

Materials transparency & risk for architects:

An introduction to advancing
professional ethics while managing
professional liability risks

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Institute
of Architects**

A note to the reader

This White Paper represents the ongoing work of the AIA Materials Knowledge Working Group to educate AIA members in the emerging issue of materials transparency and how it relates to the specification and use of construction materials. This White Paper in no manner represents or is intended as legal advice. Always seek the advice of an attorney or other qualified professional when making decisions related to contractual obligations, insurance, and the practice of architecture.

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5 things all architects should know about materials transparency

Transparency is the new normal. There is a growing expectation that everyone involved in a building project—from initial design to occupancy—should have access to information on the potential health and environmental impacts relating to those products.

Materials transparency represents opportunities for architects. These opportunities include competitive advantage, thought leadership, design innovation, and environmental and human health leadership.

New practices and procedures inherently present potential risks. We accept that there is some risk in advocating for materials transparency and sharing composition information with our clients. This white paper explores those risks in detail.

It will be important to manage potential risks with increased transparency. Although the risks associated with materials transparency are new, architects are familiar with risk management. This white paper offers several strategies for effectively evaluating and mitigating risk.

The AIA has tools and resources to help architects navigate materials transparency risks and opportunities. Along with this white paper and existing online resources, the American Institute of Architects published new model contract language to specifically address materials transparency issues. In addition, our Materials Knowledge Working Group, made up of expert members, practitioners and partner organizations, is continually developing education and practice tools to help architects optimize their approach to materials transparency.

Introduction

Transparency is all the rage these days. The information revolution is changing societal and professional dynamics; information that was once considered confidential or simply hard to find is becoming increasingly ubiquitous. As a result, what might once have seemed like an unrealistic expectation—that suppliers should share information about the ingredients in their products—has been turned on its head. Now the question is more often, “Why *shouldn’t* suppliers share all product information?” and “What can I do with this information now that I have it?”

This White Paper covers:

- The evolving landscape of transparency in product contents;
- The opportunity these changes represent for architects to help expose and thereby reduce hazardous substances, and to position themselves to serve their clients proactively;
- The actual and perceived risk of added exposure to legal liability that comes with that opportunity; and
- Strategies for communicating with clients, modifying contract documents, and collaborating with technical experts to manage the risks involved.

Within the realm of product content transparency, this White Paper aims to provide the context and background needed to engage intelligently with basic legal and practice questions. But it does not aspire to educate the reader on how to interpret an ingredient disclosure document, nor how to assess the impact of the hazard warnings that such a document might contain. As architects should explain to their clients, such interpretations and assessments should be performed by qualified material scientists, toxicologists, or industrial hygienists, according to the Materials & Risk Task Group of AIA’s Materials Knowledge Working Group.

The opportunity to encourage positive change

Understanding what a product is made of is part and parcel of the architect’s traditional role as a designer who is intimately familiar with the materials of the craft. In the past, this knowledge was focused on things like the provenance of a particular stone, which affected not just its appearance but also its durability and workability. In today’s industrial and post-industrial economy, materials are often made of chemicals synthesized in a factory and sometimes combined with organic content, making the understanding of materials and their constituent parts more complex than ever before. In order to make informed choices, one must have some understanding of the manufacturing and ingredient sourcing processes, and attention to those raw materials becomes even more essential

to the process of building with them as technology and construction techniques develop over time.

When it comes to building materials, trustworthy product content information is not just interesting for its own sake; it is useful for making choices based on the environmental and human health impacts of those products through their entire life cycle. Just the fact that they are being asked to disclose product ingredients is spurring many manufacturers to reconsider their formulations and seek less-hazardous alternatives.

In fact, the initiative to seek disclosure is driven primarily by a belief in the power of transparency to expose and thereby reduce unnecessarily harmful or risky choices. Architects can be in a strong position to encourage and incentivize disclosure, even if they lack the scientific expertise to interpret the data when it is disclosed. Whether or not it is used by architects, having the disclosed information gives building owners the option to engage independently qualified professionals to assess it, and makes it possible for third parties to use it to provide better-informed guidance.

Recognizing the risks

While acknowledging the potential benefits of transparency, some architects and legal counselors have raised concerns about the possibility of increased exposure to legal liability coming from seeking and retaining information on product contents. One common concern is that a building occupant may claim to have been injured by a substance contained in a product, and may assert that the architect was aware of the presence of the allegedly injurious substance and had a duty to avoid specifying products containing that substance. Another concern is that architects may not be fully aware of the contents of materials, or the contents may be obscured in some way, affecting what the architect knows or *should* know about materials. Finally, overreaching marketing claims for the delivery of “healthy” buildings and similar promises create risks and challenges for architects.

With limited information about the risk of new forms of transparency information, and with legal precedent not yet established, there are legitimate concerns. However, for each of these risk areas described above, there are also mitigation strategies and solutions described in this paper. Further, with the passage of time, we will understand more about the risks, and best practices related to obtaining, using, storing, and transferring the information will help us to manage them. As we continue to gather facts, guidance found in this White Paper and in other resources from the AIA can help architects manage and mitigate the risks associated with materials.

Identifying solutions for mitigating the risks: education and contract guidance

In order to address concerns about the potential for increased risk, the AIA convened a group in February 2015 to explore the topic in detail. That group, which included architects, legal counsel to architecture firms, professional liability insurance providers, and AIA staff, concluded that the legal risks should be managed and that AIA members would benefit from guidance. In addition, an AIA task group assigned to this work drafted suggested model contract language to help mitigate the risks. This White Paper elaborates on that guidance with additional context and explanation.

Suggestions for revisions to model contracts are now in the hands of the AIA Contract Documents Committee, and are being considered for inclusion with the next scheduled update to those documents, in 2017.

In addition, the AIA Contract Documents Committee has prepared explanatory text and model contract language to help those practitioners who choose to get involved with product content transparency. That guidance can be found in section 20 of the recently updated AIA Guide for Amendments to AIA Owner-Architect Agreements: Document B503™ – 2007:¹

www.aia.org/groups/aia/documents/document/aia076859.pdf

Defining product content transparency

This White Paper focuses on disclosures of substances that make up building products and potential health hazards associated with those substances. Examples of relevant transparency documents include Health Product Declarations (HPDs), Declare labels, and certifications.²

It is worth noting that content disclosures differ from Material Safety Data Sheets (MSDS), soon to be replaced by new Safety Data Sheets (SDS) to align with the Globally Harmonized System of Classification and Labeling of Chemicals. SDSs, included in the OSHA Standard 1910.1200 Entitled Hazard Communication, address only formulated products, not physical objects that are considered “articles.”³

The Occupational Safety and Health Administration (OSHA) also produces a number of standards that contain a requirement for “approval” of specific products by a Nationally Recognized Testing Laboratory (NRTL), a program which it also manages. After certifying a product, the NRTL authorizes the application of that laboratory’s certification mark to the product. Where these claims may not be legitimate, OSHA provides oversight and enforcement.⁴ It is important to understand in the context of product content disclosures that there are allowances and exceptions pertaining to confidential business information.

1 AIA Document B503 – 2007 Guide for Amendments to AIA Owner-Architect Agreements. www.aia.org/groups/aia/documents/document/aia076859.pdf

2 See Appendix O2 for a full list of material transparency tools.

3 OSHA 1910.1200(c), www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=10099

4 See www.osha.gov/dts/shib/shib021610.html

Limitations of EPDs in addressing human health concerns

Information about the carbon footprint and other environmental impacts of products through their life cycle is obtained through the practice of life-cycle assessment (LCA) and reported via environmental product declarations (EPDs). These documents, defined in the 14000-series of ISO standards, summarize the major ways a product impacts the environment, including global warming potential, smog creation potential, primary energy consumption, and water consumption.⁵ The LCA and resulting EPD are typically produced by a product manufacturer, often with the help of third-party consultants. This information can help architects select products with smaller environmental footprints.

EPDs are lacking when it comes to disclosing potential health hazards in products and materials, however. An EPD includes a list of basic ingredients and/or components but typically lacks the specificity needed for hazard

assessments—nor do they have a standardized method for disclosing hazards associated with product contents. Some unusually comprehensive EPDs include results in human-health-related impact categories, but the methodology used for those results focuses on emissions to air and water rather than hazards intrinsic to substances in the product. In addition, EPDs generally cover impacts only up to delivery of a product to the job site; they stop short of impacts from the “use” phase, where building occupants might be affected.

These limitations explain the need for alternative disclosure mechanisms such as Health Product Declarations (HPDs). However, because EPDs do not address health hazards to occupants in the building, they are not addressed further in this White Paper.

5 www.iso.org/iso/catalogue_detail?csnumber=38131

SDSs are intended primarily for use by contractors, to inform them of immediate risks from chemical exposures in their workplace and to guide them in safe work practices involving those chemicals.⁶ According to architect and sustainable materials expert Dru Meadows, architects are advised to avoid accessing, retaining, or using MSDS documents in order to keep the responsibility for the means and methods of using or installing these products with the contractor.⁷

Other types of product declarations, such as environmental product declarations (EPDs), that seek to quantify the carbon footprint and other impacts of products, are not addressed here because they do not raise direct liability concerns for the architect related to human health. Also excluded from the scope of this document are other building-related transparency initiatives, such as the energy benchmarking and disclosure laws that have recently emerged in many major U.S. cities.

By contrast with Safety Data Sheets, an HPD is a document voluntarily created and published by a building product manufacturer. HPDs disclose the contents of a building products, along with associated health hazards, allowing purchasers and end users greater access to product content and health information. HPDs are formatted for architects and other building professionals as well as toxicologists and materials scientists to use in a similar manner to other product information sheets and have been requested by many architectural firms within the design community.⁸

6 www.osha.gov/Publications/OSHA3514.html

7 “Getting From Design to Construction: Writing Specifications for Green Projects,” July 1, 2002. www2.buildinggreen.com/article/getting-design-construction-writing-specifications-green-projects

8 “Transparency in Building Products, and HPD, Gain Momentum,” Russell Perry, March 14, 2013. www2.buildinggreen.com/blogs/transparency-building-products-and-hpd-gain-momentum

What's the opportunity?

In December 2014, the American Institute of Architects Board of Directors approved the following Position Statement, in effect through December 31, 2017:

*The AIA recognizes that building materials impact the environment and human health before, during, and after their use. Knowledge of the life cycle impacts of building materials is integral to improving the craft, science, and art of architecture. The AIA encourages architects to promote transparency in materials' contents and in their environmental and human health impacts.*⁹

This statement recognizes the profound connection architects have traditionally had with the materials used to realize their designs. This relationship is evident in the iconic quarry visit to select stone for cladding¹⁰ and in the myriad samples that designers typically obtain during the design of a project so that they can touch and feel the finishes they are considering. The experienced architect offers a sophisticated understanding of products: which ones are easier to procure and install; which hold up better in the field; how they reflect or refract light, transmit or block sound. Today, advances in materials science and chemistry have led to a host of qualities not traditionally considered by architects, adding to the complexity of the architect's evaluation of materials for use in buildings and sites.¹¹

The ethical imperative

Until the emergence of the late-20th-century environmental movement, there was little sense of resource limitations and ecological impacts from materials. Common considerations related to the selection of materials were focused on appearance, durability, affordability, availability and ease of installation, and cost, among others. But in today's world, and especially in the eyes of young and forward-thinking designers firms may want to attract, focusing on previously basic considerations alone is no longer enough.¹² The new AIA position on materials transparency is suggestive of several ways that architects are encouraged to respond to the ethical imperative for materials transparency, primarily by recognizing the impact of materials; seeking knowledge about materials that may include analysis by qualified material scientists, toxicologists, and others; and advocating for transparency related to those impacts. This strong urging to members is supported by Canon VI of the AIA Code of Ethics and Professional Conduct, Obligations to the Environment, which states that in performing design work and professional services, AIA Members should be environmentally responsible and advocate for sustainable building.¹³

9 www.aia.org/aiaucmp/groups/aia/documents/pdf/aias078764.pdf

10 "Quarry Visit: Understanding Limits," July 16, 2011, www.hydearchitects.com/2011/07/quarry-visit

11 For example, see "Building Science Concepts," by Ted J. Kesik, Ph.D., P.Eng., MASHRAE, www.wbdg.org/resources/buildingscienceconcepts.php, Oct. 23, 2014 (Accessed Oct. 30, 2015).

12 Malin, Nadav, "Environmentally Preferable Product Selection," *The Architect's Handbook of Professional Practice*, 14th edition, John Wiley & Sons, 2008.

13 AIA 2012 Code of Ethics & Professional Conduct

THE PLANET IS SHRINKING

We live on an increasingly crowded planet. During the 20th century alone, world population grew from an estimated 1.65 billion to over 6 billion, and as of July 1, 2015, it was at 7.35 billion.¹⁴ We also consume more resources on a per capita basis. In 1999, around 0.68 billion tons of municipal solid waste was generated per year globally, or about 1.4 pounds of waste per person per day.¹⁵ In 2009, that number rose to 1.3 billion tons, or 2.6 pounds of waste per person per day. And we're increasingly discovering that when we throw things away, there really is no "away."

More and more of the products we use are made from materials synthesized from petrochemicals. That's not necessarily a bad thing—using those hydrocarbons to make durable, useful products is much better than burning them and releasing those chemicals into the air. But we're also experimenting on the human species, and all the planet's ecosystems, as we expose ourselves to substances that did not exist throughout our evolution. At the same time, we are releasing into the environment the waste byproducts from those production processes that are sometimes persistent, bio-accumulative, and toxic.¹⁶

In many ways, we are learning that the limiting factor for our ability to continue to thrive as a species on planet Earth may not be resource limitations, but rather the inability of the planet to continue absorbing our waste. The old approach, caricatured as "the solution to pollution is dilution," is no longer viable.

REGULATIONS ARE MINIMUMS

For those who remember the conditions of air pollution and dumping that occurred prior to 1970, the Clean Air Act is a powerful example of how regulations can bring dramatic environmental improvements in every part of the country.¹⁷ Successes such as these have led some to believe that we can rely on regulations to prevent contamination of our air, water, and soils. And, in fact, the U.S. Environmental Protection Agency does promulgate laws, regulations, and compliance programs related to the construction sector to manage air and water quality, waste, and lead.¹⁸ However, any strides in these regulations must come into being amid a complex political environment where tradeoffs and compromises must be made to advance new laws. Thus the old adage that "a building built to code is the worst building allowed by law."

Chemical toxicity is arguably one of the clearest examples of where regulations have fallen behind the threat to the environment and human health. The majority of chemicals used in the U.S. market have not been screened for health effects because they were in use before the 1976 Toxic Substances Control Act; estimates say only 4 percent of the nearly 81,600 chemicals on the market have ever been screened, and only five have ever been banned.¹⁹

14 According to United Nations data, tabulated by www.worldometers.info

15 "What a Waste: A Global Review of Solid Waste Management," The World Bank, www.worldbank.org

16 BuildingGreen. "The PVC Debate: A Fresh Look," www2.buildinggreen.com/article/pvc-debate-fresh-look

17 See www2.epa.gov/clean-air-act-overview

18 See <http://www2.epa.gov/regulatory-information-sector/construction-sector-naics-23>. Accessed Oct. 30, 2015.

19 Clean Production Action. Healthy Business Strategies for Transforming the Toxic Chemical Economy. www.cleanproduction.org/static/ee_images/uploads/resources/Transforming_Toxic_Chem_Economy.pdf

Furthermore, approximately 2,000 new chemicals are introduced into U.S. commerce annually.²⁰

Regulations also depend on enabling legislation, and key laws affecting waste and chemical management, such as the Resource Conservation and Recovery Act,²¹ which has not been updated in more than three decades.

Perhaps more importantly, regulations tend to be more effective and better-enforced in developed countries like the U.S., whereas many of our products and raw materials originate in less-developed countries where such controls are less effective. Countries that set a high bar for restrictive disclosure requirements include those in the EU (REACH Standard) South Korea, and Japan (Industrial Safety and Health Law).

ARCHITECTS INFLUENCE MAJOR PURCHASING DECISIONS

As architects, we guide and direct purchasing decisions not just for our own use (like all consumers), but for the creation of human habitat for our clients, which amounts to a lot of stuff. In 2014, construction accounted for over \$1.2 trillion in gross output, or approximately 3.7 percent of the U.S. total gross domestic product (GDP).²²

That purchasing influence—and the enhanced knowledge that comes with being a licensed professional—gives architects, as the AIA Board position on materials suggests, a uniquely powerful position to consider the impact of our material choices. That applies not only to potential health impacts for our clients and other occupants of the buildings we design, but also for the greater environment—all the other creatures and their habitats affected by the inputs and outputs associated with the life cycle of the products we use.

TRANSPARENCY ENABLES IMPROVEMENT

The basic nature of the design and construction industry includes a form of economic equilibrium that is driven by the repetitive use of the same or similar materials, means, and methods. Manufacturers make large investments in their manufacturing equipment and processes as well as in training for their employees. They have confidence in existing formulations. This established practice, along with the lack of rigorous objective materials research that transparency practices would trigger, provided limited incentive to truly understand impacts or actively pursue safer options. Though many manufacturers do want to understand what is contained in their products, commodity-driven global supply chains can often interfere.²³

Obtaining credible information about the contents of building products can help architects specify products from innovative companies that have already taken steps to reduce the toxicity of their products. Publicly advocating for disclosure

20 California Department of Toxic Substances, www.dtsc.ca.gov/AssessingRisk/EmergingContaminants.cfm; for additional reading on the 1976 Toxic Substances Control Act, see also Richard Denison, "Ten Essential Elements in TSCA Reform," www.edf.org/sites/default/files/9279_Denison_10_Elements_TSCA_Reform_0.pdf

21 See www2.epa.gov/laws-regulations/summary-resource-conservation-and-recovery-act

22 U.S. Department of Commerce, www.bea.gov/industry/gdpbyind_data.htm

23 See BSR, United Nations Global Compact, "Supply Chain Sustainability, A Practical Guide For Continuous Improvement," www.bsr.org/reports/BSR_UNGC_SupplyChainReport.pdf

of that information may, in effect, greatly enhance that leverage because publicly available information can be scrutinized by experts and used to advocate for safer options, where they exist.

Some product manufacturers are reporting that, in response to requests for product contents, they have discovered ingredients in their products that they didn't even realize were there, or that they had not identified as hazardous. Once aware, some of those companies have been able to find safer alternatives. Waterproofing manufacturer PROSOCO, for example, hadn't tried to find alternatives to the potentially endocrine-disrupting phthalates in its products until the designers of the Bullitt Center in Seattle, who sought to avoid phthalates to obtain Living Building Challenge certification, asked if it was possible. The company managed not only to provide phthalate-free coatings for that project but also to make the safer formulation standard in its product lines.²⁴

Architects can bring these things to light and, with guidance from materials scientists, give consideration to the health and safety of people and ecosystems throughout the building materials supply chain as a part of their decision-making process.

The competitive edge

Firms that market their services in the areas of sustainability, resilience, and occupant well-being, or for whom high levels of environmental performance are a core value, often use certification programs such as LEED or the Living Building Challenge on their projects to add rigor to their work and to provide independent third-party validation of their achievement in these areas. Many of these certifications now specifically address materials transparency within their program.

The inclusion of transparency may be a requirement for participation in the program, as with the Red List imperative in the Living Building Challenge, or may be an option—a LEED credit, for example—that contributes to a higher score and potentially to a higher-tier certification. Specifics on how each of these programs rewards transparency are provided in Appendix O2.

Soliciting and using the information provided by product suppliers for the purpose of ascertaining conformity with the requirements of different certification programs, like other new professional tasks, must be road tested by firms for inclusion in their services to clients. Firms that currently offer their clients options to achieve certification under any of these programs, or even firms that hope to do so in the future, will want to gain experience with transparency documents like the ones discussed in Appendix O2, so that they may market these services and be prepared when requests arise.

24 "Phthalates: A Threat to Male Fertility," www.bullittcenter.org/2014/03/26/phthalates-a-threat-to-male-fertility, accessed Nov. 2, 2015.

Serving proactive clients

Some clients are not relying on third-party certification programs to drive their own procurement of safer materials and good information on product contents. It's not that these clients are eschewing those certifications, but have rather moved into this space ahead of those programs or are interested in taking their initiatives further.

The best-known company with an aggressive healthy materials program for its facilities is Google. Google has sought information from its suppliers about product contents, developed its own standards for substances to be avoided whenever possible, and even funded an initiative through the U.S. Green Building Council to harmonize and accelerate transparency initiatives.²⁵ Firms interested in offering design services to Google would clearly do well to establish some expertise in this area.

²⁵ Google Healthy Materials Selection Criteria, support.google.com/healthymaterials/answer/6106737?hl=en

The Durst Organization, based in New York City, is also very proactive when it comes to avoiding potentially hazardous ingredients. Durst has engaged with specialty consultants with industrial hygiene expertise to help parse the content of Health Product Declarations, emissions test reports, (material) safety data sheets, and other sources to identify opportunities to choose safer products.

Harmonizing the certification and declaration programs

New sources of product transparency declarations and information have emerged in the past few years, and more are being proposed. Recognizing the confusion that this surge of new information is causing in the market, several of the programs that focus on content reporting and hazard avoidance have engaged in a comprehensive harmonization effort, so that data collected for any one of their programs could serve the others.²⁶ Participants in this harmonization effort, which was convened by USGBC with funding from Google, are listed here and described in Appendix O2.

USGBC Harmonization Initiative participants:

- BIFMA International/e3 Standard
- Cradle to Cradle Products Innovation Institute
- Clean Production Action/GreenScreen for Safer Chemicals
- Healthy Building Network/Pharos
- Health Product Declaration Collaborative
- International Living Future Institute/Declare

²⁶ www2.buildinggreen.com/article/material-health-tools-harmonize

Transparency and confidential business information

Manufacturers may have valid business interests in protecting the intellectual property that goes into making products. These interests are addressed in current disclosure programs with options to reveal the function and any hazard associated with a particular substance without actually naming the substance.²⁷ Additionally, some programs allow the precise proportion of a given substance in a formulation to be concealed within a range. Some manufacturers are not comfortable with even that level of disclosure, arguing that it could allow others to discover their formulations. But others are finding that

the advantages of being transparent in terms of good will and trust with customers outweighs concerns about proprietary information being abused by competitors.²⁸

27 For example, "Health Product Declaration® Open Standard," Version 2.0, Sept. 10, 2015. Section 2.2.2.1 "Substance Name."

28 Lindsay James and Mikhail Davis, Interface, "What's in your product? Learning to love transparency" www.greenbiz.com/blog/2012/06/30/what%E2%80%99s-your-product-learning-love-transparency, accessed Nov. 2, 2015.

Durst is also leading an effort with other major NYC building owners/developers, and with academics, health advocates, sustainability consultants, and manufacturers, to pilot the use of innovative field-ready products and processes, based on material research, testing, and code evaluation. This Building Product Ecosystems: A Collaborative for Optimizing Health initiative, begun in May 2014, has made great strides in bringing new, less hazardous products and processes to the NYC market, including use of ground recycled glass such as pozzolan in concrete instead of coal fly ash (which has toxic heavy metals), and closed-loop recycling of gypsum wallboard trim scrap into new wallboard (avoiding dependency on coal-fired power plants for synthetic gypsum and salvaging this valuable scrap from landfilling with its inherent risk of generating asthma-provoking hydrogen sulfide gas), while integrating controls to safeguard the quality of the returned feedstock.²⁹

Google and Durst are pioneers in this area, but many other major corporations, real estate developers, and institutions are quickly following suit. Serving these clients increasingly requires expertise in the area of product contents and the health hazards associated with them.

Summarizing the opportunity

Engaging with manufacturers' product transparency is quickly becoming a more typical part of the architectural practice of many firms. Whether it is simply to "do the right thing," or to position yourself and your firm to fulfill client expectations, firms may want to get involved and lead this trend rather than having to play catch up later. The AIA Materials Knowledge Working Group projects that clients will increasingly look to firms for their ability to work in this area.

29 www.buildingproductecosystems.org

What's the concern? What are the risks?

A major aspect of any architectural or related practice is managing legal and financial risk—and the two are often related. No business is entirely risk-free, and the design of buildings in particular involves some degree of risk—which is the reason why architects carry professional liability insurance, and thoughtfully analyze and manage the risks of their professional practice, whether or not it is covered by insurance.

In well-established areas of practice, risk and best practices for managing risk are generally well known. These are areas where architects already have the tools to manage risk, and they can rely on those tools for building strategies in new areas. For example, best practices for marketing and offering green services, such as expertise in LEED services, were explored in a white paper prepared for the AIA Trust in 2008.³⁰ The product-content-related transparency information discussed here is just now emerging in the industry. Architects are increasingly confronted with additional, sometimes complex information about architectural products—specifically, the chemical ingredients of those products, sometimes down to the parts-per-million level, along with health-hazard classifications of the chemicals. That novelty in itself raises the specter of unfamiliar, and therefore worrisome, potential risk, and that makes a great case to rely first on risk management best practices that the firm may already employ.

³⁰ “Managing the Risks and Embracing the Benefits of Going Green,” www.theaiatrust.com/goinggreen/Green-Paper-2014-Update.pdf

Types of legal risk in practice

Legal risks much more often than not arise from either failure to meet contract obligations, or negligent error or omission in the performance of professional services. Managing the first risk—meeting contract obligations—is, in theory, relatively straightforward. It requires diligent attention to negotiating appropriate and attainable contract requirements and avoiding making marketing claims or other public pronouncements that could be construed as promises of delivering certain outcomes—and then fulfilling the contractual obligations. However, clients can and do sometimes initially require contract terms that elevate the architect's duties far above the normal standard of care, and also beyond what would be covered by professional liability insurance.

The concerns that have been raised in the context of materials transparency are mostly in the area of exposure to possible claims of negligence. In addition, there may be concern where architects are asked to agree to overreaching contract terms, such as promising a “healthy” building.

Hazard avoidance vs. risk management

Most of the initiatives and organizations advocating product content transparency are focused on identifying and avoiding hazardous substances. Hazard and exposure both have to be taken into account to calculate risk. However, it is very difficult to estimate all of the exposure pathways for inherently hazardous chemicals, and that is why many seek to reduce inherent hazard before trying to manage exposure. Other sources argue that hazard avoidance is not the best goal, and we should be looking to manage risk instead.³¹ A hazard inherent to the chemical, they argue, cannot cause harm unless someone is exposed to that hazard, and some hazardous substances perform essential functions and are difficult to replace.

Almost anything can be hazardous under certain conditions—witness the number of deaths due to drowning, proving that even a substance as essential to life as water can be hazardous. By way of example, silica dust is a hazardous material whereas glass is not. They are both made from the same material, but while one poses a direct health hazard, the other doesn't. However, it could be argued that this is a false example, since silica in the amorphous matrix of glass is not able to be inhaled or otherwise taken into the body, whereas dust certainly can be. While the hazard may not exist in the use phase for building occupants, it may impact construction workers or create larger public health concerns at the end of its life. This illustrates why disclosure with a view to the full life cycle of a building is so critical.

In response, some hazard avoidance advocates point out that managing risk may be a necessary evil in some cases; but if something is intrinsically hazardous and can be eliminated, that goal should be pursued. They assert that a more nuanced risk assessment-based approach may potentially add unnecessary complexity.³² While a risk-based approach may be feasible if one is concerned about potential exposures on the part of end users of a product (or occupants of a building), when one is also concerned about exposures by people and other species throughout a product's entire life cycle, eliminating unnecessary hazards looks reasonable as a proactive approach, rather than assessing and managing risks in a reactionary or defensive posture. Cost is an important factor in risk management and hazard avoidance, recalling the old maxim "An ounce of prevention is worth a pound of cure." And in a true life-cycle approach, this includes the entire cost of a product, not just the initial cost.³³

31 www2.buildinggreen.com/article/chemical-ingredients-building-products-what-do-you-really-need-know

32 Walsh, Bill, "Where Is The US Green Building Council LEEDing Us? Trade Associations Draw The Map," www.healthybuilding.net/news/2005/01/10/where-is-the-us-green-building-council-leeding-us-trade-associations-draw-the-map, accessed Oct. 27, 2015.

33 See "AIA Guide to Building Lifecycle Assessment in Practice," www.aia.org/aiaucmp/groups/aia/documents/pdf/aia082942.pdf

WHAT WILL INSURANCE COVER?

Professional liability insurance is one of the tools that architects will use to manage the risks of practice related to materials transparency. Therefore, they will need to understand what coverage their professional liability insurance policy does—and does not—afford. Because materials transparency is a new area of practice, many professional liability insurers have not yet formulated a response to it.³⁴ Professional liability insurance policies are not standardized—they are all different—so coverage for any particular situation will depend on the language of the applicable policy and the insurer's interpretation of that language. Generally speaking, however, professional liability policies provide coverage for negligent performance of professional services. To be covered, a claim must allege negligence on the part of the architect, and the architect's services must fall within the policy definition of professional services.

34 Correspondence with professional liability insurance carrier, Oct. 7, 2015.

If and when actual claims do emerge, insurers will determine whether they need to respond with changes to insurance rates and/or policy coverage. If claims experience should become particularly adverse, some professional liability insurers might consider excluding coverage for certain types of claims arising out of materials transparency services, or offering a limited amount of coverage for such claims, say, by establishing a “sub-limit” lower than the full policy limit for such claims. Insurers who take such steps might be willing to offer insureds the ability to “buy back” such coverage for additional premium.

For this reason, it is important that the architects keep their professional liability insurance broker apprised of their activities in the area of materials transparency. Architects should make sure that they are aware of any changes to the scope of their coverage, including changes to the definition of professional services and any new coverage limitations or exclusions. They will also want to discuss with their broker and/or insurer how the insurer interprets its policy language with respect to materials transparency services and claims.

It is important to bear in mind that architects’ professional liability insurance is typically written on a “claims-made” basis—it is not “occurrence-based.”³⁵ This means the policy that will apply to a claim is the one that is in place at the time the claim is made and reported to the insurer—which is not necessarily the policy that was in force at the time the services were performed. In fact, claims may be made years after a project was completed.

35 Correspondence with professional liability insurance carrier, Oct. 13, 2015.

For this reason, it is imperative for architects to ask their broker and/or insurer about how their policy will handle coverage for materials transparency claims *every time they renew their policy*. If the incumbent carrier proposes to restrict coverage upon renewal, the architect will need to have its broker explore other options that might offer broader coverage for its materials transparency services. And as little as anyone likes completing a professional liability insurance application, this is one argument for getting it done and to the broker as early as possible, so that the search for new coverage can, if necessary, be undertaken and completed before renewal time.

Therefore, even if a firm ceased engaging with material transparency on its projects, it may have to retain an insurance policy with broader coverage for years afterwards in order to be covered.

Potential transparency-related negligence claims

The following are several types of risk associated with materials transparency work. It is worth noting that these risks *can* be managed, often with tools already very familiar to architects. Some of those solutions are described in the next section.

One hypothetical scenario that is of concern to architects and their legal counsel could look like this: a building occupant develops a health condition which he or she claims is due to exposure to a substance found in a product specified by an architect. If there is documented evidence that the architect was aware of the presence of the hazardous substance in the specified product—because he or she reviewed the disclosure document and specified the product anyway—an argument could be made that the architect had a duty not to specify the product containing the hazardous substance.

Of course, that issue exists now, even in the absence of HPDs, where a substance is notoriously bad for human health (asbestos, PCBs, etc.). When architects knowingly specify a product containing notoriously bad substances, it may be argued that they have breached a duty to the public generally to protect the health, safety and welfare. Architects are already familiar with risks similar to those described here, and the solutions described in section 4 are based on what architects already do as best practices, effectively employing insurance, communications and contract language.

Manufacturers are traditionally liable for any problems arising from the content of their products. They are the ones who are placing the hazard into the “stream of commerce,” and will be held ultimately responsible if someone gets hurt in an actionable way. But there is a risk that by the time the product problem manifests, the manufacturer may be unreachable, out of business, or otherwise judgment-proof.

This concern is exacerbated by the potential size of health-related judgments, the expense and difficulty in defending these cases, and potential injury to the reputation of the firm. Damages for personal injury can be much larger than the damages architects might face in design and construction defect cases, as illustrated by the liabilities relating to asbestos that drove large companies into bankruptcy. Even though the liability of the architect may be less clear than that of other parties, *any* claim can generate significant legal fees for the defendant, but especially those related to personal injury claims—whether settled, litigated, or resolved through alternative dispute resolution.

Strategies for managing risk while encouraging transparency

Play to existing strengths: insurance, contracts and communication

Concerns about materials transparency-related claims, while still hypothetical as no health claim related to engaging with transparency documents has yet been tested in court, are still reasonable to consider. The bottom line is that because the potential for claims represents a risk to architects that provide services related to material transparency, it makes sense for architects to be smart about how they handle that engagement, both through contract language and communication with clients. Architects should also ask their broker and/or insurer about how their policy will handle coverage for materials transparency claims, so they know where they stand, and do so each time they renew their policy, given the claims-made nature of the coverage. Both contract language and communication are the focus of new guidance from the AIA Document B503™ – 2007: Guide for Amendments to AIA Owner-Architect Agreements, and of the following sections of this paper.

It is not unlikely that, before long, information about product contents and their possible health hazards will be widely available, and knowledge of such substances will be expected. If or when that happens, not using disclosure documents could become more of a liability than using them. However, it may be years before transparency-related claims are tested in court, and before any impacts on professional liability insurance coverage are known. Efforts to advance transparency do not have to be stymied by this uncertainty, but in the meantime architects would be wise to take specific steps to avoid exposing themselves to undue liability by discussing the concept with their professional liability carrier and legal counsel, considering specific contract language that defines or limits their responsibility, and other approaches, such as seeking informed consent and a waiver of damages related to the review and acceptance of materials.³⁶ These are tools and techniques that architects already use to manage risk in their practice.

Regarding knowledge of materials content, it makes little sense for an architect to try to actively ignore the existence of information regarding known human health impacts, or other strong evidence of human health impacts where that information is widely known. Eventually, it may even be “negligent” to be unaware of such information. What *is* known is that we sit at the cusp of a revolution in transparency, where information regarding the material composition of building materials will be commonly known. The question is, what will architects do with that information?, and, what is the reasonable expectation of the public with respect to what architects will do with that information?

³⁶ See generally www.theaiatrust.com/find-out-the-risks-and-benefits-of-going-green.

In its Management Advisory, “Health Product Declarations and Sustainability Risks for Design Professionals,” Victor O. Schinnerer & Company suggests strategies for handling the risks associated with materials transparency in architectural practice. Starting with acknowledgment that the role of the design team in the evaluation of health declarations is limited, the advisory states, “No project owner should expect a design professional to independently verify the claims of manufacturers.” Though architects have always had some responsibility for products research, human health impacts are particularly difficult to assess, and there is a lack of standard definitions in the industry for product ingredients disclosure. The company asserts that the contract between the design professional and the project owner should provide that the design professional “must be able to rely on the declarations made by manufacturers...and does not take responsibility for such declarations.” And although it maintains that the use of tools related to life-cycle assessment, HPDs, and product certifications does not automatically increase the design professional’s risk, the advisory notes the importance of educating owners that the design professional is not responsible for verifying the veracity of manufacturers’ reports.³⁷

At a minimum, being deliberate about communicating intentions and limitations to other members of the project team, clearly defining areas of expertise and responsibility, and fully discussing these issues with insurance carriers and counsel are recommended. This includes being careful and explicit about promises made in contracts with the owner. In particular, it is important to avoid making guarantees about outcomes, to properly document product selection decisions, and, where appropriate, to encourage the owner to engage qualified consultants with demonstrated health and toxicology expertise. Each area is explored in more detail below.

Provide clear, consistent communication with clients

If architects ask for disclosure of product contents without explaining why they are asking, owners may assume that the architect is fully knowledgeable and plans to use that technical information to inform their product recommendation or specifications. This is an area for caution, and the AIA Materials Knowledge Working Group has outlined several key points architects should articulate with clients in an article titled “Materials Transparency: Managing Risk, Seizing Opportunity,” which will be expanded upon here.³⁸

Whether the use of transparency documentation is a client demand or initiated by the architect, there are several points that should be communicated. Several of these points are covered in the contract language proposed in the AIA Guide for Amendments to AIA Owner-Architect Agreements: Document B503™ – 2007, and should also be discussed between owner and architect before the

³⁷ “Health Product Declarations and Sustainability Risks for Design Professionals,” Management Advisory, Victor O. Schinnerer & Company, <http://www.schinnerer.com/AE/Pages/Management-Advisories.aspx>

³⁸ “Materials Transparency: Managing Risk, Seizing Opportunity,” www.aia.org

contract is signed. Prior to a discussion with the client, and prior to making any commitments to the client, the architect should discuss its specific materials transparency efforts with insurance and legal counsel.

EXPLAIN YOUR INTENT

Architects are not trained to conduct sophisticated analyses regarding toxicity and health hazards of substances. Yet without a clear statement to the contrary, clients and others may well assume that in requesting disclosure documents from suppliers, the architect intends to analyze the contents of those documents for problematic substances and potential health or environmental concerns, and may subsequently seek to hold the architect accountable for any issues that might arise. Clients with unrealistic expectations of what the architect and materials transparency can do for them should be educated about the limitations of the architect's ability and the reach of materials transparency. Clarifying statements should be included in the owner-architect agreement, in the architect's marketing materials, and in communications between the architect and the client throughout the project. This is a critical concern for the contract, where additional duties beyond basic services may be introduced—and for the profession, presenting a potential for a change in the standard of care. To address this type of risk, architects should be explicit in contract, marketing, and client communications about their intent in soliciting those documents. Several potential motivations include:

1. To minimize the negative impacts of the built environment on human and environmental health by exposing unnecessarily risky choices to the market at large;
2. To create natural market competition among building manufacturers, to phase out chemicals identified by recognized authorities as being highly hazardous; and
3. To promote the advancement of human and environmental health as one of the many factors architects use to evaluate products.

Further, the most fundamental reason may well be simply to help reduce hazardous substances in products: the mere act of seeking disclosure documents drives manufacturers to look at their supply chain and, when appropriate, seek alternatives to problematic ingredients. The motivations listed above can create context for these important conversations and are explored in more detail below, segmented according to the varying interests and needs of different clients.

DO NOT GUARANTEE THE ACCURACY OF DATA

Disclosure documents such as Health Product Declarations and Declare labels are created by product manufacturers, assisted at times by outside consultants. They may, in some cases, be verified by independent third parties, which bear the responsibility of determining whether the claims of the manufacturer are accurate.³⁹

Despite the best efforts of the entities that support these reporting formats, and despite the good intentions of most manufacturers, there are myriad ways disclosure documents could turn out to be inaccurate. Actual product contents may not match precisely the description in the disclosure document. The information in the document could be incomplete, out of date, or erroneous. The document could even be mislabeled as applying to a particular product when it applies instead to a different one. In any of these scenarios, the architect does not have any way to verify the information independently; without training or experience in toxicology he or she is only able to take the data at face value.⁴⁰

As disclosure documents continue to evolve, quality control measures are being integrated into the process. For example, the HPD Collaborative offers manufacturers a Checklist for a Compliant HPD to confirm that their entries are accurately completed. Automated functions within the forms reduce the opportunity for user error; for example, when the manufacturer inputs the chemical identification, the associated HPD Priority list classifications are automatically populated, as are the GreenScreen List Translator classifications and, when available, full GreenScreen Assessments.

However, even if the product contents are listed accurately, the identification of potential health hazards associated with those contents—which is a key element in some disclosure documents—may not be comprehensive or definitive. There is room for interpretation and opportunity for error in assigning some hazard ratings. Perhaps more importantly, there is significant debate regarding the degree and nature of hazard from some substances as the science evolves over time, while hazard assessments can only rely on the best information available at the time.⁴¹ Within the scientific method of testing hypotheses and seeking repeated results, findings may approach certainty, but never reach it absolutely.

The architect cannot and must not guarantee that the product for which transparency documents were obtained, and which was ultimately specified, will be the product that is actually installed. While the architect is expected to follow the standard of care for construction observation and work with the contractor in a reasonable manner to prevent mistakes, architects are not trained to conduct product testing, nor do they have the capacity to verify every product installed, and this level of expertise is not part of the architect's standard.

³⁹ See <http://www.schinnerer.com/AE/Pages/Management-Advisories.aspx>

⁴⁰ For additional reading on truth in labeling, see FTC Green Guides, www.ftc.gov/news-events/media-releases/truth-advertising/green-guides

⁴¹ Comparison of Hazard Communication Requirements: OSHA Hazard Communication Standard 29 CFR 1910.1200 (HCS); Globally Harmonized System (GHS), "Hazard Determination/Classification Provisions," www.osha.gov/dsg/hazcom/ghosha-comparison.html, accessed Nov. 2, 2015.

Responsibility for the quality of the disclosure documents, the composition of the products, and the health-related classifications of the ingredients of those products lies elsewhere, and not with the architect. It is important to ensure that clients are aware of those facts.

REMINDING CLIENTS THAT PRODUCT CONTENT IS ONE FACTOR AMONG MANY

Product selection is already often a juggle between multiple tradeoffs: aesthetics, cost, durability, availability, compatibility, and, now, product content. Although an important factor—especially to a client that has expressed interest in reducing health hazards—information in a disclosure document should not necessarily overrule other factors, especially where the client has expressed different priorities. It is important to explain to the client that an architect may select a product that contains a hazardous substance in order to meet some other project requirement, as long as it is in line with the expressed goals of the project. This informed consent should be secured in writing. If the client has any interest in the matter, or where the decision is an important one that relates to cost, schedule, or liability of the client, then such decisions should be made in consultation with the client, and those discussions fully documented.

MANAGING RISKS WITH CLIENTS WHO ARE NOT ENGAGED

The Materials Knowledge Working Group came to the conclusion that an architect does not have to abandon efforts to promote material transparency if the client is not initially engaged with issues of health and toxicity of building products, but this situation may call for a different approach that is respectful of the client's priorities.

With clients who are not engaged with material transparency at the outset of the project, architects can begin a dialogue by explaining the value of transparency as a means to release information needed to encourage the use of safer substances. Simply asking questions about the ingredients in a product drives manufacturers to look at their supply chains, where they themselves might find an opportunity to substitute a safer substance. Even if information on disclosure documents is not used to inform product choices, asking for it creates a demand for it, which in turn makes it possible for third parties to provide better-informed guidance.

The manufacturer-centered rationale may be the basis for a firm-wide policy to pursue transparency documents on every project. As long as the architect does not compromise other goals—by increasing cost, delaying project completion, or limiting aesthetic options based on the results of the disclosure documents, for example—the architect does not need express permission of the owner to pursue transparency documents. Model contract language is included in the

AIA Guide for Amendments to AIA Owner–Architect Agreements: Document B503™ – 2007 for instances in which the owner does not include an obligation to address materials transparency but the architect has adopted a firm policy or committed to promote materials transparency in general. In such a scenario, an architect should pay special attention to AIA’s Code of Ethics (2012) Rule 3.103, which requires that members “shall not materially alter the scope or objectives of a project without the client’s consent.”⁴²

⁴² www.aia.org/aiaucmp/groups/aia/documents/pdf/aiap074122.pdf

A firm-wide policy to request transparency documents makes material transparency the status quo in the eyes of the client, and would likely open the door to utilizing disclosure documents for product selection on more projects, as clients realize they might as well exploit the fruit of this built-in labor. However, as obtaining transparency documents becomes the norm, it is all the more important to educate design staff and emphasize to the client the limitations on the architect’s work in this area.

Architects should never state that they can deliver a “healthy” building, or imply that disclosure information will allow them to make health or toxicological assessments of a product, such as whether a certain substance presents an exposure risk or not. Architects are neither educated nor trained in making such determinations, or providing such assurances. However, with appropriate conditions in the contract that establish the owner’s understanding of *why* transparency documents are being obtained, an architect can seek materials transparency with manufacturers over the course of a project.

MANAGING RISK WITH CLIENTS WHO EXPRESS SOME INTEREST

If the client has not explicitly expressed interest in materials transparency but is interested in the market opportunities that are presented by pursuing a building label or rating system, the architect can suggest a program that offers both benefits. These building rating systems may directly encourage product content transparency, or encourage the use of products that are free of certain “red list” substances, which can largely be ascertained through transparency declarations. The three leading North American programs with these features—LEED version 4, Living Building Challenge, and WELL—are described in Appendix O1, with details on how they each address transparency. Outside the U.S. many rating systems already require material health information, demonstrating that the trend is now worldwide.

If LEED v4 certification is pursued, for example, then the architect could suggest the Material Ingredients credit as way to help achieve that certification, and encourage the solicitation of disclosure documents for that purpose. Requests for disclosure documents should reference the architect’s and client’s mutual desire to meet the requirements of LEED v4 Material Ingredients credit

(see Appendix O2 for details), and explicitly state in writing that the architect will make no judgment as to the accuracy or health impacts of manufacturer-supplied data or health impacts of contents listed.

It also may be possible to connect materials transparency efforts to other goals besides LEED certification; for example, if the client has personal or corporate values to uphold that are aligned with this effort. An architect may be able to advocate for the review of disclosure documents if the client is attuned to public health or corporate transparency issues, in which case third-party review is essential.

If even that is a stretch, the client might be receptive to the argument that materials transparency is a clear market trend, and those that ignore it may be left behind in a marketplace which may soon demand it. According to the American Society of Interior Designers' "Interior Design 2015/2016 Outlook and State of the Industry," health and wellness is currently the most influential industry trend.⁴³ If building owners do not take steps to limit harmful substances in their buildings, they might in the future have trouble finding or keeping long-term tenants.

43 www.asid.org

MANAGING RISK WITH CLIENTS WHO ARE PROACTIVE

What if your client does not need to be convinced, and the call for transparency declarations comes from them—does that mean you don't need to think about risk management?

Not so fast. Clients who feel strongly about material transparency might have unreasonable expectations and push for "guarantees" that architects must not make. As always, architects must be proactive about managing client expectations to avoid client problems and professional liability claims.

In this case, the most important step is to define clear goals and directives that can be included in the Owner's Project Requirements Document. This is not a place for taking on vague and unverifiable objectives, such as designing a "healthy" building. When clients express such broad and unclear goals, it is an opportunity to engage them in defining what exactly they want to accomplish, and what is reasonably required to determine that they have achieved it.

If the client has materials goals that are different from or exceed what is prescribed in an established rating system, the architect should recommend that the owner contract directly with health consultants, such as industrial hygienists or toxicologists, to clearly define goals related to materials. These professionals are able to set priorities for chemicals to avoid and provide advice about the merits of various health and environmental impact lists.

If a custom “red list” is created by a consultant, the architect can attempt to avoid or minimize those substances in material selection. However, it should be acknowledged that the architect is not trained to evaluate chemical composition and may unknowingly specify a product that contains one or more of those undesirable substances if it is not expressly included in the manufacturer’s disclosure documents. Professional toxicologists or Certified Industrial Hygienists (CIHs), who are trained to make such materials composition assessments, may be hired by the owner to assist the architect in any close calls. Comparisons between products, based on relative quantities of multiple chemicals of concern, or recommendations about which products have the least health or environmental impacts in terms of severity or risk of exposure, must also come from the consultant.

Working with consultants

As efforts to promote and interpret disclosure documents develop, and more clients join the “proactive” category in terms of adoption, architects will likely begin working with consultants such as toxicologists and CIHs with whom they may not have worked before. Working with this new field of professionals brings up some key questions: What kind of claims can they make that an architect cannot? How do you know if they are qualified? How are they insured? While the architect should not contract with these consultants directly, in order to avoid being in the liability chain relating to their specialized work, architects may find themselves working in collaboration with them when the consultants are hired by an owner.

CERTIFIED INDUSTRIAL HYGIENISTS

The term “industrial hygienist” has not been restricted by law, so anyone, regardless of knowledge and competency, can call themselves an “industrial hygienist.” Therefore, this discussion will focus on the title of Certified Industrial Hygienist (CIH). The CIH program has been accredited by the American National Standards Institute (ANSI) and the National Commission for Certifying Agencies (NCCA), and is administered by the American Board of Industrial Hygiene.

CIHs are scientists and/or engineers trained in the discipline of anticipating, recognizing, evaluating, preventing, and controlling health and safety hazards. These skills come from a combination of education, training, and, often, supervised experience. They anticipate when a hazardous condition may occur, and then evaluate and recommend corrective action to control exposure.

With this training, they can help an owner and architect understand which chemicals within building products are the highest priorities from the

perspective of both inherent hazard—to humans and ecosystems throughout the supply chain—and the potential for occupant exposure in the completed building. CIHs can review disclosure documents and related technical data (such as safety data sheets) and assess chemical and physical properties to determine the potential for emissions and fiber release.

CIHs can work with contractors to address risks to installers, often conducting in-field testing to measure chemical exposures against enforceable OSHA limits, and as a best practice keep apprised of OSHA Alerts. Risk assessment is an essential part of the CIH's practice. Therefore, they may be able to translate chemical data into plain English, helping owners and contractors understand the nature of the chemical hazard, engage in a comparative analysis of different building products (with the chemical ingredient information being just one aspect of what the architect is considering), and recommend engineering or other site controls to minimize exposures during product installation.

CIHs can also serve as a conversant liaison with the environmental health and safety, regulatory affairs, and R&D departments of the manufacturers, representing the interest of the architect or client in developing a deeper understanding of the composition of the building materials and assemblies, internal testing and reporting methods, and options for inherently safer material choices. Some CIHs are able to provide detailed technical reviews of product emissions reports and quality control checks of disclosure documents.

A CIH must meet minimum requirements of science/engineering education and applied experience, obtain professional references, and then, through examination via the ABIH, demonstrate knowledge and skills in a broad range of subject matter, including: air sampling and instrumentation, analytical chemistry, basic science, biohazards, biostatistics and epidemiology, community exposure, engineering controls/ventilation, ergonomics, health risk analysis and hazard communication, industrial hygiene program management, noise, non-engineering controls, radiation, thermal stressors, toxicology, work environments, and industrial processes.

Every five years CIHs must document to the ABIH that they have engaged in professional development to keep their skills current; such documentation is subject to audit. Like architects, CIHs are bound to a code of ethics which obligates them to give priority to health and safety interests related to protecting people, and to act in a manner that promotes integrity and reflects positively on the profession, consistent with accepted moral, ethical, and legal standards.⁴⁴

⁴⁴ www.abih.org/become-certified/eligibility

TOXICOLOGISTS

A toxicologist is trained to evaluate adverse effects of chemical, biological, and physical agents on humans, animals, and/or organisms in the environment (e.g., fish, insects, etc.). Like industrial hygienists, the professional title “toxicologist” is not restricted by law, so this discussion will focus on qualifications of toxicologists who have been accredited under one or more professional accreditation schemes specific to the practice of toxicology.

There are a variety of certifications for toxicologists in the United States, with the most highly regarded being through the American Board of Toxicology. Toxicologists certified through this board are identified as Diplomates of the American Board of Toxicology (D.A.B.T.). Approximately 2,000 toxicologists worldwide are D.A.B.T.-certified. These professionals currently engage in tasks such as:

- the design and interpretation of safety studies for product development;
- reviewing materials and products for compliance with regulations;
- conducting primary research on the toxic effects of substances; and
- assessing human health hazards or risks posed by chemicals, materials, or products.

Other certifications, such as the Certification for Industrial Environmental Toxicologist through the National Registry of Environmental Professionals, require fewer years of formal education but still issue a test for “basic knowledge of environmental toxicology.” These professionals might have more limited ability to issue guidance and may or may not be covered under insurance.

Toxicologists qualified to assess health hazards and evaluate risks associated with building products and materials have expertise in the following areas:

- An understanding of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), including assessing hazards of the 16 physical, 10 health, and three environmental hazard classes that comprise GHS;
- Experience assessing hazards and quantifying subsequent health risks from chemicals used in building materials at various life-cycle stages (e.g., production, installation, and use) following various routes of exposure (primarily inhalation and dermal contact);
- A solid understanding of the types of inorganic and organic chemicals and functional classes of chemicals used in building materials and products, including a solid understanding of polymer chemistry;

- Composition of state, national, and international regulatory lists for chemicals of concern (e.g., the European Chemicals Agency’s list of Substances of Very High Concern, California’s Proposition 65); and
- Expertise preparing and executing material optimization plans for architects and builders, including screening materials and products that have existing HPDs, Cradle to Cradle Certifications, and low-VOC content or emission certifications (for example, Greenguard and BIFMA).

Toxicologists often work with material suppliers on behalf of architects to proactively reduce the presence of hazardous materials in building materials and products. This service promotes the concept of informed substitution, which is defined as the replacement of chemicals of concern with safer chemicals or other alternatives.

INSURANCE FOR SPECIALTY CONSULTANTS

CIHs and toxicologists working as independent contractors may or may not be covered by their own commercial general liability policy and/or a professional liability policy. The American Industrial Hygiene Association (AIHA) provides insurance information for CIHs through their membership portal.⁴⁵ Individual consultants may obtain professional liability insurance through the AIHA-affiliated insurance provider or through independent insurance companies. Individual toxicologists may obtain professional liability insurance through independent insurance companies, or, if they are members of the American Chemical Society (ACS), sign up for professional liability insurance through a program managed by the ACS. CIHs and toxicologists who are employees of an engineering, scientific, or environmental services firm may be covered by the firm’s Errors & Omissions insurance.

⁴⁵ www.aiha.org/publications-and-resources/buyers-guide/Pages/Professional-Liability-Insurance.aspx

An architect cannot take any responsibility to ensure that any Certified Industrial Hygienist or certified toxicologist they work with are separately insured, and must be clear that the consultant has contracted directly with the owner, rather than as subcontractors under the architecture firm. If a dispute arises, the injured party does not have to engage the architect as a defendant to pursue a cause of action originating with a subcontractor, and the architect does not have to rely on its own professional liability insurance (which may or may not include material hazards assessment by other parties in the scope of architects’ professional services) to cover defense fees. An owner may demand a certificate of insurance from each independent consultant that clearly identifies the date of insurance coverage and the limits of liability coverage.

In conclusion: be proactive about potential risks

Because the law differs from jurisdiction to jurisdiction, architects face a complex legal landscape. Although there do not seem to be any current claims related to material transparency documents, we live in a litigious society. The strategies reviewed in this report aim to help architects manage their risk of such claims, and better position themselves to defend against them in the event that they arise.

A court complaint related to material transparency documentation would probably assert either a breach of a contract or negligence by the architect. Effective risk management may be key to successfully defending against a claim in litigation. Because even a meritless claim may result in substantial legal fees and other costs in a court case, however, the architect's first line of defense may be to resolve or even prevent claims before they reach that point. His or her lawyer or insurer will be best able to advise about that.

An architect's level of duty to third parties such as occupants (as defined by the law) has traditionally been narrower than the architect's duty to the client.⁴⁶ That notwithstanding, there are cases in which courts have found architects negligent where they failed to prevent foreseeable harm to building occupants. This presents a special risk management challenge here for architects, who do not have the expertise to predict harm from disclosure documents. Although this risk cannot be eliminated entirely, architects may at least be able to reduce it by including appropriate provisions in contracts with their clients, and by working closely with health consultants where disclosure documents may raise issues.

It is too early to say how risks related to material transparency may affect insurance coverage and costs. In the short term, premiums seem unlikely to rise unless there is a trend of court cases alleging negligence by architects related to material transparency documents. Even then, there might be compromises between making exclusions and increasing premiums for full coverage. Only the future will reveal to what extent material transparency documents may introduce more risk for architects. This is one reason it is important to stay in touch with one's insurance carrier and maintain knowledge of what is and what is not covered in order to make informed decisions about risk.

⁴⁶ Brodie Stephens, Esq. "HPD: Hazard or Risk?" aiaa.aia.org/courses/hpd-hazard-or-risk

While claims prevention is important, the strategies recommended in this paper do much more. Effective, consistent, and clear communications with clients, along with documentation like contracts and marketing materials help to ensure that clients understand what the architect is doing with materials transparency. This is intended to increase client satisfaction, prevent claims, and make defensible those that do arise. Collectively, these techniques will aid the materials transparency movement.

Despite the unknowns, what we do know suggests architects should be ready to engage with transparency documents and to take a role in pursuing this effort with manufacturers. Access to this information marks a new opportunity to connect our material choices to the health and environmental impacts that we acknowledge are increasingly pressing—and to take action to mitigate those impacts. As the profession steps into this new territory, the best way to mitigate any risks involved with being sued is to take thoughtful and thorough precautionary steps to manage potential risks. Finally, we should remember the original reason for taking on this subject—that if efforts to promote materials transparency succeed in removing unnecessary hazards from the building materials supply chain, we will all be better for it, both in terms of physical safety, and with regard to the legal issues we all face as practicing architects.

Appendices

Appendix OI:

Building certification programs driving transparency

LEED version 4 Building products disclosure & optimization: material ingredients credit

LEED is a building certification program owned and managed by the U.S. Green Building Council, a nonprofit association with a large base of member organizations. The LEED rating system is developed by volunteers and staff, and approved by ballot of a voting body made up of members. Certifications of LEED projects and accreditation of LEED professionals are handled by USGBC's sister organization, Green Business Certification, Inc. (GBCI).

The rating system consists of prerequisites, that all projects must achieve to become certified, and optional credits. A project's certification level, which may be certified, silver, gold, or platinum, is determined by the number of points achieved from within those optional credits.

There are variants and adaptations of LEED to address a wide range of building types, from single-family homes to commercial office buildings, schools, hospitals, and retail establishments, and even entire neighborhoods. There are also separate versions to certify newly constructed or renovated projects, as opposed to existing buildings.

RELEVANCE OF DISCLOSURE DOCUMENTS IN LEED

LEED version 4, released in November 2013, includes credits that didn't exist in prior versions of LEED, including some that incentivize engaging with transparency documents. Use of LEED v4 is optional for projects seeking LEED certification until October 2016, at which time the prior version of LEED will no longer be open for new project registrations.

LEED's collection of prerequisites and credits are organized into several categories, such as "Sustainable Sites," "Energy Efficiency," and "Materials and Resources." Of particular relevance here are the three new "Disclosure & Optimization" credits in the Materials & Resources category, and especially the one subtitled "Material Ingredients."

All three "Disclosure & Optimization" credits have this stated intent: "To encourage the use of **products and materials for which life-cycle information is available and that have environmentally, economically, and socially preferable life-cycle impacts.**" The Material Ingredients credit additionally seeks: "To reward project teams for selecting products for which the chemical ingredients in the product are inventoried using an accepted methodology and for selecting **products verified to minimize the use and generation of harmful substances.** To reward raw material manufacturers who produce products verified to have improved life-cycle impacts."

IMPLICATIONS FOR ARCHITECTS WORKING WITH DISCLOSURE DOCUMENTS

For the “Disclosure” part of the credit, providing only LEED v4-compliant Health Product Declarations and/or manufacturer-supplied content inventories is sufficient; there is no need to assess the contents of those declarations beyond ascertaining that they are sufficiently comprehensive and completed in a way that meets the LEED requirements, which can be a daunting task for an architect.

For the Optimization part of the credit, assessing that product contents do not include substances of interest, as defined by GreenScreen, may be necessary. Any such substances would be flagged in the declaration, so no special toxicology training is needed for this review. However, this review should be accompanied by a clear disclaimer that it is limited to reviewing the information provided by the manufacturer and flagged on the declaration, and that the architect is making no representation that the information provided in that way is complete or accurate.

www.usgbc.org/credits

Living Building Challenge Red List

Living Building Challenge (LBC) is a certification program owned and managed by the International Living Future Institute (ILFI). LBC is developed and managed by ILFI staff; members are encouraged to provide feedback on the program but do not participate directly in writing or approving it.

LBC version 3 includes 20 “imperatives” organized into seven “petals” (using the metaphor of a flower to organize the system’s requirements). Unlike LEED, with its array of prerequisites (mandatory measures) and credits (optional measures), for full LBC certification all imperatives are mandatory. The program does also allow for “petal certification,” which affords a project recognition for achieving the imperatives of some, but not all, of the petals.

RELEVANCE OF DISCLOSURE DOCUMENTS IN LBC

The part of LBC that involves the use of disclosure documents is the “Materials Red List” imperative in the Materials petal. The Materials Red List contains a list of 22 substances that are to be avoided in the products and materials used to build a LBC project.⁴⁷ Because some of the items on this list describe families of chemicals, the actual number of specific substances as identified at the individual chemical level is much larger.

⁴⁷ living-future.org/redlist

This imperative is linked with ILFI's Declare program (see Appendix O2), which encourages manufacturers to reveal the contents of their products, and indicate if any of those contents run afoul of the Red List.

Recognizing that for some applications it isn't feasible to entirely avoid all these substances, LBC provides some "temporary exceptions" that allow project teams to use products with red-listed substances as long as they document their efforts to find "Red List-free" alternatives and write to manufacturers expressing their interest in obtaining such alternatives in the future. Products that are not Red List-free but allowed under a temporary exception are deemed "LBC-compliant."

IMPLICATIONS FOR ARCHITECTS WORKING WITH DISCLOSURE DOCUMENTS

Any project seeking full LBC certification or Materials Petal certification must comply with the LBC Red List. To support this effort, architects and their consultants must obtain either product content information from every supplier or affidavits from the manufacturer stating that the product being specified is Red List-free.

Information about product contents in relation to the Red List can be found in listings in ILFI's Declare database, manufacturer-supplied information, transparency declarations, and third-party resources such as BuildingGreen.com and Pharos. Clients should be advised that the architect's work in screening for Red List contents is subject to the accuracy and completeness of those resources, and that the architect makes no representation as to that accuracy or completeness.

The architect must also ensure that the client understands the difference between Red List-free products and LBC-compliant products, and signs off on the use of the latter when necessary, as those products will contain red-listed substances.

www.living-future.org

WELL

WELL is a relatively new building certification program focused on measures that optimize occupant health. It is owned by the International WELL Building Institute (IWBI) and managed by Green Business Certification, Inc. (GBCI)—the organization that also manages LEED certifications and accreditations.

The commercially available version of WELL serves commercial offices with whole building, core and shell, and tenant-improvement versions. Other building types are currently being pilot-tested. WELL offers three levels of certification: silver, gold, and platinum.

WELL is structured similarly to LEED, except that its mandatory measures are called “preconditions,” and its optional features are “optimizations.” These mandatory and optional features are organized into seven “Concepts,” including “Air,” “Water,” and “Mind.”

RELEVANCE OF DISCLOSURE DOCUMENTS IN WELL

There are no transparency-related preconditions in WELL, but there are three optimizations. Clients seeking WELL certification may want to pursue one or more of them, if only to achieve a desired certification level. The three relevant optimizations are:

- Toxic Material Reduction: rewards projects that avoid certain substances in specific applications.
- Enhanced Material Safety: rewards projects that either meet all the imperatives in the Living Building Challenge Materials Petal or use products that are documented to contain no identified highly hazardous substances for at least 25 percent of their products by cost. The latter option references Cradle to Cradle, Health Product Declarations, and GreenScreen, which are described in Appendix O3.
- Material Transparency: rewards projects that use products with disclosed ingredients for at least 50 percent of their products by cost. Disclosure options include Health Product Declarations and Declare.

IMPLICATIONS FOR ARCHITECTS WORKING WITH DISCLOSURE DOCUMENTS

The architect’s work helping the client meet each of these optimizations is different. For Toxic Materials Reduction, the architect can use disclosure documents to check for the presence of any of the banned substances, with appropriate caveats about how the architect is not responsible for the accuracy of the

information in the documents. A safer approach would be to obtain an affidavit from the manufacturer regarding the absence of any of the listed substances.

For Enhanced Material Safety, the approach under the first option would be as described above for the LBC Red List. For the second option, third-party certifications such as Cradle to Cradle can be used in combination with disclosure documents. The architect will need to understand how to check for ingredients at a particular hazard level within those documents, and to ensure that the client understands the architect's limitation of responsibility for the quality and comprehensiveness of that information.

For Material Transparency, the architect's job is limited to obtaining the relevant disclosure document and providing it to the client; no review of the document is necessary.

For all three optimizations the certification process may require letters of assurance from the architect that the requirements have been met. Any such letters should be reviewed by counsel and contain appropriate caveats regarding the architect's ability to verify information in the disclosure documents.

www.wellcertified.com

Appendix 02: Product transparency declaration and certification programs⁴⁸

Health Product Declaration Collaborative (HPDC)

HPDC is a private nonprofit with bylaws designed to ensure that users of the information control the Health Product Declaration (HPD) reporting standard (as opposed to product suppliers). Its hazard reporting method is primarily via the GreenScreen Benchmark and GreenScreen List Translator

The HPD service includes both an online “HPD Builder” and an offline form that companies can use to document the contents of their products and health hazards associated with those contents. Manufacturers are allowed to avoid naming specific substances as long as they list the function of those proprietary substances in the product and identify any associated health hazards.

HPDC describes the HPD as “an impartial tool for the **accurate reporting of product contents and each ingredient’s relationship to the bigger picture of human health and ecological health**. The HPD **objectively defines the critical information needed to support accurate supply chain disclosure** by manufacturers and suppliers, and informed decisions by building designers, specifiers, owners, and users.”

A full toxicological screening following GreenScreen protocols is the preferred method of associating hazards with product contents, but that GreenScreen Benchmark process is time-consuming and expensive, and only a small percentage are publicly accessible for no charge. As a fallback, HPD uses a series of “authoritative lists” to check for hazard warnings from the substances in a product; that’s the GreenScreen List Translator method.

Companies creating HPDs for their products also have options regarding how complete their reporting is. They indicate on the form if they’ve documented ingredients to the 99 percent, 99.9 percent (1,000 parts per million), or 99.99 percent (100 parts per million) level. They also report how they’ve addressed “residuals”—substances that are not intentionally added to a product but may be there inadvertently.

An updated HPD 2.0 format, released in September 2015, greatly improves the clarity with which companies document those factors.⁴⁹ HPDs can be either self-declared or third-party-verified. Those that have been verified by a reputable organization are likely to be more comprehensive and accurate.

www.hpd-collaborative.org

⁴⁸ For additional reading, see the National Institute of Building Sciences, “Whole Building Design Guide – Green Building Standards and Certification Systems” including product certifications, www.wbdg.org/resources/gbs.php

⁴⁹ Melton, Paula. “New HPD Promises Better Reporting, More Participation,” www2.buildinggreen.com

Cradle to Cradle Products Innovation Institute (C2CPII)

C2CPII is a private nonprofit that owns and manages the C2C product certification program, which it acquired from McDonough-Braungart Design Chemistry in 2010. A volunteer board and committees determine the certification thresholds and protocols.

C2C certification for products is based on information gathered and reviewed by an independent assessor across five categories: material health, material reutilization, renewable energy and carbon management, water stewardship, and social fairness. The resulting certification can be at one of five levels, from “basic” to “platinum.”

While C2C certification was traditionally based on performance in all five areas, the recent demand for product health and safety information has led the organization to introduce a more narrow certification specifically for the “material health” category. Material Health certification under C2C requires the absence of any substances on the organization’s “Banned List.”⁵⁰ Beyond the Banned List, substances are characterized into Red, Yellow, and Green tiers, according to the importance placed on avoiding them. There is also a Gray tier for substances that have not been adequately characterized.

⁵⁰ www.c2ccertified.org/resources/detail/cradle-to-cradle-certified-banned-list-of-chemicals

A product’s level of certification in C2C’s Material Health category depends on its success in avoiding Red- and Yellow-tagged substances, although at the lower levels the product may contain such ingredients as long as the manufacturer is actively working to find safer alternatives. An assessment of exposure and resultant risk is also factored into the certification-level determination.

According to C2CPII:

“The Cradle to Cradle Certified™ Product Standard provides **a continuous improvement pathway toward the development of quality products.**”

“...the Standard can make improvements in five quality categories relating to human and environmental health.”

“A new offering—the Material Health Certificate—will provide manufacturers with **a trusted way to communicate their efforts to identify and replace chemicals of concern** in their products.”

www.c2ccertified.org/get-certified

GreenScreen® for Safer Chemicals

GreenScreen is a project of the private, nonprofit Clean Product Action (CPA), a group that develops and disseminates resources designed to promote green chemistry. The GreenScreen protocols are developed and managed by organization staff, and is largely based on the Globally Harmonized System (GHS) for Chemicals established by the United Nations.

There are two different protocols that apply to transparency documents: the “GreenScreen for Safer Chemicals” chemical hazard assessment, and the GreenScreen “List Translator.” The former describes a structured method for researching a substance and assigning it a hazard level based on assessing 18 human health and environmental fate and toxicity endpoints, resulting in a benchmark score on a four-point scale ranging from one to four, with a benchmark one score corresponding to “Avoid—Chemical of High Concern” and a benchmark four score corresponding to “Prefer—Safer Chemical.” The full GreenScreen process requires specialized training and a background in toxicology, and can be performed by either CPA-authorized profilers or members of the public, as GreenScreen is an open source methodology. To date, more than 1,000 chemicals have been GreenScreened by CPA-licensed profilers.

The GreenScreen List Translator protocol is much quicker and largely automated via tools such as the Pharos Project. It entails checking for references to a substance on a number of “authoritative lists,” and reporting out the associated hazard level based on whether and how the substance appears on those lists.

According to CPA, the GreenScreen® for Safer Chemicals is “a publicly available and transparent chemical hazard screening method **to help move our society quickly and effectively toward the use of greener and safer chemicals.**

GreenScreen allows users to evaluate chemicals based on their inherent hazards—for example, to determine if they are linked to cancer, are toxic to fish, or are persistent in the environment—and **to promote continuous improvement** toward safer chemicals.”

“By using GreenScreen, companies can rank chemicals and understand why some alternatives are more or less preferable. This helps them **make more informed decisions, reduce their business risk and promote innovation.**”

www.greenscreenchemicals.org

Declare

Declare is a self-disclosure tool and label from the International Living Future Institute, the private nonprofit that administers the Living Building Challenge certification program and houses the Cascadia Chapter of the U.S. Green Building Council and Canada Green Building Council. The program is developed and managed by ILFI staff.

Declare labels list the contents of a product and indicate if any of those contents are on the LBC Red List. If they are on the Red List, the label further indicates if they've been deemed "LBC-compliant" due to temporary exception.

Declare is also the transparency reporting tool referenced by ILFI's new Living Product Challenge program, which seeks to encourage the release of products that have a net-positive impact on human health and the environment.

According to ILFI:

"Declare your product and **stake your claim in the transparent materials economy.**"

"It's a **'nutrition label' for the building industry**, and it lets you **connect with your market on a whole new level.**"

"Use the Declare product database and label to **find building products that have declared their ingredients, source, and manufacturing locations.**

Living Building Challenge project teams can also use the Declare label for materials documentation, streamlining the process of project certification. Manufacturers of the products included in the Declare database have voluntarily disclosed their ingredients list and a company head has personally ensured this information is true. Declare does not conduct product testing nor do we endorse the information provided."

www.declareproducts.com

Greenguard

Greenguard is a program of the nonprofit testing organization Underwriters Laboratories. Greenguard develops and manages its own standards, using industry-standard testing protocols. Greenguard was a pioneer in the use of stainless-steel testing chambers to quantify and characterize the volatile organic compounds (VOCs) that offgas from building materials.

“GREENGUARD Certification helps manufacturers create—and helps buyers identify—interior products and materials that have **low chemical emissions, improving the quality of the air** in which the products are used.”

“You see... [office furnishings]; We see... **a more productive workplace.**” (home page splash screen)

“GREENGUARD Certification provides the market with solutions and resources **to identify products with lower chemical emissions**, and provides manufacturers with credible tools to legitimize and promote their sustainability efforts.”

“GREENGUARD Certification **ensures that a product has met some of the world’s most rigorous and comprehensive standards** for low emissions of volatile organic compounds (VOCs) into indoor air.”

www.greenguard.org/en/newGG/new_certificationPrograms.aspx

The Carpet and Rug Institute Green Label Plus

The Carpet and Rug Institute (CRI) is the trade association for the carpet industry. It develops and manages its own standards.

Using methods that subsequently extended to a broad range of building products, the carpet industry’s Green Label program tests carpets, carpet pads, and carpet adhesives for VOCs that could affect occupant health.

“Green Label and Green Label Plus **ensure that customers are purchasing the lowest emitting carpet, adhesive, and cushion products** on the market.”

www.carpet-rug.org/CRI-Testing-Programs/Green-Label-Plus.aspx

Appendix 03:

Background/origins of this work

Several AIA members who were early proponents of materials transparency identified a need for the AIA to clarify the approach to asking for and/or receiving information about potentially hazardous substances in the building products they specify in order to avoid increasing their professional liability and/or exposure to legal action. In response to that need, and the AIA Board Position Statement on Materials and Transparency, the AIA's Materials Knowledge Working Group, convened a Task Force led by Mike Davis, FAIA; Russell Perry, FAIA; Mary Ann Lazarus, FAIA; and Paula McEvoy, AIA; to explore the matter.

The Task Force organized a workshop of architects, architecture firm general counsel, professional liability insurance providers, AIA staff, and allied professionals to explore the concern and identify opportunities for AIA to help its members understand and manage risks or potential risks arising from actions related to the new Position Statement. The Task Force's expectation leading into the workshop was that modifications to standard AIA Contract Documents, along with member education, would go a long way towards mitigating any real or perceived risk.

In preparation for the workshop, the Task Force assembled a list of questions in the form of hypothetical actions that an architect or firm might take. Workshop participants were asked to designate which of those actions could be considered "safe," "manageable" (e.g., safe under certain conditions or with appropriate caveats), and "inadvisable" from a legal risk perspective. The questions were grouped into three categories:

1. Professional Practice: Questions regarding what happens if or when materials knowledge and disclosure affects our professional services, including those associated with preparation of contract documents.
2. Communications with the Client: Questions regarding what happens if or when materials knowledge and disclosure affects the professional communication we normally have with our clients.
3. Communications with the Public: Questions about whether there is a relationship between materials knowledge and disclosure and architects' obligations to third parties, if any.

Guided by facilitator Nadav Malin of BuildingGreen, workshop participants spent the morning understanding the task and potential risks, and the afternoon recommending solutions and mitigation measures for the real or perceived risks that came to the fore. The outcomes from that workshop informed member education initiatives, including this White Paper, and other efforts related to AIA's Sustainability Scan including, specifically, the Materials Knowledge Working Group.

The Workshop also informed the AIA Contract Document Committee's work in revising the AIA Guide for Amendments to AIA Owner-Architect Agreements: Document B503™ – 2007 to provide model contract language.

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