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ESR-3168

Reissued 02/2017

This report is subject to renewal 02/2019.

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES

SECTION: 06 50 00—STRUCTURAL PLASTICS

SECTION: 06 53 00—PLASTIC DECKING

REPORT HOLDER:

TREX COMPANY, INC.

**160 EXETER DRIVE
WINCHESTER, VIRGINIA 22602**

EVALUATION SUBJECT:

TREX® ENHANCE®, TRANSCEND®, AND SELECT® DECKING



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ICC-ES Evaluation Report

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES

Section: 06 50 00—Structural Plastics

Section: 06 53 00—Plastic Decking

REPORT HOLDER:

TREX COMPANY, INC.
160 EXETER DRIVE
WINCHESTER, VIRGINIA 22602
(540) 542-6300
www.trex.com

EVALUATION SUBJECT:

TREX® ENHANCE®, TRANSCEND®, AND SELECT® DECKING

1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- 2015, 2012 and 2009 *International Building Code*® (IBC)
- 2015, 2012 and 2009 *International Residential Code*® (IRC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)[†]

[†]The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

Properties evaluated:

- Structural
- Durability
- Surface-burning characteristics

1.2 Evaluation to the following green code(s) and/or standards:

- 2013 California Green Building Standards Code (CALGreen), Title 24, Part 11
- 2012 and 2008 ICC 700 *National Green Building Standard*™ (ICC 700-2012 and ICC 700-2008)

Attributes verified:

See Section 3.1

2.0 USES

Trex® composite Enhance®, Transcend®, and Select® Decking are for use as deck boards (Figure 1) for exterior balconies, porches, decks, stair treads and other exterior walking surfaces of Type V-B (IBC) construction, and in structures constructed in accordance with the IRC. Trex® Enhance®, Transcend® and Select® Fascia Boards

(Figure 2) is for use as nonstructural trim components for exterior balconies, porches and decks of Type V-B (IBC) construction, and in structures constructed in accordance with the IRC.

3.0 DESCRIPTION

3.1 General:

Trex® composite decking is a wood thermoplastic composite lumber (WTCL) deck board and fascia, with an integrated shell that covers the boards on the top surface and sides. The underside of the boards and fascia is not covered by the integrated shell. The integrated shell consists of a proprietary surface formulation that produces a natural, wood-like grain pattern finish. The deck board and fascia are made from approximately 50 percent wood fiber and 50 percent polyethylene by weight, and are alternatives to preservative-treated or naturally durable lumber. Trex® composite decking is manufactured by a continuous extrusion process and is available in various colors, sizes, and textures per each product as described in Sections 3.1.1, 3.1.2, and 3.1.3. The Trex® Hideaway® hidden fastening system (Figure 3) is described in Section 3.1.4.

The attributes of the Trex® composite decking have been verified as conforming to the provisions of (i) CALGreen Section A5.406.1.2 for reduced maintenance; (ii) ICC 700-2012 Section 602.1.6 and 11.602.1.6 for termite-resistance materials and Section 601.7, 11.601.7, and 12.1(A).601.7 for site-applied finishing materials; and (iii) ICC 700-2008 Section 6.2.8 for termite-resistant materials and Section 601.7 for site-applied finishing materials. Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. These codes or standards often provide supplemental information as guidance. See Section 3.2 for limitations on termite-resistance use.

3.1.1 Trex® Enhance Composite Decking: Enhance® decking is available in 3 colors: Beach Dune, Clamshell, and Saddle. Trex® Enhance composite decking has square-edge and grooved-edge profiles. The square-edge deck boards are 1-inch-thick-by-5¹/₂-inch-wide nominal (25 mm by 140 mm) and the grooved-edge deck boards are 1-inch-thick-by-5¹/₂-inch-wide nominal (25 mm by 140 mm). Trex® composite fascia boards are ¾-inch-thick-by-7-¼-inch-wide (17 mm by 184 mm) and ¾-inch-thick-by-11¼-inch-wide (17 mm by 288 mm) profiles.

3.1.2 Trex® Transcend® Composite Decking: Transcend® composite decking is available in ten colors:

Gravel Path, Fire Pit, Vintage Lantern, Tree House, Rope Swing, Spiced Rum, Lava Rock, Island Mist, Havana Gold, and Tiki Torch. Transcend® composite decking has square-edge and grooved-edge profiles. The square-edge deck boards are 1-inch-thick-by-5½-inch-wide nominal (25 mm by 140 mm) or 1⅜-inch-thick-by-5½-inch-wide nominal (33 mm by 140 mm) and the grooved-edge deck boards are 1-inch-thick-by-5½-inch-wide nominal (25 mm by 140 mm). Trex® Transcend® composite fascia boards are ¾-inch-thick-by-7¼-inch-wide (17 mm by 184 mm) and ¾-inch-thick-by-11¼-inch-wide (17 mm by 288 mm) profiles.

3.1.3 Trex® Select® Composite Decking: Select® composite decking is available in 5 colors: Madeira, Pebble Grey, Winchester Grey, Woodland Brown, and Saddle. The Select composite decking has square-edge and grooved-edge profiles. The square-edge deck boards are 1⅝-inch-thick-by-5½-inch-wide nominal (20 mm by 140 mm) or 1⅜-inch-thick-by-5½-inch-wide nominal (33 mm by 140 mm). Grooved-edge deck boards are 1⅝-inch-thick-by-5½-inch nominal (25 mm by 140 mm). The Select® composite fascia are ¾-inch-thick-by-7¼-inch wide (17 mm by 184 mm) and ¾-inch-thick-by-11¼-inch-wide (17 mm by 288 mm) profiles.

3.1.4 Trex® Hideaway® Hidden Fastening System: The hidden fastener system is designed specifically for Trex® composite deck boards having grooved-edges and consists of a stainless steel clip or a plastic universal clip and No. 8 by 2-inch-long (51 mm) stainless steel flathead screw.

3.2 Durability:

When subjected to weathering, insect attack and other decaying elements, the deck board and fascia material are equivalent in durability to preservative-treated or naturally durable lumber. Accordingly, the material is permitted to be used as an alternative to preservative-treated or naturally durable lumber on exterior decks, porches, balconies and stair treads, as applicable. The deck board and fascia have been evaluated for use in ambient air temperatures between -20°F (-29°C) and 125°F (52°C).

3.3 Surface-burning Characteristics:

When tested in accordance with ASTM E84, Trex® composite boards have a flame-spread index no greater than 200.

4.0 DESIGN AND INSTALLATION

4.1 Design: Allowable Stresses:

Table 1 lists allowable stress values only for the Trex® Transcend® decking recognized in this report. These values must not be adjusted.

4.2 Installation:

4.2.1 Deck Boards: The deck boards maybe installed perpendicular or at an angle to the supporting construction, Table 2 lists the maximum spacing for deck boards installed perpendicular or at an angle to the supporting construction.. The deck boards must be spaced at edges and ends in accordance with the manufacturer's published installation instructions.

4.2.2 Deck Boards Used as Stair Treads: The deck boards, when used as stair treads, are sufficient to resist the code-prescribed concentrated load of 300 lbf (1.33 kN) when installed at a maximum center-to-center spacing as indicated in Table 3.

4.2.3 Deck Board Fasteners: Trex® "grooved-edge" boards, when installed perpendicular to the supporting construction with the Trex® Hideaway® Stainless Steel or Universal Hidden Fastener Systems with No. 8 by 2-inch (51 mm) stainless steel flathead screws, have an uplift

rating of 100 psf (4788 Pa) up to a maximum span of 16 inches (406 mm) when installed at each support. Trex® "square-edge" solid boards (no edge groove) are installed with two No. 8 or No. 10 by 2½-inch (63.5 mm) wood screws at ends to each support, at least 1 inch (25.4 mm) from the board end and sides. The allowable fastener head pull-through capacity for the screws is 237 lbf (1054 N) per fastener. Multiple joists or blocking must be used to provide adequate surface for fastener embedment at board ends.

5.0 CONDITIONS OF USE

The Trex® composite deck boards described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1** The Trex® composite decking is limited to exterior use as deck boards for balconies, porches, decks and stair treads of Type V-B (IBC) construction and structures constructed in accordance with the IRC.
- 5.2** The Trex® composite fascia is limited to exterior use as trim for balconies, porches and decks of Type V-B (IBC) construction and structures constructed in accordance with the IRC.
- 5.3** Installation must comply with this report, the manufacturer's published instructions and the applicable code. When the manufacturer's published installation instructions differ from this report, this report governs.
- 5.4** The use of the Trex® composite decking and fascia as a component of a fire-resistance-rated assembly is outside the scope of this report.
- 5.5** The compatibility of the fasteners with the supporting construction, including chemically treated wood, is outside the scope of this report.
- 5.6** The deck boards must be directly fastened to supporting construction. Where required by the code official, engineering calculations and construction documents consistent with this report must be submitted for approval. The calculations must verify that the supporting construction complies with the applicable building code requirements and is adequate to resist the loads imparted upon it from the products and systems discussed in this report. The documents must contain details of the attachment to the supporting structure consistent with the requirements of this report. The documents must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.7** The Trex® composite decking board and fascia are produced in Winchester, Virginia, and Fernley, Nevada, under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

- 6.1** Data in accordance with applicable portions of the ICC-ES Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (AC174), dated January 2012 (editorially revised December 2014).
- 6.2** Test data in accordance with ASTM D7031 for bending, compressive stress parallel to longitudinal direction (F_c), compressive stress perpendicular to longitudinal direction ($F_{c\perp}$) and shear stress (F_v).

7.0 IDENTIFICATION

The deck board and fascia board described in this report must be identified by a label on the packaging bearing the Trex Company, Inc., name and address, the product name and the evaluation report number (ESR-3168).

TABLE 1—ALLOWABLE DESIGN STRESS VALUES ONLY FOR TREX® TRANSCEND® SOLID AND GROOVED-EDGE DECKING

PROPERTY	ALLOWABLE DESIGN VALUE (psi)
Flexural stress (F_b) ¹	500
Modulus of Elasticity (E) ¹	200,000
Compressive stress parallel to longitudinal direction (F_c) ²	540
Compressive stress perpendicular to longitudinal direction ($F_{c\perp}$) ²	540
Shear stress (F_v) ²	360

For **SI**: 1 psi = 6.9 kPa.

¹Values are based on testing for flatwise bending.

²Values are based on testing to ASTM D7031.

TABLE 2—DECK BOARD SPAN RATING

DECK BOARD	ANGLE WITH RESPECT TO JOIST (degrees)	MAXIMUM SPAN ¹ (inches)	ALLOWABLE CAPACITY ² (lb/ft ²)
Enhance® 1-by-5.5 Solid	30	8	100
Enhance® 1-by-5.5 Solid	45	12	100
Enhance® 1-by-5.5 Solid	60	14	100
Enhance® 1-by-5.5 Solid	90	16	100
Enhance® 1-by-5.5 Grooved-edge	30	8	100
Enhance® 1-by-5.5 Grooved-edge	45	12	100
Enhance® 1-by-5.5 Grooved-edge	60	14	100
Enhance® 1-by-5.5 Grooved-edge	90	16	100
Transcend® 1-by-5.5 Solid	30	8	100
Transcend® 1-by-5.5 Solid	45	12	100
Transcend® 1-by-5.5 Solid	60	16	100
Transcend® 1-by-5.5 Solid	90	24	100
Transcend® 1-by-5.5 Grooved-edge	30	8	100
Transcend® 1-by-5.5 Grooved-edge	45	12	100
Transcend® 1-by-5.5 Grooved-edge	60	14	100
Transcend® 1-by-5.5 Grooved-edge	90	16	100
Transcend® 1 ³ / ₈ -by-5.5 Solid	30	8	100
Transcend® 1 ³ / ₈ -by-5.5 Solid	45	12	100
Transcend® 1 ³ / ₈ -by-5.5 Solid	60	16	100
Transcend® 1 ³ / ₈ -by-5.5 Solid	90	24	100
Select® 1 ⁵ / ₁₆ -by-5.5 Solid	30	8	100
Select® 1 ⁵ / ₁₆ -by-5.5 Solid	45	12	100
Select® 1 ⁵ / ₁₆ -by-5.5 Solid	60	14	100
Select® 1 ⁵ / ₁₆ -by-5.5 Solid	90	16	100
Select® 1 ⁵ / ₁₆ -by-5.5 Grooved-edge	30	8	100
Select® 1 ⁵ / ₁₆ -by-5.5 Grooved-edge	45	12	100
Select® 1 ⁵ / ₁₆ -by-5.5 Grooved-edge	60	14	100
Select® 1 ⁵ / ₁₆ -by-5.5 Grooved-edge	90	16	100
Select® 1 ³ / ₈ -by-5.5 Solid	30	8	100
Select® 1 ³ / ₈ -by-5.5 Solid	45	12	100
Select® 1 ³ / ₈ -by-5.5 Solid	60	14	100
Select® 1 ³ / ₈ -by-5.5 Solid	90	16	100

For **SI**: 1 inch = 25.4 mm; 1 lb/ft² = 47.9 Pa.

¹Maximum span is measured center-to-center of the supporting construction.

²Maximum allowable capacity is adjusted for durability. No further increases are permitted.

TABLE 3—MAXIMUM STAIR TREAD SPANS²

DECK BOARD	MAXIMUM SPAN (inches) ¹
Enhance 1-by-5.5 Solid	12
Enhance 1-by-5.5 Grooved-edge	12
Transcend® 1-by-5.5 Solid	12
Transcend® 1 ³ / ₈ -by-5.5 Solid	12
Transcend® 1-by-5.5 Grooved-edge	12
Select® 1 ⁵ / ₁₆ -by-5.5 Solid	9
Select® 1 ⁵ / ₁₆ -by-5.5 Grooved-edge	9
Select® 1 ³ / ₈ -by-5.5 Solid	12

For **SI**: 1 inch = 25.4 mm; 1 lb/ft² = 47.9 Pa.
¹Maximum span is measured center-to-center of the supporting construction.
²Based on a minimum two-span installation.

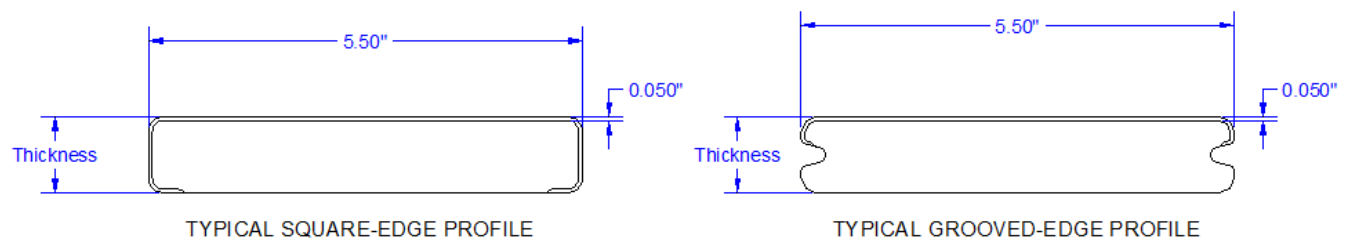


FIGURE 1—TYPICAL TREX® DECK BOARD PROFILES

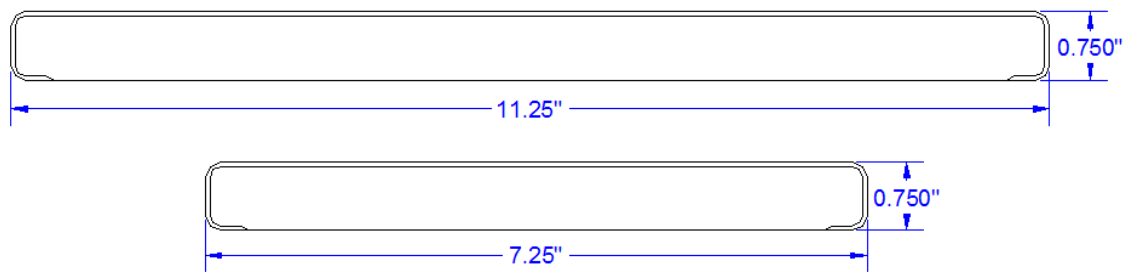


FIGURE 2—TREX® FASCIA PROFILES

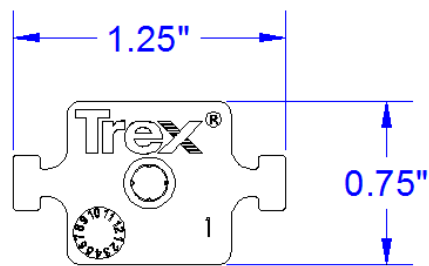


FIGURE 3—HIDDEN FASTENER PROFILE

For **SI**: 1 inch = 25.4 mm.

ICC-ES VAR Environmental Report

VAR-1011

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES

Section: 06 53 00—Plastic Decking

Section: 06 63 00—Plastic Railings

REPORT HOLDER:

TREX COMPANY, INC.
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WINCHESTER, VIRGINIA 22602
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www.Trex.com

EVALUATION SUBJECT:

Trex Transcend™ Decking and Trex Transcend™ Fascia: 1x8 and 1x12

1.0 EVALUATION SCOPE

Compliance with the following evaluation guidelines:

- ICC-ES Environmental Criteria for Determination of Recycled Content of Materials (EC101), dated March 1, 2012.
- ICC-ES Environmental Criteria for Determination of Bio-based Material Content (EC102), dated March 1, 2012.

Compliance eligibility with the applicable sections of the following green building rating systems, standards and codes:

- National Green Building Standard (ICC 700-2008) (see Table 4 for details)
- LEED for Homes 2008 (see Table 5 for details)
- LEED 2009 for New Construction and Major Renovations (see Table 6 for details)
- 2010 California Green Building Standards Code (CALGreen), Title 24, Part 11 (see Table 7 for details)

2.0 USES

Trex® Transcend is used for a variety of exterior applications, including nonstructural trim and deck boards and guardrail assemblies for balconies, porches and exterior walking surfaces.

3.0 DESCRIPTION

Trex® products are wood thermoplastic composite lumber (WTCL) made from a blend of wood and polyethylene. The products are manufactured in a variety of sizes, profiles, textures and colors.

4.0 CONDITIONS

4.1 Code Compliance:

The Trex Transcend™ Decking and Trex Transcend™ Fascia: 1x8 and 1x12 have been evaluated for compliance with the requirements of the International Codes as listed in Table 3 of this report.

4.2 Green Rating Systems, Standards and Code Eligibility:

The information presented in Tables 4 through 7 of this report provides a matrix of areas of evaluation and corresponding limitations and/or additional project-specific requirements, and offers benefits to individuals who are assessing eligibility for credits or points.

The final interpretation of the specific requirements of the respective green building rating system and/or standard rests with the developer of that specific rating system or standard or the AHJ, as applicable.

Compliance for items noted as “Verified Attribute” is subject to any conditions noted in the tables. Decisions on compliance for those items noted as “Eligible for Points” in Tables 4 through 7 rest with the user of this report, and those items are subject to the conditions noted. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. Rating systems or standards often provide supplemental information as guidance.

5.0 BASIS OF EVALUATION

The information in this report, including the “Verified Attribute,” is based upon the following supporting documentation:

- 5.1** ICC-ES EC101. [Evaluation applies to ICC 700 Section 604.1; LEED Homes MR Credit 2.2; LEED NC MR Credit 4; CALGreen Section A4.405.3 & A5.504.4].
- 5.2** ICC-ES EC102. [Evaluation applies to ICC 700 Section 606.1(2)].
- 5.3** Evidence of compliance with termite resistance in accordance with Section 4.4 of the ICC-ES Acceptance Criteria for Thermoplastic Composite Wood Products (AC109) or Section 3.9 of the ICC-ES Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (Guards and Handrails) (AC174). [Evaluation applies to ICC 700 Section 602.8.]

6.0 IDENTIFICATION

Trex products are identified with a stamp noting the manufacturer's name (Trex) and address, the product name, the manufacturing location, the ICC-ES evaluation report number (if applicable), and the name or logo of the

inspection or grading agency. The report subjects are also identified on the product and/or packaging with the VAR Environmental Report number (VAR-1011) and the ICC-ES SAVE Mark, as applicable.

TABLE 1—RECYCLED CONTENT BY WEIGHT SUMMARY

PRODUCT NAME	RECYCLED MATERIALS	% PRE-CONSUMER RECYCLED CONTENT	% POST-CONSUMER RECYCLED CONTENT	% TOTAL RECYCLED CONTENT
Trex Transcend™ Decking Trex Transcend™ Fascia: 1x8 & 1x12	Wood	47.70	0	95.40
	Polyethylene	16.70	31.00	

TABLE 2—BIOBASED MATERIAL CONTENT SUMMARY

PRODUCT	MINIMUM % BIOBASED CONTENT	METHOD OF DETERMINATION
Trex Transcend™ Decking Trex Transcend™ Fascia: 1x8 & 1x12	40%	Calculation

TABLE 3—ICC-ES EVALUATION REPORT NUMBER FOR TREX PRODUCTS

PRODUCT	REPORT NUMBER
Trex Transcend™ Decking Trex Transcend™ Fascia: 1x8 and 1x12	ESR-3168

TABLES 4 THROUGH 7

Section Number	Section Intent	Possible Points	Conditions of Use to Qualify for Points	Trex Transcend™ Decking Trex Transcend™ Fascia: 1x8 & 1x12
TABLE 4—SUMMARY OF AREAS OF ELIGIBILITY WITH THE NATIONAL GREEN BUILDING STANDARD (ICC 700-2008)				
602.8	Termite-resistant materials are used.	6 max	To earn 6 points all structural elements must be termite resistant in areas of heavy termite infestation. 2 or 4 points are available for areas with lower infestation probability.	●
604.1	Use two or more major and/or minor building materials containing recycled content.	2 6 max	2, 4 or 6 points may be earned when products are used with another major building component with recycled content of 25% < 50%; 50% < 75%; ≥ 75%, respectively.	●
606.1(2)	Two types of biobased materials are used, each for more than 1 percent of the project's projected building material cost.	6	To earn 6 points two types of bio-based products must be used and the cost of each must be more than 1% of the projects projected building material cost.	●
903.4.1(3)	The moisture content of lumber is sampled to ensure it does not exceed 19 percent prior to the surface and/or wall cavity exposure.	4	To earn 4 points the moisture content of lumber must be determined to not exceed 19%, such as measuring with a moisture meter, prior to enclosure.	○
TABLE 5—SUMMARY OF AREAS OF ELIGIBILITY WITH USGBC'S LEED FOR HOMES 2008				
MR 2.2	Recycled content.	0.5	To earn 0.5 point use materials with recycled content such that the sum of postconsumer recycled content plus $\frac{1}{2}$ the post industrial (preconsumer) content constitutes a minimum total recycled content of 25%.	●
TABLE 6—SUMMARY OF AREAS OF ELIGIBILITY WITH USGBC'S LEED 2009 FOR NEW CONSTRUCTION AND MAJOR RENOVATIONS				
MR4	Recycled content.	1 2 max	To earn 1 point use materials with recycled content such that the sum of postconsumer recycled content plus $\frac{1}{2}$ of the preconsumer content constitutes at least 10%, based on the cost, of the total value of the materials in the project. To earn 2 points use 20% or more.	●
TABLE 7—SUMMARY OF AREAS OF ELIGIBILITY WITH 2010 CALIFORNIA GREEN BUILDING STANDARDS CODE				
A4.405.3 A5.405.4	Recycled content.	N/A	Use materials with postconsumer or preconsumer recycled content value for a minimum of 10% of the total value, based on estimated cost of materials on the project.	●
4.505.3	Moisture content of building materials.	N/A	Moisture content of lumber may be measured with an appropriate handheld moisture meter.	○
○	= Eligible for points			
●	= Verified attribute			

N/A = Not applicable (i.e. this is a minimum requirement that is met and points/credits are not applicable).