carpet also support the efforts of the state's carpet and paint stewardship programs. Furthermore, the use of recycled content materials in place of virgin materials results in significant greenhouse gas emission reductions; consequently, such use is a key policy goal in the Air Resource Board's 2014 Updated Scoping Plan.

**Rationale for proposed code change:**

Making the use of RC materials mandatory will provide markets for materials collected under AB 341, 75% statewide recycling goal. Adding a prescriptive approach will compliment and simplify the existing performance approach currently in section 5.405.4. By simplifying this section, compliance will be more likely and thus increase demand for recycled content materials and, consequently, reduce emissions of greenhouse gases. Allowing structural materials to count will allow compliance for many industry standard practices. Changing the way non-designated recycled content materials count will remove the incentive for manufacturers to simply designate pre-consumer materials as recycled content to allow the benefits of being counted as partially containing post-consumer. This change will assist the markets for post-consumer materials collected as part of increased diversion programs.

**Section 5.405**  
**MATERIAL SOURCES**

**5.405.4 Recycled content.** *Use materials, equivalent in performance to virgin materials with a total (combined) recycled content value (RCV) of not be less than 10 percent of the total material cost of the project, or use 3 products from the Collaborative for High Performance School's (CHPS) Minimum Recycled Content Levels list for a majority of all products in that category in the project. [Table 24 CA CHPS Criteria (2014)]*

**Required Total RCV (dollars) = Total Material Cost (dollars) × 10 percent (Equation 5.4-1)**

**Notes:**

1. Sample forms which allow user input and automatic calculation are located at [www.hcd.ca.gov/CALGreen.html](http://www.hcd.ca.gov/CALGreen.html) and may be used to simplify documenting compliance with this section and for calculating recycled content value of materials or assembly products.
2. Sources and recycled content of some recycled materials can be obtained from CalRecycle if not provided by the manufacturer.

**5.405.4.1 Total material cost.** *Total material cost is the total estimated or actual cost of materials and assembly products used in the project. The required total recycled content value for the project (in dollars) shall be determined by Equation 5.4-1.*

Total material cost shall be calculated by using one of the methods specified below:

1. **Simplified method.** To obtain the total cost of the project multiply the square footage of the structure by the square foot valuation established by the enforcing agency. The total material cost is 45 percent of the total cost of the project. Use Equations A5.4-3A or A5.4-3B to determine total material costs using the simplified method.

Total material costs = Project square footage × square foot valuation × 45 percent (Equation 5.4-3A)

Total estimated or actual cost of project × 45 percent (Equation 5.4-3B)

2. **Detailed method.** To obtain the total cost of the project, add the estimated and/or actual costs of materials used for the project including the structure (steel, concrete, wood or masonry); the enclosure (roof, windows, doors and exterior walls); the interior walls, ceilings and finishes (gypsum board, ceiling tiles, etc.). The total estimated and/or actual costs shall not include fees, labor and installation costs, overhead, appliances, equipment, furniture or furnishings.

**5.405.4.2 Determination of total recycled content value (RCV).** *Total RCV may be determined either by dollars or percentage as noted below.*

1. **Total recycled content value for the project (in dollars).** This is the sum of the recycled content value of the materials and/or assemblies considered and shall be determined by Equation 5.4-4. The result of this calculation may be directly compared to Equations 5.4-1 and 5.4-2 to determine compliance.

Total Recycled Content Value (dollars) = (RCV<sub>M</sub> + RCV<sub>A</sub>) (Equation 5.4-4)

2. **Total recycled content value for the project (by percentage).** This is expressed as a percentage of the total material cost and shall be determined by Equations 5.4-4 and 5.4-5. The result of this calculation may be directly compared for compliance.

**Total Recycled Content Value (percent) = [Total Recycled Content Value (dollars) ÷ Total Material Cost (dollars)] × 100 (Equation 5.4-5)**

**5.405.4.3 Determination of recycled content value of materials (RCV<sub>M</sub>).** The recycled content value of each material (RCV<sub>M</sub>) is calculated by multiplying the cost of material, as defined by the recycled content. See Equations 5.4-6 and 5.4-7.

**RCV<sub>M</sub> (dollars) = Material cost (dollars) × RC<sub>M</sub> (percent) (Equation 5.4-6)**

**RC<sub>M</sub> (percent) = Postconsumer content percentage + (1/2) Preconsumer content percentage (Equation 5.4-7)**

**Notes:**

1. If the postconsumer and preconsumer recycled content is provided in pounds, Equation 5.4-7 may be used, but the final result (in pounds) must be multiplied by 100 to show RC<sub>M</sub> as a percentage.
2. If the manufacturer does not separately identify the preconsumer and postconsumer recycled content of a material but reports it as a total single percentage, the total amount shall be considered preconsumer recycled material.

**5.405.4.4 Determination of recycled content value of assemblies – (RCV<sub>A</sub>).** Recycled content value of assemblies is calculated by multiplying the total cost of assembly by the total recycled content of the assembly (RC<sub>A</sub>), and shall be determined by Equation 5.4-8.

**RCV<sub>A</sub> (dollars) = Assembly cost (dollars) × Total RC<sub>A</sub> (percent) (Equation 5.4.8)**

If not provided by the manufacturer, Total RC<sub>A</sub> (percent) is the sum (Σ) of the Proportional Recycled Content (PRCM) of each material in the assembly. RC<sub>A</sub> shall be determined by Equation 5.4-9.

**RC<sub>A</sub> = Σ PRC<sub>M</sub> (Equation 5.4-9)**

PRC<sub>M</sub> of each material may be calculated by one of two methods using the following formulas:

**Method 1: Recycled content (Postconsumer and Preconsumer) of each material provided in percentages**

**PRC<sub>M</sub> (percent) = Weight of material (percent) × RC<sub>M</sub> (percent) (Equation 5.4-10)**

**Weight of material (percent) = [Weight of material (lbs) ÷ Weight of assembly (lbs)] × 100 (Equation 5.4-11)**

**RC<sub>M</sub> (percent) = Postconsumer content percentage + (1/2) Preconsumer content percentage (See Equation 5.4-7)**

**Method 2: Recycled content (Postconsumer and Preconsumer) provided in pounds**

**PRC<sub>M</sub> (percent) = [RC<sub>M</sub> (lbs) Weight of material (lbs)] × 100 (Equation 5.4-12)**

$$RC_M (\text{lbs}) = \text{Postconsumer content (lbs)} + (1/2) \text{ Preconsumer content (lbs)}$$

**(Equation 5.4-13)**

**Note:** If the manufacturer does not separately identify the preconsumer and postconsumer recycled content of a material but reports it as a total single percentage, the total amount shall be considered preconsumer recycled material.

**5.405.4.5 Alternate method for concrete.** When Supplementary Cementitious Materials (SCMs), such as fly ash or ground blast furnace slag cement, are used in concrete, an alternate method of calculating and reporting recycled content in concrete products shall be permitted. When determining the recycled content value, the percent recycled content shall be multiplied by the cost of the cementitious materials only, not the total cost of the concrete.

#### **A5.405.4 Recycled content**

**A5.405.4 Recycled content.** Use materials, equivalent in performance to virgin materials with a total (combined) recycled content value (RCV) of:

**Tier 1 [BSC]. Recycled content.** The RCV shall not be less than ~~40~~ 15 percent of the total material cost of the project, or use 4 products from the Collaborative for High Performance School's (CHPS) Minimum Recycled Content Levels list for a majority of all products in that category in the project. [\[Table 24 CA CHPS Criteria \(2014\)\]](#)

$$\text{Required Total RCV (dollars)} = \text{Total Material Cost (dollars)} \times \del{40} \u{15} \text{ percent (Equation A5. 4-1)}$$

**Tier 2 [BSC].** The RCV shall not be less than ~~45~~ 20 percent of the total material cost of the project, or use 8 products from the Collaborative for High Performance School's (CHPS) Minimum Recycled Content Levels list for a majority of all products in that category in the project. [\[Table 24 CA CHPS Criteria \(2014\)\]](#)

$$\text{Required Total RCV (dollars)} = \text{Total Material Cost (dollars)} \times \del{45} \u{20} \text{ percent (Equation A5. 4-2),}$$

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**A5.405.4.3 Determination of recycled content value of materials (RCV<sub>M</sub>).** The recycled content value of each material (RCV<sub>M</sub>) is calculated by multiplying the cost of material, as defined by the recycled content. See Equations A5.4-6 and A5.4-7.

$$RCV_M (\text{dollars}) = \text{Material cost (dollars)} \times RC_M (\text{percent}) \text{ (Equation A5.4-6)}$$

$$RC_M (\text{percent}) = \text{Postconsumer content percentage} + (1/2) \text{ Preconsumer content percentage}$$

**(Equation A5.4-7)**

**Notes:**

1. If the postconsumer and preconsumer recycled content is provided in pounds, Equation A5.4-7 may be used, but the final result (in pounds) must be multiplied by 100 to show RC<sub>M</sub> as a percentage.
2. If the manufacturer does not separately identify the preconsumer and postconsumer recycled content of a material but reports it as a total single percentage, ~~one half of~~

the total amount shall be considered preconsumer ~~and one half shall be considered postconsumer~~ recycled material.

**A5.405.4.4 Determination of recycled content value of assemblies – (RCV<sub>A</sub>).** Recycled content value of assemblies is calculated by multiplying the total cost of assembly by the total recycled content of the assembly (RC<sub>A</sub>), and shall be determined by Equation A5.4-8.

$$RCV_A \text{ (dollars)} = \text{Assembly cost (dollars)} \times \text{Total } RC_A \text{ (percent)} \quad \textbf{(Equation A5.4.8)}$$

If not provided by the manufacturer, Total <sub>RCA</sub> (percent) is the sum ( $\Sigma$ ) of the Proportional Recycled Content (PRCM) of each material in the assembly. RC<sub>A</sub> shall be determined by Equation A5.4-9.

$$RC_A = \Sigma PRC_M \quad \textbf{(Equation A5.4-9)}$$

PRC<sub>M</sub> of each material may be calculated by one of two methods using the following formulas:

**Method 1:** Recycled content (Postconsumer and Preconsumer) of each material provided in percentages

$$PRC_M \text{ (percent)} = \text{Weight of material (percent)} \times RC_M \text{ (percent)} \quad \textbf{(Equation A5.4-10)}$$

$$\text{Weight of material (percent)} = [\text{Weight of material (lbs)} \div \text{Weight of assembly (lbs)}] \times 100 \quad \textbf{(Equation A5.4-11)}$$

$$RC_M \text{ (percent)} = \text{Postconsumer content percentage} + (1/2) \text{ Preconsumer content percentage} \quad \textbf{(See Equation A5.4-7)}$$

**Method 2:** Recycled content (Postconsumer and Preconsumer) provided in pounds

$$PRC_M \text{ (percent)} = [RC_M \text{ (lbs)} \text{ Weight of material (lbs)}] \times 100 \quad \textbf{(Equation A5.4-12)}$$

$$RC_M \text{ (lbs)} = \text{Postconsumer content (lbs)} + (1/2) \text{ Preconsumer content (lbs)} \quad \textbf{(Equation A5.4-13)}$$

**Note:** If the manufacturer does not separately identify the preconsumer and postconsumer recycled content of a material but reports it as a total single percentage, ~~one half of the total amount~~ shall be considered preconsumer ~~and one half shall be considered postconsumer~~ recycled material.

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