

**Minutes**

GBI Consensus Body Meeting #12 Final

BSR/GBI 01-201X

Webinar

Wednesday, March 2, 2016 1:00 PM ET to 4:00 PM ET

**Attendance:**

No	Name	Organization(s)	12-16-15	1-13-16	2-18-16	2-19-16	3-2-16
1	Gregg Bergmiller	S/L/A/M Collaborative	X	X	X	X	X
2	Paul Bertram	Kingspan Insulated Panels, Inc.	X (Left Early)	X	X	X	X
3	Allan Bilka	International Code Council	X	X	X	X	
4	Jeff Bradley	American Wood Council	X	X	X	X	X
5	William Carroll	American Chemistry Council	X	X	Absent	X	X
6	Chris Dixon	NBBJ (rep. self)	X	X	Absent	X	X
7	Nicole Dovel-Moore	CTA Architects Engineers	Absent	Absent	Absent	Absent	X
8	Amber Dzikowicz	NSF International	Absent	X	X	X	X
9	David Eldridge	Grumman/Butkus Assoc.	X	X	X	X	X
10	William Freeman	Resilient Floor Covering Institute	X	X	X	X	X
11	Susan Gitlin	U.S. EPA	Observer	X	X	X proxy for Don Horn Part II	X
12	Don Horn	GSA	Alternate	X	X	X By proxy Part II	X
13	Josh Jacobs	UL Environment	X	X	X	X	X
14	Greg Johnson	Johnson Consulting Services, Greenscape Alliance	X	X	X	X	X
15	Karen Joslin			X	Absent	X	X
	Leslie Kahn	Admin. Office of the U.S. Courts	Resigned				
16	Malee Kaolawanich	NIH (rep. self)	X	X	Absent	Absent	Absent
17	Rachel	AIA	X	Absent	X	X	Altern

	Minnery						ate
18	Charles Kibert	University of Florida	X	X	X	X	X
19	Gary Keclik				X	X	X
20	John Koeller	Alliance for Water Efficiency	X	X	Absent	X	X
21	Jennifer Kowalonek	Alfred Benesch & Company	Absent	X	X	Absent	X
22	Michael Lehman	ConTech Lighting	Absent	X	X	X	X
23	Tien Peng	National Ready Mix Concrete Assn.	X	X	X	X	X
	Bernadette Reyes	Clark Construction Group	Resigned				
	Angela Rivera	URS Corporation (rep. self)	Absent	Absent	Resigned		
24	Jane Rohde	JSR Assoc. Inc., Vinyl Institute	X	X	X	X	X
25	Gord Shymko	G.F. Shymko & Associates, In.	X	X	Absent	Absent	X
	Julie Sobelman	Independent Consultant	Resigned				
26	Kent Sovocool	Southern Nevada Water Authority	X	X	X	X	Absent
27	Steve Strawn	JELD-WEN	X (Proxy for Paul Bertram)	Absent	Absent	Absent	Absent
28	George Thompson	Chemical Compliance Systems, Inc.	X	X	X	X	X
29	Angela Tin	American Lung Assn.	Alternate	Absent	X	X	X
30	Douglas Tucker	Misubishi Electric Cooling & Heating	Absent	Absent	X	Absent	X
31	Erika Winters Downey	American Institute of Steel Construction	Alternate	X	Alternate	Absent	Alternate
<b>Voting Alternates</b>							
	Abby Brokaw	American Lung Assn. (voting Alternate for Angela Tin)	<b>X</b>			<b>X</b>	<b>X</b>
	Paul Karrer	AIA (Alternate for Rachel Minnery)					<b>X</b>
	Bill Hoffman	UL Environment					

		(Voting Alternate for Josh Jacobs)					
	Lance Davis	GSA (Voting Alternate for Don Horn)	X				
	D'Lane Wisner	D'Lane Wisner (Voting Alternate for William Carroll)					
	John Cross	American Institute of Steel Construction (Voting Alternate for Erika Winters-Downey)	X		X		X
TOTALS			23/29	25/32	23/31	24/31	27/31
<b>Visitors</b>							
	Ed Deomano	Composite Panel Association	X		X	X	X
	Christian Taber	Big Ass Solutions	X		X		
	Brent Mecham	Irrigation Association	X				
	Jiri Skopek	JLL	X	X			
	Martha VanGeem	Self (Principal Engineer)	X	X	X	X	X
	Chris Hsieh	Trane	X				
	Allen Blakey	Allen Blakey & Associates	X				
	Kyle Thompson	IAPMO	X		X	X	
	Jake Vandevort	B&C Consortia Management, L.L.C.?		X			
	Sydney Lindquist	Hexion Inc.		X			
	Ric Doedens	K.R. Moeller Associates, Ltd.		X			X
	David Sundersingh	Self		X			
	Mike Cudahy	Plastic Pipe and Fittings Association		X	X	X	X
	Alfred Hodgson	Berkeley Analytical		X			
	Kevin McKenny	Window & Door Manufacturers		X			

		Association					
	James Kirby	Center for Environmental Innovation in Roofing (CEIR)		X			
	Kelly Scanlon	U.S. EPA			X		
	Alesia Call	Architect of the Capitol					X
<b>Staff/Consultants</b>							
	Wayne Trusty	Chair	X	X	X	X	X
	Vicki Worden	Executive Director, GBI	X		X	X	
	Emily Randolph	Secretariat Asst., GBI	X	X	X	X	X
	Micah Thomas	Staff, GBI					
	Maria Woodbury	Secretariat, GBI	X	X	X	X	X

**Wednesday, March 2, 2016**

**Welcome & Roll Call**

Chair, Wayne Trusty, welcomed participants. Roll call established quorum. At this meeting, two members voted using voting alternates (John Cross for Erika Winters-Downey and Paul Karrer for Rachel Minnery). There were no members voting via proxy.

Secretariat, Maria Woodbury informed participants that the call was being recorded for the purpose of minute taking and no objection was raised.

The anti-trust statement was reviewed and participants were requested to comply with it fully.

Woodbury reviewed the participation options, stating that while observers are welcome to participate in the discussion, only Consensus Body Members are able to vote. Participants were reminded to raise hands should they desire to add something new to the discussion and staff would then call on them in order.

**Administrative Procedures and Related Matters**

The agenda was reviewed and no changes were requested by the Consensus Body. It was noted that the order of the comments in the packet had been changed to coincide with the order of the comments on the agenda.

The membership roster was reviewed, noting that it is published online denoting interest categories and the organizations each individual is representing. Woodbury reported no change in membership. The Chair of the Project Management Subcommittee has changed from Nicole Dovel-Moore to Karen Joslin.

Trusty asked for a motion on the minutes from the meeting on February 18<sup>th</sup> and 19<sup>th</sup>, 2016.

**MOTION: A motion was made, seconded, and carried to approve the minutes from the previous Consensus Body Meeting on Thursday, February 18 and Friday, February 19, 2016.**

None opposed. None Abstained.

## **Discussion of public comments Subcommittee Reports**

### **Site**

Site Chair Gregg Bergmiller reported on the Site Comments:

#### **52 – 11. Substantive. 7.2.1:**

- **Comment:** Add the following new criterion:

7.2.1.x A bicycle parking rack is located within 50 feet of, and visible from, a main entrance.

Informational reference:

The Association of Pedestrian and Bicycle Professionals, Bicycle Parking Guidelines, 2nd Edition (2010)

- **Reason:** 7.2.1.5 is important to encouraging commuting by bicycle, but it does not do enough to allow for the use of bicycles for short-term visits, running of errands, and deliveries. To support the use of bicycles for this function, and to reduce the likelihood that bicyclists will lock their bicycles to an object (such as a lamppost, bench, or tree) and block access, egress, or walkways, it is important to provide bicycle parking spaces close to and visible from the main entrance.
- **Proposed Response:** Accept.
- **Note to GBI staff:** New credit to be added before or after 7.2.1.5 (long-term bicycle parking). We suggest 1-2 points TBD. Should come before long-term bicycle parking.
- **Subcommittee Vote Results:** Unanimously in favor

**MOTION: The motion was made and seconded to Accept the proposed response.**

**Discussion took place on the motion:**

- The proposal was made to label short-term parking using signage that imposes a time limit or that specifies the parking is for guests and visitors. The concern was raised that such an action would be overly specific and that many users of the standard would simply ignore the criterion. The point was also raised that many contractors won't include signs that aren't commercially available.
- One member noted that 50 feet is still far away for bike racks.

**The motion carried with 22 in favor, 2 opposed and none abstained.**

Opposed: Karen Joslin, David Eldridge

None Abstained.

#### **52 – 8. Substantive. 7.2.1:**

- **Comment:** We support the inclusion of this important criterion, but recommend that its source be referenced in the standard.

- **Reason:** This language appears to have been taken from ASTM E2844-15, *Standard Specification for Demonstrating that a Building’s Location Provides Access to Public Transit*.
- **Proposed Response:** Accept. Added as informational reference.
- **Subcommittee Vote Results:** Unanimously in favor

**MOTION:** The motion was made and seconded to Accept the proposed response. The motion carried with 23 in favor, none opposed, and none abstained.

None Opposed.

None Abstained.

**36 – 7. Substantive. 7.2.1.1:**

- **Comment:** Define “express mode of public transit” or delete it if the criteria are those in the bulleted list. Also, delete the space before the colon at the end of the first paragraph.
- **Reason:** It’s not clear if “express mode” is a precondition that also must meet the bulleted requirements, or if the bullets define what you’re calling “express mode transit”.
- **Proposed Response:** Accept as modified.

7.2.1.1

~~A building entrance is within 0.5 mi (0.8 km) walking distance from a stop for an express mode of public transit that operates within a dedicated right of way, or 0.25 mi (0.4 km) walking distance from a stop for local public transit. The stop is served by a transit route that offers service:~~

A building entrance is within 0.25 mi (0.4 km) walking distance of a local transit stop or 0.5 mi (0.8 km) walking distance of a rapid transit stop. (Local transit includes public transit that uses the same rights-of-way as automobiles AND for which the distance between stops averages less than 1/3 mi (0.5 km). Rapid transit is all other types of public transit.)

AND

The stop is served by a transit route that offers service:

- with single direction intervals (headways) no longer than 15 minutes during peak hours and 30 minute single direction intervals (headways) during off-peak hours for a minimum of 14 hours each weekday; and
- with single direction intervals (headways) no longer than 1 hour and operating at minimum of 14 hours at least one day each weekend

- **Subcommittee Vote Results:** Unanimously in favor.

**MOTION: The motion was made and seconded to Accept the proposed response. The motion carried with 23 in favor, none opposed, and none abstained.**

None Opposed.

None Abstained.

**26 – 1. Substantive. 7.2.1.1:**

- **Comment:** Recommend a minimum of 25 points for public transportation
- **Reason:** Encourage downtown and urban infill development or smart growth strategies
- **Proposed Response:** Reject. The committee agrees that it's an important issue, but it is far more points than generally made available under this system. 10 points is already a high number of points. Moreover, other points are available to reward project that build near existing development.
- **Subcommittee Vote Results:** Unanimously in favor

**MOTION: The motion was made and seconded to Accept the proposed response. The motion carried with 23 in favor, none opposed, and none abstained.**

None Opposed.

None Abstained.

**36 – 13. Substantive. 7.3.4.4:**

- **Comment:** Add guidance for buildings not aligned north-south.
- **Reason:** It may be confusing for buildings not oriented with clear east and west walls.
- **Proposed Response:** Reject. This is covered in the Energy section under 8.3.1.2
- **Subcommittee Vote Results:** 10 in favor, 1 opposed.

**MOTION: The motion was made and seconded to Accept the proposed response. The motion carried with 23 in favor, none opposed, and none abstained.**

None Opposed

None Abstained

**43 – 14. Substantive. 7.3.4.4:**

- **Comment:** Modify as follows: ...SRI of 29 or greater. New concrete of concrete masonry without additional colored pigment is deemed to comply without additional testing.
- **Reason:** LEED and other sources recognize the inherent solar reflectance of concrete and products made with concrete without requiring additional testing on every mix design. This is allowed in 7.3.4.2. Solar reflectance values for concrete are documented in these references.
  1. Marceau, M. L., and M. G. VanGeem. 2008. "Solar Reflectance Values for Concrete." Concrete International, August.
  2. Marceau, M. L., and M. G. VanGeem. 2007. Solar Reflectance of Concretes for

LEED Sustainable Site Credit: Heat Island Effect. R&D Serial No. 2982, Portland Cement Association.

- **Proposed Response:** Accept as modified: “New concrete or concrete masonry without additional colored pigment is deemed to comply without additional testing.”
- **Subcommittee Vote Results:** Unanimously in favor

**MOTION: The motion was made and seconded to Accept the proposed response.**

**Discussion took place on the motion:**

- It was noted that concrete masonry is not included and would only rarely meet SRI requirements.
- There was a concern raised about listing specific products and the suggestion was made that the product be used. The commenter was present on the call and clarified that there has been testing on various materials on the darkest potential aggregates using three specimens for each mix and took the average including concrete.
- The point was raised that testing on job sites is expensive.

**The motion carried with 19 in favor, 1 opposed, and 2 abstained.**

Opposed: Susan Gitlin

Abstained: Bill Carroll, Jeff Bradley

#### **43 – 15. Substantive. 7.3.4.4:**

- **Comment:** Modify as follows: At least 75% of opaque wall surfaces (by area) on the east, ~~west and south~~ and west have an SRI...
- **Reason:** South elevations also benefit from having a higher SRI. The sun that shines on the south side is more intense (going through less of the atmosphere).
- **Proposed Response:** Accept as modified. Add south based on proponents reasons.
- **Subcommittee Vote Results:** 6 in favor, 5 abstained.

**MOTION: The motion was made and seconded to Accept the proposed response. The motion carried with 24 in favor, none opposed and none abstained.**

None Opposed.

None Abstained.

#### **24 – 28. Substantive. 7.3.4.4:**

- **Comment:** ASTM E1980-11
- **Reason:** At no point in this standard does it indicate what version of the SRI Standard is intended.
- **Proposed Response:** Accept.
- **Subcommittee Vote Results:** Unanimously in favor

**MOTION: The motion was made and seconded to accept the proposed response. The motion carried with 23 in favor, none opposed, and 1 abstained.**

None Opposed.

Abstained: John Koeller



**37 – 1. Substantive. 7.3.4.X:**

- **Comment:** Revise as follows: At least 50% of the planned hardscape area (walkways, patios, driveways, etc.) use permeable materials that can include one or more of the following: Clay or concrete paver with pervious joints/openings; Bricks; gravel; vegetative paving systems; mulch; pervious concrete; and/or porous asphalt.
- **Reason:** Several research studies have identified that permeable hardscapes can mitigate urban heat island (UHI) effect due to their high air void nature (Li 2012, Li 2013, Stempihar 2012, Kevern 2012, Haselbach and Gaither 2008, Kim et al. 2007, Haselbach et al. 2011).

Due to the high void nature, permeable hardscapes cool faster than conventional pavements; They have a rapid cooling effect via evaporation within the structure's air voids (Cambridge Systematics, 2005; Kevern 2012).

As a result, researchers have recorded permeable pavements with lower nighttime temperatures compared to other materials with similar or higher albedo (Stempihar 2012, Golden 2006).

In addition, not only can permeable pavement systems reduce stored pavement energy, they insulate the ground, which also has an urban heat island mitigating impact (Haselbach and Gaither2008).

Recognizing this, even EPA has identified permeable pavements including porous asphalt, as a "Cool Pavement" technology (EPA 2008) for urban heat island mitigation and other agencies and organizations have followed suit (Greenroads, Global Cool Cities Alliance and R20, 2012, Houston Advanced Research Center 2009- representing Dallas, CTL Group 2012-representing City of Chula Vista, City of Las Vegas 2010).

Li, Hui (2012) Evaluation of Cool Pavement Strategies for Heat Island Mitigation. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-12-33

Li, Hui; Harvey, JT; Holland, TJ; and Kayhanian, M. (2013). "The use of reflective and permeable pavements as a potential practice for heat island mitigation and stormwater management. Ev

Stempihar, JJ; Pourshams-Manzouri, T; Kaloush, K; and Rodezno, C. (2012) Porous Asphalt Pavement Temperature Effects for Urban Heat Island Analysis. Transportation Research Record. Vol. 2293, p. 123- 130.

Cambridge Systematics (2005). Cool Pavement Report: EPA Cool Pavements Study – Task 5. Available online: [http://www.epa.gov/heatisland/resources/pdf/CoolPavementReport\\_For mer%20Guide\\_complete.pdf](http://www.epa.gov/heatisland/resources/pdf/CoolPavementReport_For%20mer%20Guide_complete.pdf)

Kevern, J.T., Haselback, L. and Schaefer, V.R. (2012). "Hot Weather Comparative Heat Balances in Pervious Concrete and Impervious Concrete Pavement Systems." Journal of Heat Island Institute International Vol. 7-2. 2012. 231-237.

Haselbach, L, Boyer.M, Kevern, JT. And Schaefer, VR. (2011). Cyclic Heat Island Impacts on Traditional Versus Pervious Concrete Pavement Systems. Transportation Research Record. Vol. 2240. pp. 104-115.

Haselbach, L., and A. Gaither. Preliminary Field Testing: Urban Heat Island Impacts and Pervious Concrete. Proceedings NRMCA 2008 Concrete Technology Forum: Focus on Sustainable Development, Denver, CO, May 20-22, 2008 (CD-ROM).

Kim, H.; Hojo, J.; and Lee, S.W. Thermal Properties of Water- Absorbing and Surface Modified Porous Pavements. Materials Science Forum Vols. 544-545. pp.913-916.

Greenroads. Cool Pavement. Available online: <https://www.greenroads.org/1429/45/cool-pavement.html>

Golden, Jay, and Kamil Kaloush, "A Hot Night in the Big city: How to Mitigate the Urban Heat Island," Public Works, December 2005.

Available online: <http://www.pwmag.com/industry-news.asp?sectionID=770&articleID=268116>, accessed September 5, 2006.)

EPA 2008. Reducing Urban Heat Islands: Compendium of Strategies – Cool Pavements. Available online: <http://www.epa.gov/hiri/resources/pdf/CoolPavesCompendium.pdf>

Global Cool Cities Alliance and R20. (2012). A Practical Guide to Cool Roofs and Cool Pavements. Available online: [http://www.coolrooftoolkit.org/wp-content/pdfs/CoolRoofToolkit\\_Full.pdf](http://www.coolrooftoolkit.org/wp-content/pdfs/CoolRoofToolkit_Full.pdf).

Houston Advanced Research Center. 2009. Urban Heat Island. Available online: [http://www.visionnorthtexas.org/NTAF/Documents/Dallas\\_Urban\\_Heat\\_Island\\_Report.pdf](http://www.visionnorthtexas.org/NTAF/Documents/Dallas_Urban_Heat_Island_Report.pdf)

CTLGroup. 2012. Cool Pavement Study: Final Report. Submitted to City of Chula Vista. Available online: [http://www.chulavistaca.gov/clean/PDF/CVCoolPavementsStudy\\_DRA\\_FT9-7-12.pdf](http://www.chulavistaca.gov/clean/PDF/CVCoolPavementsStudy_DRA_FT9-7-12.pdf).

City of Las Vegas, 2010. Summary Report: Urban Heat Island Effect. Available online: [http://www.lasvegasnevada.gov/files/UHI\\_Report\\_2010-2.pdf](http://www.lasvegasnevada.gov/files/UHI_Report_2010-2.pdf)

- **Proposed Response:** Accept as modified. Apply to 7.5.1.6. Modify to replace "planned" with "installed".
- **Subcommittee Vote Results:** 9 in favor, 1 abstained

**MOTION: The motion was made and seconded to Accept the proposed response.**

**Discussion took place on the motion:**

- The concern was raised that this is more of a Stormwater issue than a Heat Island Mitigation issue and that this credit belongs in the Stormwater section. One member stated that it is redundant to include this criterion in the Site Section. Another member countered that this is important in reducing heat island effect in addition to being important in stormwater management and should be included.

- It was pointed out that pervious and permeable can be interchangeable and that one shouldn't be crossed out in favor of another. The suggestion was made to state "pervious or permeable"
- One member stated that this will probably appear on the landscape plan and should therefore be addressed with other landscape items. Another said that this should have both performance and/or prescriptive criteria to establish it as a system.

**The motion was withdrawn.**

**MOTION: The motion was made and seconded to send the comment back to the Subcommittee for further discussion. The motion carried with 18 in favor, 4 opposed, and 2 abstained.**

Opposed: Jane Rohde, Greg Johnson, Angela Tin, Tien Peng

Abstained: Bill Carroll, Paul Bertram

## Materials

Materials Chair Charles Kibert reported on the Materials Comments:

### 7 – 14. Substantive. 10.2.1.1

- **Comment: 10.2.1.1** A minimum of twenty products includes "**can provide**" one or more of the following that at a minimum evaluates the *cradle-to-gate product life cycle*: Third party verified Type III Environmental Product Declarations (EPD) according to ISO 21930, "either product-specific or industry average";
  - Third party Multiple Attribute Product Certification; and/or
  - Third party verified product life cycle assessment based upon ISO 14040 and 14044
- **Reason:** This section is not specific as to whether product-specific or industry average EPD's will be allowed. For industries like the steel industry, an industry average EPD is more feasible and representative of the installed product than a fabricator specific product EPD. EPDs are intended to reflect the impacts of the installed product. In the case of structural steel that is the fabricated product including the impacts of fabrication not the material originating at the steel mill. In the US there are nearly 2,000 steel fabricators many of whom are small, family businesses.

The creation of a fabricator shop specific EPD would be an economic impossibility for many of these firms. In addition, shop specific EPDs would not accurately reflect the impacts associated with that shop's operations.

As each project is different, each structural section required by a project is a separate "product". If during a given period of time a shop worked on many projects that required large beams with little fabrication, that shop's associated EPD would show a minimal level of impacts. But if that same shop fabricated steel for a project that required a large number of small beams with more complex fabrication requirements, the increasing level of impacts would not be

reflected in the “producer” EPD that was based on the earlier projects. In this case the more accurate measurement of impacts would be based on an industry average reflecting the marketplace mix of product requirements. As written, the section could be interpreted to only allow product specific EPD’s.

- **Proposed Response:** Accept as modified “Product manufacturers provide one or more of the following for a minimum of 20 products” – as product can have one or more EPDs/Certification/Product Life Cycle assessment; i.e. carpet as an example. Include “either product-specific or industry average”
- **Subcommittee Voting Results:** 9 in favor, 2 abstained.

**MOTION: The motion was made and seconded to accept the proposed response.**

**Discussion took place on the motion:**

- The argument was made that EPDs and industry averages are very different with one requiring more effort than the other and should not be weighted the same. It was suggested that they be weighted at different levels. It was explained that the goal of the credit is to move the market forward and that it would be valuable to do either an EPD or an industry average which is why there was no variation suggested for the points.
- It was pointed out that some industries are forced to rely on averages for specific products. The statement was made that this credit refers to products as delivered to the project site and that an industry average is needed at this level. The previous statement was qualified saying that an industry average must be properly vetted.
- The Chair noted that industry averages are determined by a representative sample and then are weighted. All members participate but not all members provide data.

**The motion carried with 13 in favor, 7 opposed, and 4 abstained.**

Opposed: Amber Dzikowicz, Paul Karrer, Susan Gitlin, Chris Dixon, Bill Freeman, Josh Jacobs, Tien Peng

Abstained: Doug Tucker, Paul Bertram, Don Horn, John Koeller

**1 – 2 (3M). Substantive. 10.2.1.1:**

- **Comment:** Third party verified Type III Environmental Product Declarations (EPD) according to ISO 21930 or 14025.
- **Reason:** Third party verified EPDs from other programs should be allowed. The third party verified EPD should be considered valid if generated through a program that is ISO 14025 compliant.
- **Proposed Response:** Accept as proposed.
- **Subcommittee Vote Results:** Unanimously in favor.

**MOTION: The motion was made and seconded to accept the proposed response. The motion carried with 23 in favor, none opposed, and 1 abstained.**

None Opposed.

Abstained: Josh Jacobs

#### **48 – 1. Substantive. 10.2.1.1:**

- **Comment:** The product life cradle to *gate* evaluation should include:
  1. A minimum list of impact categories that would be eligible for point credits; or
  2. A threshold number of impact categories that would be eligible for point credits: or
  3. Award more points for greater number of impact categories that are assessed for a product.
- **Reason:** If one company evaluates 10 impact categories while another of a similar product evaluates three categories, this standard rewards each product with the same number of points. More point credit should be awarded for the greater number of impact categories evaluated, or at the very least, a threshold number and type of impact categories specified that would earn points. Some basic assessment should be done to make all products comparable to some degree, e.g. GHG, embodied energy, eutrophication, etc.

#### **48 – 2. Substantive. 10.2.1.2:**

- **Comment:** The product life cradle to gate evaluation should include:
  1. A minimum list of impact categories that would be eligible for point credits; or
  2. A threshold number of impact categories that would be eligible for point credits: or
  3. Award more points for greater number of impact categories that are assessed for a product.
- **Reason:** If one company evaluates 10 impact categories while another of a similar product evaluates three categories, this standard rewards each product with the same number of points. More point credit should be awarded for the greater number of impact categories evaluated, or at the very least, a threshold number and type of impact categories specified that would earn points. Some basic assessment should be done to make all products comparable to some degree, e.g. GHG, embodied energy, eutrophication, etc.

#### **48 – 3. Substantive. 10.2.1.2:**

- **Comment:** For those products that are attempting to use the complete cradle to grave evaluation for point credits in 10.2.1.1, the same impact categories for each should be applied, as opposed to certain categories satisfying one section, and different impact categories satisfying another section.
- **Reason:** Use of the same impact categories for each stage of the LCI may prevent product manufacturers from only including certain impacts during certain stages of the evaluation. In other words, if cradle to gate has a large energy impact, and the gate to grave use has a small energy impact, it would be incorrect for a product manufacturer to only report the energy impact for the gate to grave section. The standard is ambiguous in this regard.
- **Proposed Response:** Reject. The standards referenced already include the minimum number of impact categories.
- **Subcommittee Vote Results:** Unanimously in favor

**MOTION: The motion was made and seconded to accept the proposed response for comments 48 – 1, 48 – 2, and 48 – 3.**

**Discussion took place on the motion:**

- It was clarified that the proposed response is to reject the comments.

- One member raised the point that 48 – 3 was not about the number of impact categories. The Consensus Body was informed that the commenter was present during the Subcommittee discussion and was comfortable with the proposed response.

**The motion carried with 21 in favor, none opposed, and 2 abstained.**

None Opposed.

Abstained: Susan Gitlin, Tien Peng

**1 – 3 (3M). Substantive. 10.2.1.2:**

- **Comment:** Third party verified Type III Environmental Product Declarations (EPD) according to ISO 21930 or 14025.
- **Reason:** Third party verified EPDs from other programs should be allowed. The third party verified EPD should be considered valid if generated through a program that is ISO 14025 compliant.
- **Proposed Response:** Accept.
- **Subcommittee Vote Results:** Unanimously in favor.

**MOTION: The motion was made and seconded to Accept the proposed response. The motion carried with 24 in favor, none opposed, and none abstained.**

None Opposed.

None Abstained.

**48 – 12(incorrectly labeled in packet as 1(3M) – 4). Substantive. 10.4.1**

- **Comment:** The standard should include a section on smart ICT infrastructure per the following standard: ANSI/TIA-4994: Standard for Sustainable Information Communications Technology. Guidelines for architects, building owners, engineers, manufacturers, integrators, designers, and facility managers. clear, industry-sanctioned guidelines for designing, installing and operating more efficient ICT systems.
- **Reason:** Optimizing building operation will have an impact on reducing energy and sustaining a healthier indoor climate.
- **Proposed Response:** Reject ~~the comment~~. The standard focuses on multiple things including energy saving and operations which this section of the rating system does not address.
- **Subcommittee Vote Results:** 11 in favor 1 opposed.

**MOTION: The motion was made and seconded to accept the rejection of the comment.**

**Discussion took place on the motion:**

- The comment was made that the standard mentioned in this comment was meant for a different section. The question was raised regarding whether the commenter was in error. The concern was raised that the comment shouldn't be rejected solely on the fact that it's proposed for the wrong section. It was proposed that an Executive Session could consider finding a place for this comment to be addressed.
- The point was raised that there are many materials issues where energy is also a concern.
- It was proposed that the language be changed to "operation of the building"

**The motion carried with 25 in favor, none opposed, and none abstained.**

None Opposed.

None Abstained.

**1 – 4 (3M). General. 10.4:**

- **Comment:** Add Section 10.4.2.
- **Reason:** As with other requirements, a section should be added to include Recommended documentation.
- **Proposed Response:** Accept. Include the following in Recommended Documentation: “Manufacturer’s product data sheets or a statement from manufacturer certifying claims.”
- **Subcommittee Vote Results:** Unanimously in favor.

**MOTION: The motion was made and seconded to Accept the proposed response. The motion carried with 24 in favor, none opposed, and none abstained.**

None Opposed.

None Abstained.

**48 – 11. Substantive. 10.4.1.1 &10.5.2:**

- **Comment:** Repurposed products and materials are considerably more sustainable than recycle content, biobased, or forest certified. The points for sustainable materials allows up to 20 points yet the points for 10.5.2 for reused materials from off-site only allows for 4 points. The points need to be revised to credit repurposed and recovered materials from off-site to get more points than reconstituted, recycled, biobased, or forest certified materials.
- **Reason:** Repurposed or reused products or materials extracted from prior use in another building as described in 10.5.2 should be credited higher than sustainable materials described in 10.4.1.1 even though they might not contain any pre-, or post-consumer recycle content, or biobased, or forest certifications. Reused products are the most sustainable of this group.
- **Proposed Response:** Reject. Repurposed products and materials are addressed in 10.5 which is weighted higher than 10.4.
- **Subcommittee Vote Results:** 11 in favor, 2 abstained.

**MOTION: The motion was made and seconded to accept the rejection of the comment.**

**Discussion took place on the motion:**

- The concern was expressed that repurposed materials are not earning project teams as many points as they should. It was pointed out that the fact that project teams can add points for use of repurposed materials in addition to new materials gives added value.
- It was noted that the point allocations will be re-visited at the end of the comment review period.

**The motion carried with 22 in favor, 1 opposed, and none abstained.**

Opposed: Susan Gitlin

None Abstained.

52 – 51. Substantive. 10.4.1.1:

- **Comment:** Revise as follows:

~~Calculate the percentage of materials using the below multiplier values based on the listed characteristics. Determine the percentages, by cost, of the products that qualify towards Sustainable Material Attributes. Points are awarded based on the following and final score by adding values reported by percentages of materials, by cost, that carry the *pre-consumer recycled content, post-consumer recycled content, biobased content or third party sustainable forestry certification content* attribute:~~

~~Product Sustainable Attribute Material = Pre-consumer recycled content % + Post-consumer recycled content % + Biobased content % + Third Party Sustainable Forestry Certification content %~~

~~To determine the percentages, by cost, of the products that carry the listed attributes, use the formula below. When entering values in the above formula, ~~o~~ Only the portion of these materials that has ~~ve~~ the identified value attribute should be included. For example, if a product has 40% pre-consumer recycled content, only 40% of the value of that product is included.~~

~~Percentage of Product Sustainable Attribute Material % = (Total Product Sustainable Attribute Portion of the Material with the Attribute)/(Total Material Value)~~

~~Biobased content percentage may be calculated by weight or in accordance with ASTM D6866 – Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis.~~

~~Percentage of Product Sustainable Attribute Material = (Total Product Sustainable Attribute Material)/(Total Material Value)~~

The following forest certification systems are recognized:

- Forest Stewardship Council (FSC)
- Sustainable Forestry Initiative, Inc. (SFI)
- American Tree Farm System (ATFS)
- Canadian Standards Association Sustainable Forestry Management (CSA) Programme for the Endorsement of Forest Certification (PEFC)
- **Reason:** The requirement and the calculation are difficult to understand, as written. Examples for the calculations could be helpful.
- **Proposed Response:** Accept as modified. “Points are awarded based on calculating a final score by adding percentages...” The suggested change provides more clarity.



- **Subcommittee Vote Results:** 11 in favor, 2 abstained.

**MOTION: The motion was made and seconded to Accept the proposed response. The motion carried with 22 in favor, none opposed, and 1 abstained.**

None Opposed.

Abstained: Don Horn

## **Indoor Environment**

Indoor Environment Chair Mike Lehman reviewed the Indoor Environment Comments:

### **13 – 4. Substantive. Table 11.2.1.1**

- **Comment:** VOC Content<sup>1</sup> 1 point
- **Reason:** For superscript "1" provide reference document for values in table, e.g. SCAQMD Rule 1168 (date). As currently stated, Rule 1168 is just informational.
- **Proposed Response:** Accept as modified: Add superscript 1 to table 11.2.1.2 and connect it with CARB listing below.
- **Subcommittee Vote Results:** 9 in favor, 1 abstained

**MOTION: The motion was made and seconded to Accept the proposed response.**

**Discussion took place on the motion:**

- The question was raised whether this should refer to VOC emissions. It was explained that VOC content and VOC emissions had been separated out in the credit.

**The motion carried with 20 in favor, none opposed, and 1 abstained.**

None Opposed.

Abstained: David Eldridge

### **56 – 17. General. 11.2**

- **Comment:** BSR/GBI 01-201X is very current, and includes a comprehensive list of VOC content, meeting the Guiding Principles for New Construction requirement for Low-Emitting Materials.
- **Reason:**
- **Proposed Response:** Accept the comment as Noted.
- **Subcommittee Vote Results:** Unanimously in favor.

**MOTION: The motion was made and seconded to accept the proposed response.**

**The motion carried with 21 in favor, none opposed, and 1 abstained.**

None Opposed.

Abstained: David Eldridge

### **15 – 2. Substantive. 11.2**

- **Comment:** Instead of contaminant testing, a pre-occupancy IAQ assessment can be conducted to determine if general IAQ performance standards are met.
- **Reason:** I can help you develop language on this, if interested.
- **Proposed Response:** Reject on the basis that pre-occupancy IAQ assessment is covered in 11.2.2 Pre-Occupancy Indoor Air Quality Testing and the commenter did not propose any change.

- **Subcommittee Vote Results:** Unanimously in favor.

**MOTION: The motion was made and seconded to Accept the recommendation of the Subcommittee.**

**Discussion took place on the motion:**

- There was a friendly amendment proposed to clean up the language in the response.

**The motion was amended to strike “and the commenter did not propose any change.” From the reason statement. The amendment was seconded. The motion carried with 22 in favor, none opposed, and 1 abstained.**

None Opposed.

Abstained: David Eldridge

### **15 – 3. Substantive. 11.2**

- **Comment:** Add design, construction process and verification provisions to control moisture and prevent mold growth
- **Reason:** This is the #1 IAQ problem associated with construction and is not addressed in a meaningful way by Green Globes. The draft National Green Building Standard for residential has good language covering this.
- **Proposed Response:** Reject on the basis that moisture control in buildings is addressed in 6.4.1.1, if you feel there is additional information required for this, please provide a specific response.
- **Subcommittee Vote Results:** 11 in favor, 1 abstained.

**MOTION: The motion was made and seconded to accept the proposed response with an amendment to remove the 2<sup>nd</sup> part of the response. The response would read: “Reject on the basis that moisture control in buildings is addressed in 6.4.1.1. The motion carried with 22 in favor, none opposed, and 2 abstained.**

None Opposed.

Abstained: Don Horn, Tien Peng

### **13 – 1. Substantive. 11.2.1.1**

- **Comment:** ~~Certified products meet the VOC content and emissions criteria.~~
- **Reason:** Statement is not needed and is misleading. The two bullets for award of points provide separate credit for VOC emissions and VOC content. Certification is not a requirement to earn points.
- **Proposed Response:** Accept as modified: Strike this sentence from the rating system. Also strike ““Certified” means compliance with any of the certifications listed in Table 11.2.1.1: Adhesives and Sealants VOCs”. The commenter identified an error in the language that requires a removal of both this sentence and the accompanying sentence.
- **Subcommittee Vote Results:** 8 in favor, 2 opposed, 2 abstained.

**MOTION: The motion was made and seconded to Accept the Subcommittee response. The motion carried with 24 in favor, 1 opposed, and none abstained.**

Opposed: Josh Jacobs

None Abstained.

**13 – 2.13 – 5. 13 – 10.13 – 18. Substantive. Multiple sections**

- **Comment:** “Certified” means valid, current recognition by a certification body accredited to ISO 17065 and with relevant certification program in the scope of its accreditation. Potential certification programs are listed in Table 11.2.1.1: Adhesives and Sealants VOCs.
- **Reason:** To be acceptable, a third certifier should be accredited to ISO 17065 and have the certification program listed in its scope of accreditation. ISO 17065 establishes the minimum quality requirements for certification bodies. UL Environment and SCS Global Services are both accredited. Using this requirement will relieve GBI of the responsibility of determining the acceptability of a certification body.
- **Proposed Response:** Accept as modified: “Provide documentation indicating compliance with the VOC content emission requirements as stated in the Standard Private Office Scenario in CDPH Standard Method V1.1 Tables 4.4 and 4.5 and are compared to the maximum allowable concentrations in CDPH Standard Method V1.1, Table 4.1. does not exceed the maximum allowable concentrations or a certification by a certification body accredited to ISO 17065 and with relevant certification program in the scope of its accreditation. Certification programs include but are ~~third party testing organization including,~~ but not limited to, one of the following:” Deleted the sentence where it was originally placed, but this is still a valid requirement.
- **Subcommittee Vote Results:** 11 in favor, 1 abstained.

**MOTION: The motion was made and seconded to accept the proposed response.**

**Discussion took place on the motion:**

- An editorial error was pointed out that occurred when copying and pasting the comment into the packet. The error was fixed.

**The motion carried with 19 in favor, none opposed, and 2 abstained.**

None Opposed.

Abstained: Don Horn, Karen Joslin

**17 – 1. Substantive. Table 11.2.1.1:**

- **Comment:** ~~2. Indoor REL developed by the California Office of Environmental Health and Hazard Assessment (OEHHA):~~
- **Reason:** The Protocol should not rely solely on the indoor REL values developed by OEHHA. Instead the most relevant and up-to-date reference values should be used. For example, the World Health Organization (WHO) has developed guidelines for indoor air quality with associated values; as well the Texas Commission on Environmental Quality also develops inhalation reference values. There is no valid scientific reason that the Protocol should be limited to using the OEHHA information. It should rely on the best available information.

**5 – 5. Substantive. Table 11.2.1.1.**

- **Comment:** ~~2. Indoor REL developed by the CA OEHHA~~

- **Reason:** A company could not use the RELs to demonstrate compliance with the VOC content limits. It is not clear why a table specifying VOC limits would include a citation to reference exposure levels.

**4 – 1. Substantive. Table 11.2.1.1**

- **Comment:** ~~2. Indoor REL developed by the California Office of Environmental Health and Hazard Assessment (OEHHA):~~
- **Reason:** The protocol should not rely solely on the indoor REL values developed by OEHHA. Instead the most relevant and up-to-date reference values should be used. For example, the World Health Organization (WHO) has developed guidelines for indoor air quality with associated values; as well the Texas Commission on Environmental Quality also develops inhalation reference values. There is no valid scientific reason that the Protocol should be limited to using the OEHHA information. It should rely on the best available information.

**30 – 6. Substantive. 11.2.1.1:**

- **Comment:** ~~2. Indoor REL developed by the California Office of Environmental Health and Hazard Assessment (OEHHA):~~
- **Reason:** The Protocol should not rely solely on the indoor REL values developed by OEHHA. Instead the most relevant and up-to-date reference values should be used. For example, the World Health Organization (WHO) has developed guidelines for indoor air quality with associated values; as well the Texas Commission on Environmental Quality also develops inhalation reference values. There is no valid scientific reason that the Protocol should be limited to using the OEHHA information. It should rely on the best available information.
- **Proposed Response:** ~~Accept by deleting 2<sup>nd</sup> Footnote.~~
- **Subcommittee Vote Results:** Unanimously in favor.

**MOTION: The motion was made and seconded to accept the proposed responses for 17 – 1, 5 – 5, 4 – 1, and 30 – 6. The motion carried with 22 in favor, none opposed, and none abstained.**  
None Opposed.  
None Abstained.

**13 – 8. Substantive. 11.2.1.1.**

- **Comment:** Promote SCAQMD Rule 1168 as normative reference for VOC content requirements in Table 11.2.1.1
- **Reason:** GBI must reference authoritative body for values in table to relieve GBI of responsibility for these values.
- **Proposed Response:** Reject comment on the basis that it is already correctly stated in the draft standard.
- **Note:** Commenter willing to withdraw comment.
- **Subcommittee Vote Results:** Unanimously in favor.

**MOTION: The motion was made and seconded to accept the Subcommittee recommendation.**  
**Discussion took place on the motion:**

- It was noted that the commenter was comfortable with the Subcommittee response.

**The motion carried with 22 in favor, none opposed, and none abstained.**

None Opposed.  
None Abstained.

**13 – 12. Substantive. Table 11.2.1.2**

- **Comment:** ~~Indoor REL developed by the California Office of Environmental Health Hazard Assessment California Department of Public Health Standard Method, V1.1, Table 4-1 Target CREL VOCs and their maximum allowable concentrations.~~
- **Reason:** Incorrect reference for VOC emissions criteria. The compounds and the acceptance criteria are listed in Table 4-1 of the CDPH Standard Method V1.1 (with the exception of formaldehyde, the acceptance criteria are ½ CRELs for a defined list of VOCs that can be measured by the specified methods).

**17 – 2. Substantive. Table 11.2.1.2**

- **Comment:** ~~2. Indoor REL developed by the California Office of Environmental Health and Hazard Assessment (OEHHA):~~
- **Reason:** The Protocol should not rely solely on the indoor REL values developed by OEHHA. Instead the most relevant and up-to-date reference values should be used. For example, the World Health Organization (WHO) has developed guidelines for indoor air quality with associated values; as well the Texas Commission on Environmental Quality also develops inhalation reference values. There is no valid scientific reason that the Protocol should be limited to using the OEHHA information. It should rely on the best available information .

**5 – 6. Substantive. Table 11.2.1.2**

- **Comment:** ~~2. Indoor REL developed by the CA OEHHA~~
- **Reason:** Same comment as above

**4 – 2. Substantive. Table 11.2.1.2**

- **Comment:** ~~2. Indoor REL developed by the California Office of Environmental Health and Hazard Assessment (OEHHA):~~
- **Reason:** The Protocol should not rely solely on the indoor REL values developed by OEHHA. Instead the most relevant and up-to-date reference values should be used. For example, the World Health Organization (WHO) has developed guidelines for indoor air quality with associated values' as well the Texas Commission on Environmental Quality also develops inhalation reference values. There is no valid scientific reason that the Protocol should be limited to using the OEHHA Protocol should be limited to using the OEHHA information. It should rely on the best information.
- **Proposed Response:** Accept
- **Subcommittee Vote Results:** Unanimously in favor.

**MOTION: The motion was made and seconded to accept the Subcommittee recommendation for 13 – 12, 17 – 2, 5 – 6, and 4 – 2. The motion carried with 21 in favor, none opposed, and 1 abstained.**

None Opposed.  
Abstained: Bill Carroll

**5 – 7. Editorial. Table 11.2.2.1.1**

- **Comment:** Column - Maximum Concentration  $\mu\text{g}/\text{m}^3$
- **Reason:** What is the source of these values? Are they taken from a single source or from multiple sources? For example, the number for formaldehyde (33) is lower than the WHO indoor air value of 100.

**13 – 31. Substantive. Table 11.2.2.1.1:**

- **Comment:** Chronic RELs developed by the California Office of Environmental Health Hazard Assessment with the exception for formaldehyde.
- **Reason:** Add as normative reference for maximum allowed concentrations. Reference to the authoritative body will relieve GBI from responsibility for these values.
- **Proposed Response:** Accept. [References will be added to the standard.] Reference for most is OEHHA; formaldehyde is ASHRAE 189.1 Table 10.3.1.4
- **Subcommittee Vote Results:** 11 in favor, 1 abstained.

**MOTION: The motion was made and seconded to accept the proposed response for 5 – 7 and 13 – 31. The motion carried with 22 in favor, none opposed, and 1 abstained.**

None Opposed.

Abstained: Jeff Bradley

**4 – 3. Substantive. Table 11.2.2.1.1.**

- **Comment:** Formaldehyde.....~~33~~100
- **Reason:** It appears that the Protocol has set the formaldehyde maximum concentration value at 33 $\mu\text{g}/\text{m}^3$  based on an OEHHA recommended air limit in office environments. However, the Protocol should not be limited to utilizing only the OEHHA recommendations and instead should rely on the most relevant and up to date value. For example the World Health Organization developed an indoor air value in 2010 of 100 $\mu\text{g}/\text{m}^3$  for formaldehyde.

**30 – 8. Substantive. Table 11.2.2.1.1.**

- **Comment:** Formaldehyde.....~~33~~100
- **Reason:** It appears the Protocol has set the formaldehyde maximum concentration value at 33 $\mu\text{g}/\text{m}^3$  based on an OEHHA recommended air limit in office environments. However, the Protocol should not be limited to utilizing only the OEHHA recommendations and instead should rely on the most relevant and up to date value. For example the World Health Organization developed an indoor air value in 2010 of 100 $\mu\text{g}/\text{m}^3$  for formaldehyde.

**17 – 3. Substantive. Table 11.2.2.1.1.**

- **Comment:** Formaldehyde.....~~33~~100
- **Reason:** It appears that the Protocol has set the formaldehyde maximum concentration value at 33  $\mu\text{g}/\text{m}^3$  based on an OEHHA recommended air limit in office environments. However, the Protocol should not be limited to utilizing only the OEHHA recommendations and instead should rely on the most relevant

and up-to-date value. For an example, WHO developed indoor air value of 100 ug/m<sup>3</sup> for formaldehyde.

- **Proposed Response:** Reject comment and the reference will be added for formaldehyde as originating from ASHRAE 189.1. Committee feels that the number as determined by ASHRAE 189.1 is appropriate for IAQ testing in a sustainable high performance building.
- **Subcommittee Voting Results:** 10 in favor, 1 abstained.

**MOTION: The motion was made and seconded to accept the proposed response for comments 4 – 3, 30 – 8, and 17 – 3.**

**Discussion took place on the motion:**

- It was clarified that this number refers to testing limits.

**The motion carried with 21 in favor, none opposed, and 1 abstained.**

None Opposed.

Abstained: Jeff Bradley

#### **49 – 26. Substantive. 11.2.2.1:**

- **Comment:** This statement on applying any unearned credits from 11.2.1 is very confusing. Why are we giving a project unearned points from a separate credit? Is this in addition to the six max points for this credit? This should be more clear. There isn't any rationale listed for why unearned points from 11.2.1 should be applied and how. Suggest either deleting the ability to apply unearned credits or include a rationale for why unearned credits would be counted here.
- **Reason:** Either delete the option of including unearned points from 11.2.1 in this credit or provide a justification for doing so. Currently there is no justification or rationale to do this; and it just appears to be another way to game the system.
- **Proposed Response:** Accept the comment and delete the bullet to apply any unearned points.
- **Subcommittee Vote Results:** 5 in favor, 1 opposed, 3 abstained

**MOTION: The motion was made and seconded to accept the Subcommittee recommendation.**

**The motion carried with 21 in favor, none opposed, and 1 abstained.**

None Opposed.

Abstained: Josh Jacobs

#### **38 – 3. Substantive. 11.2.2:**

- **Comment:** ...unused points from 11.2.1, whereby the “unused points” is the difference between the maximum allowed (17 points) and the points earned.
- **Reason:** If this is the proper definition of “unused points”, then it should be explicitly stated.

#### **38 – 4. Substantive. 11.2.2.1.1:**

- **Comment:** 6 points + ~~Apply any unearned unused~~ points from 11.2.1 to this credit.
- **Reason:** Changes were made to the scoring to reflect the wording in Sec. 11.2.2.
- **Proposed Response:** Reject. Deleted when we addressed with Loxsom26.
- **Subcommittee Vote Results:** 7 in favor, 2 abstained.

**MOTION: The motion was made and seconded to accept the recommendation for comments 38 – 3 and 38 – 4. The motion carried with 21 in favor, none opposed, and none abstained.**  
None Opposed.  
None Abstained.

**15 – 1. Substantive. 11.2.2.1:**

- **Comment:** Delete section
- **Reason:** Green Globes effectively control VOCs through credits for meeting minimum ventilation rates and maximum allowable product emissions. VOC sampling has not been shown to provide additional benefit in terms of improved IAQ. It adds to project cost without producing useful data and can delay occupancy,  
New Construction VOC criteria do not target compounds related to IAQ. Identified VOCs for new construction VOC criteria were selected from lists of industrial chemicals without considering IAQ. As a result, the majority of compounds with new construction VOC criteria are not important in determining IAQ, whereas hundreds of compounds found in indoor air are not listed for assessment.  
Results of air sampling at the end of construction are not representative of occupant exposure and do not predict building performance after occupancy. Because VOC types and amounts vary both temporally and spatially, a small number of randomly collected samples do not document average or worst-case concentrations. Also, measurements made at the end of construction measure off-gassing at a time when it is diminishing (e.g., punch-out activities at this stage of construction often produce short-term VOC emissions). Problematic chemical exposures will not be detected where compounds are not listed. False negative conclusions regarding overall IAQ can also occur where VOC measurements comply with concentration limits, but conditions unrelated to VOCs adversely affect occupants (e.g., excess moisture). On the other hand, false positive conclusions regarding overall IAQ could be made when TVOC or VOC measurements exceed specified limits in buildings without adversely impacting occupants.  
New Construction VOC criteria were derived from the State of California's Chronic Reference Levels, which are not appropriate for use as IAQ standards. CREL target values are intended to prevent health effects in sensitive populations without considering feasibility. A more realistic objective IAQ for standards would be to minimize health effects to the extent feasible. Varying calculations are used for risk assessment which can result in wide differences in concentrations considered to be acceptable. CREL calculations were quite conservative in this regard, resulting in relatively stringent target values. Different results produced by risk assessments considering essentially the same health effects literature are illustrated by comparing the CREL for formaldehyde (9 ppb) to the formaldehyde concentration calculated by the World Health Organization to be acceptable for indoor air (100 ppb). While WHO's



formaldehyde evaluation reviewed levels which could be achieved by available technology, California did not consider feasibility in their CREL calculation. The most significant limitation of depending on CRELs to assess overall IAQ is that only a small fraction of VOCs present are considered. Although listed VOCs may all be in compliance with specified concentration limits, other VOCs can still be present at levels impacting occupants. Green Globes attempts to account for this by setting a concentration limit for total VOCs. However, a TVOC limit is no longer supported by researchers as a standard for indoor air because it cannot be associated with health effects. While TVOC is sometimes assumed to account for the cumulative toxicity of the mixture of VOCs, interactions (e.g., additivity) have generally not been found from exposure to chemical mixtures at low concentrations. TVOC's utility as a parameter for evaluating new construction is further limited because non-construction sources are significant contributors. An additional problem with use of TVOC is that it is calculated differently by various methods in current use

VOC sampling of new construction has not been shown to be effective as a screening tool for materials emissions. The majority of VOCs in indoor air originate from non-construction sources and many VOCs associated with materials emissions are not listed as VOC criteria.

6.10 Non-comparable sample collection techniques are permitted for pre-occupancy VOC sampling and considerable uncertainty is associated with the various sampling and analytical methods used to determine compliance with new construction VOC criteria.

- **Proposed Response:** Reject. The committee feels this issue is proof of performance and that all three pillars of good indoor air quality are working in concert. There are many instances where this type of testing has helped identify Indoor Air Quality issues that would not otherwise have been discovered until occupancy and therefore could have led to a disruption in service and potentially a negative impact in the overall environmental quality of the building.
- **Subcommittee Vote Results:** 8 in favor, 1 abstained.

**MOTION: The motion was made and seconded to accept the proposed response. The motion carried with 20 in favor, none opposed, and 1 abstained.**

None Opposed.

Abstained: Bill Freeman

**53 – 2. Substantive. 11.2.2.1.1 1<sup>st</sup> Paragraph:**

- **Comment:** Replace TO-1 with TO-15
- **Reason:** EPA method TO-1 is rarely used by indoor air quality (IAQ) professionals. The TO-15 (Summa canister) method is common.
- **Proposed Response:** Reject. TO-15 is a different sampling methodology that is not directly comparable to the solid sorbent thermal desorption methods currently listed.
- **Subcommittee Vote Results:** 7 in favor, 3 abstained.

**MOTION: The motion was made and seconded to accept the rejection of comment 53 – 2.**

**Discussion took place on the motion:**

- There was some confusion regarding the changes this motion would make. It was clarified that TO-1 would be left in and TO-15 would not be added. One members wondered whether both could be included.

**The motion carried with 21 in favor, none opposed, and none abstained.**

None Opposed.

None Abstained.

**Future Meetings**

Woodbury reviewed the schedule moving forward.

- There is an in-person meeting scheduled for March 21<sup>st</sup> through 23<sup>rd</sup> in Chicago.
  - Anyone who would like to attend or having questions about the in-person meeting should contact Secretariat, Maria Woodbury, at [maria@thegbi.org](mailto:maria@thegbi.org)
- There will be a two part webinar/conference call on April 28<sup>th</sup> and 29<sup>th</sup> from 12:00 Noon to 3:00 PM ET.

**New Business**

There was no new business raised.

**Adjournment**

**MOTION: A motion was made, seconded and unanimously carried to adjourn the meeting at 3:55 pm ET.**