

BUILDINGENERGY BOSTON

Scaling Up Material Health

Christine M. Vöhringer (Perkins Eastman Architects)

Madaline Hale (HMFH Architects)

Christine Vandover (HOK)

Mandy Miller (Elkus Manfredi Architects)

Curated by Greg Smith and Frank Nitti

Northeast Sustainable Energy Association (NESEA)

March 29, 2023

MEET THE PRESENTERS



Christine Vohringer

Firmwide Sustainability
Specialist, Boston
Perkins Eastman Architects



Mandy Miller

Materials Specialist/
Resource Librarian
Elkus Manfredi Architects
Boston



Christine Vandover

Design Principal
HOK New York



Madaline Hale

Interior Designer
Manager
HMFH Boston

The Material Health Challenge



Material Health is:

The selection of products + materials **to prioritize the protection of human health and the environment**, generating a **positive impact** on the quality of materials available for future use and cycling .

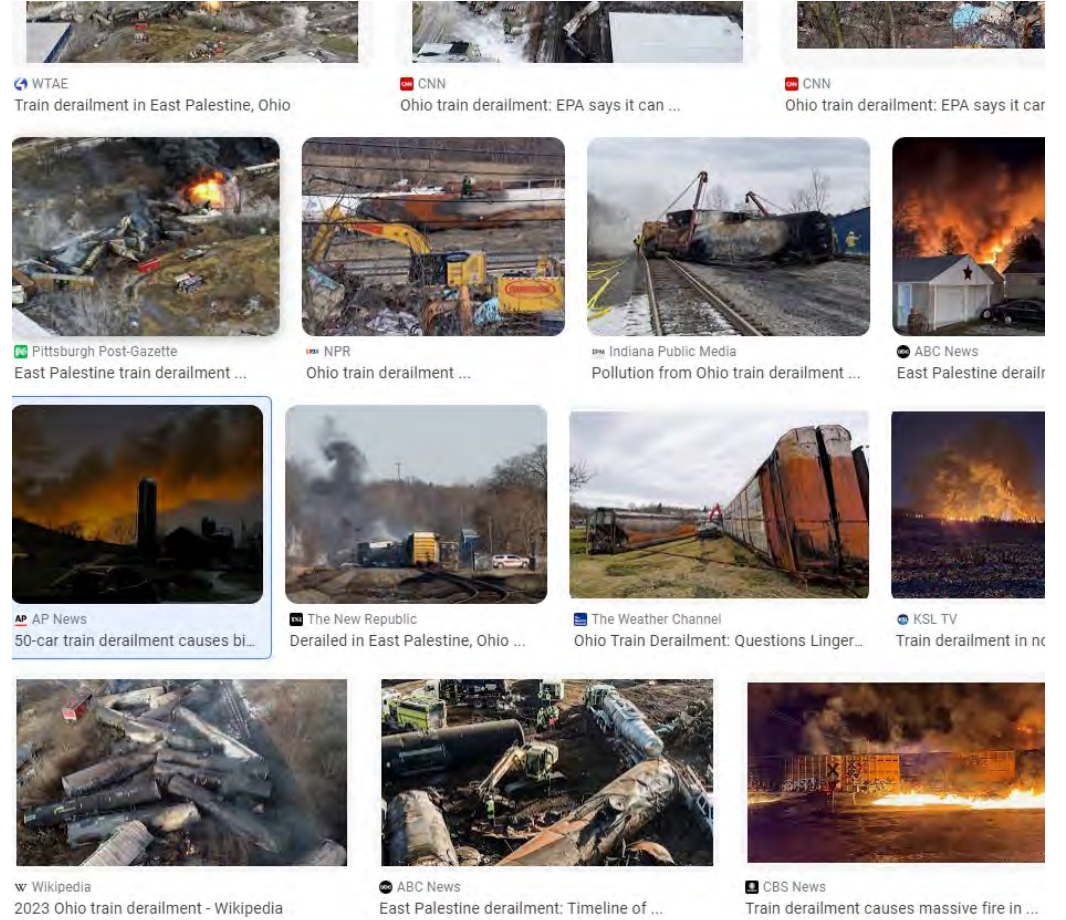
Cradle to Cradle on the Materials Health definition.

BEAUTY + DURABILITY + SUSTAINABILITY

Why?



Train derailment in East Palestine, Ohio, on Feb. 3. Photo by U.S. Environmental Protection Agency / Handout/Anadolu Agency via Getty Image



WHY?

**HUMAN
HEALTH**



**CLIMATE
CHANGE**



**SOCIAL
EQUITY**





We
EVOLVE
our
PROFESSION

Material Health & the Industry



2020 Code of Ethics and Professional Conduct

The commentary is not part of the Code. Enforcement will be determined by application of the Rules of Conduct alone; the commentary will assist those seeking to conform their conduct to the Code and those charged with its enforcement.

Section	Section
Section 1001	Section 1002
Section 1003	Section 1004
Section 1005	Section 1006
Section 1007	Section 1008
Section 1009	Section 1010
Section 1011	Section 1012
Section 1013	Section 1014
Section 1015	Section 1016
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Section 1039	Section 1040
Section 1041	Section 1042
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Section 1047	Section 1048
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Section 1051	Section 1052
Section 1053	Section 1054
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Section 1057	Section 1058
Section 1059	Section 1060
Section 1061	Section 1062
Section 1063	Section 1064
Section 1065	Section 1066
Section 1067	Section 1068
Section 1069	Section 1070
Section 1071	Section 1072
Section 1073	Section 1074
Section 1075	Section 1076
Section 1077	Section 1078
Section 1079	Section 1080
Section 1081	Section 1082
Section 1083	Section 1084
Section 1085	Section 1086
Section 1087	Section 1088
Section 1089	Section 1090
Section 1091	Section 1092
Section 1093	Section 1094
Section 1095	Section 1096
Section 1097	Section 1098
Section 1099	Section 1100
Section 1101	Section 1102
Section 1103	Section 1104
Section 1105	Section 1106
Section 1107	Section 1108
Section 1109	Section 1110
Section 1111	Section 1112
Section 1113	Section 1114
Section 1115	Section 1116
Section 1117	Section 1118
Section 1119	Section 1120
Section 1121	Section 1122
Section 1123	Section 1124
Section 1125	Section 1126
Section 1127	Section 1128
Section 1129	Section 1130
Section 1131	Section 1132
Section 1133	Section 1134
Section 1135	Section 1136
Section 1137	Section 1138
Section 1139	Section 1140
Section 1141	Section 1142
Section 1143	Section 1144
Section 1145	Section 1146
Section 1147	Section 1148
Section 1149	Section 1150
Section 1151	Section 1152
Section 1153	Section 1154
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Section 1157	Section 1158
Section 1159	Section 1160
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Section 1171	Section 1172
Section 1173	Section 1174
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Section 1179	Section 1180
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Section 1183	Section 1184
Section 1185	Section 1186
Section 1187	Section 1188
Section 1189	Section 1190
Section 1191	Section 1192
Section 1193	Section 1194
Section 1195	Section 1196
Section 1197	Section 1198
Section 1199	Section 1200



AIA Climate Action URGENT & SUSTAINED

The AIA RESOLUTION:

NOW, THEREFORE, BE IT RESOLVED, that commencing in 2019 and continuing until zero-net-carbon practice is the accepted standard of its members, the AIA prioritized and support urgent climate action as a health, safety, and welfare issue, to exponentially accelerate the "decarbonization" of buildings, the building sector, and the built environment.

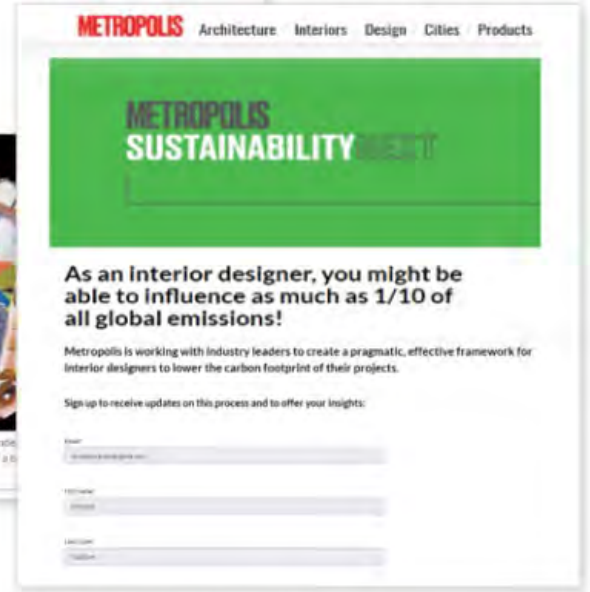
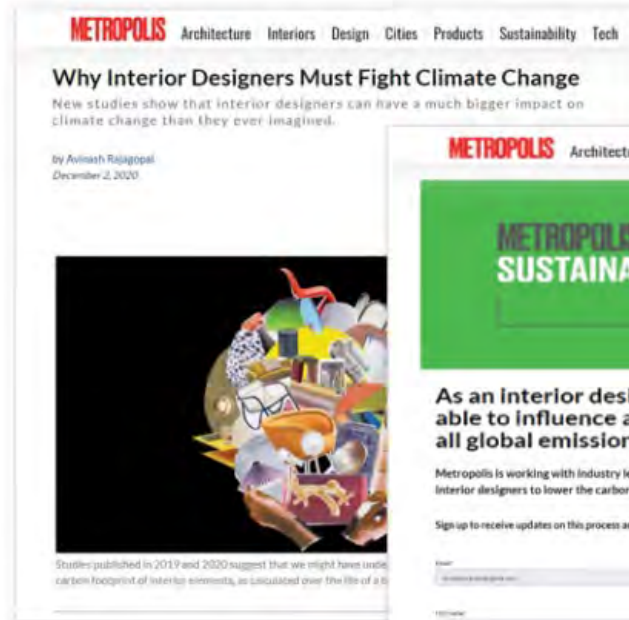
BE IT FURTHER RESOLVED, that the AIA engage its full membership; the clients and communities members serve; federal, state and local policy makers and governing bodies; other professional organizations and affiliates, and the public on climate action through a multi-year strategy for education, practice, advocacy, and outreach.


"...exponentially accelerate the "decarbonization" of buildings, the building sector, and the built environment"

BE IT FURTHER RESOLVED, that following the example of the AIA Guides for Equitable Practice, the AIA prepare Guidelines for Ethical practice on Climate Action to delineate practices for complying with Canon VI, Obligations to the Environment in the AIA Code of Ethics and Professional Conduct.

BE IT FURTHER RESOLVED, that the AIA revise its Public Policies and Position Statements to support urgent climate action.

BE IT FURTHER RESOLVED, that the AIA adopt and implement the recommendations of the Blue-Ribbon Panel on Codes and Standards and the Sustainability Leadership Group.





*"When materials such as asbestos were put into use, when lead was added to paint, and we discovered the properties of PVC, we didn't know any better. **Now we do, and it is time to start acting like it.**"*

Jon Smieja, VP, Circularity & Senior Analyst. GreenBiz Group

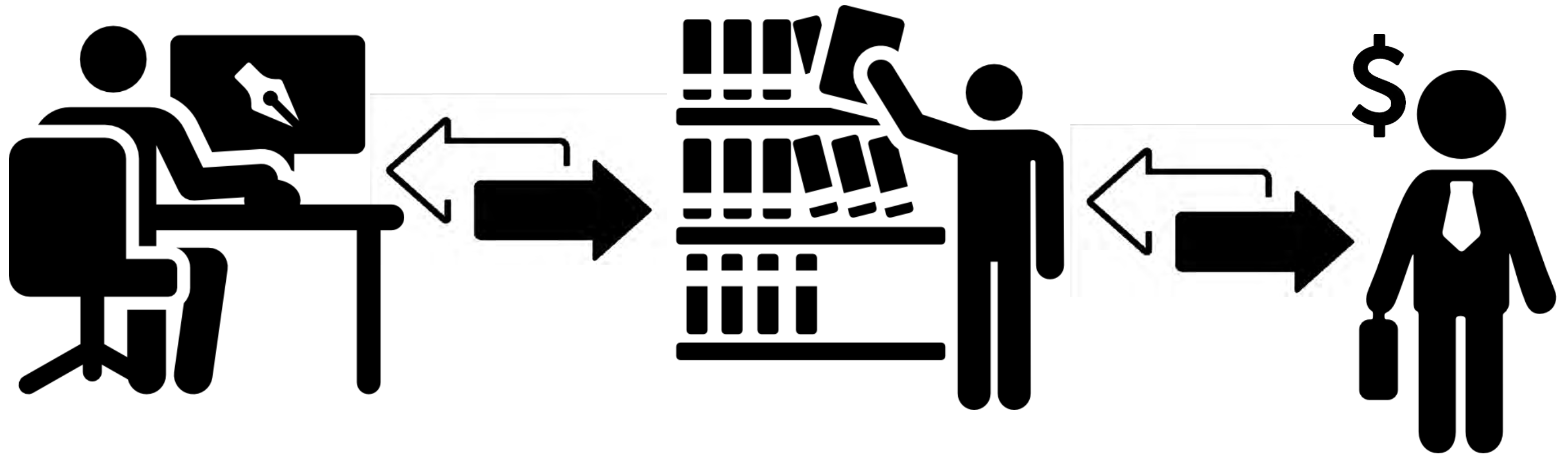
ELKUS MANFREDI

Evolution of the Materials Library



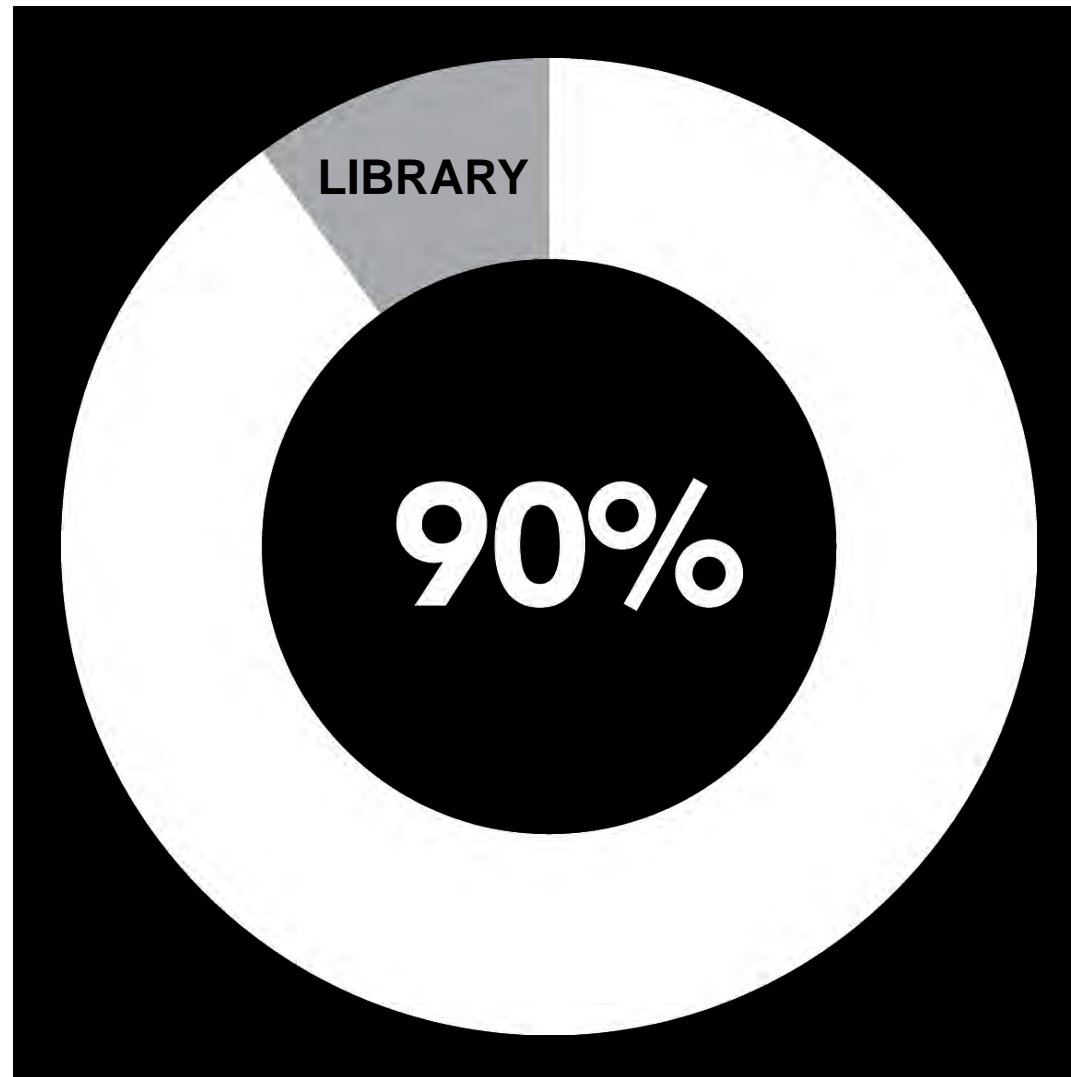
A&D Materials Library

Resource Liaison



A&D Materials Library

Resource Liaison- Dual Roles



More

THAN MY

Title

A&D Materials Library

Resource Liaison - Dual Roles



Ex. Global A&D Firm
28 Studios

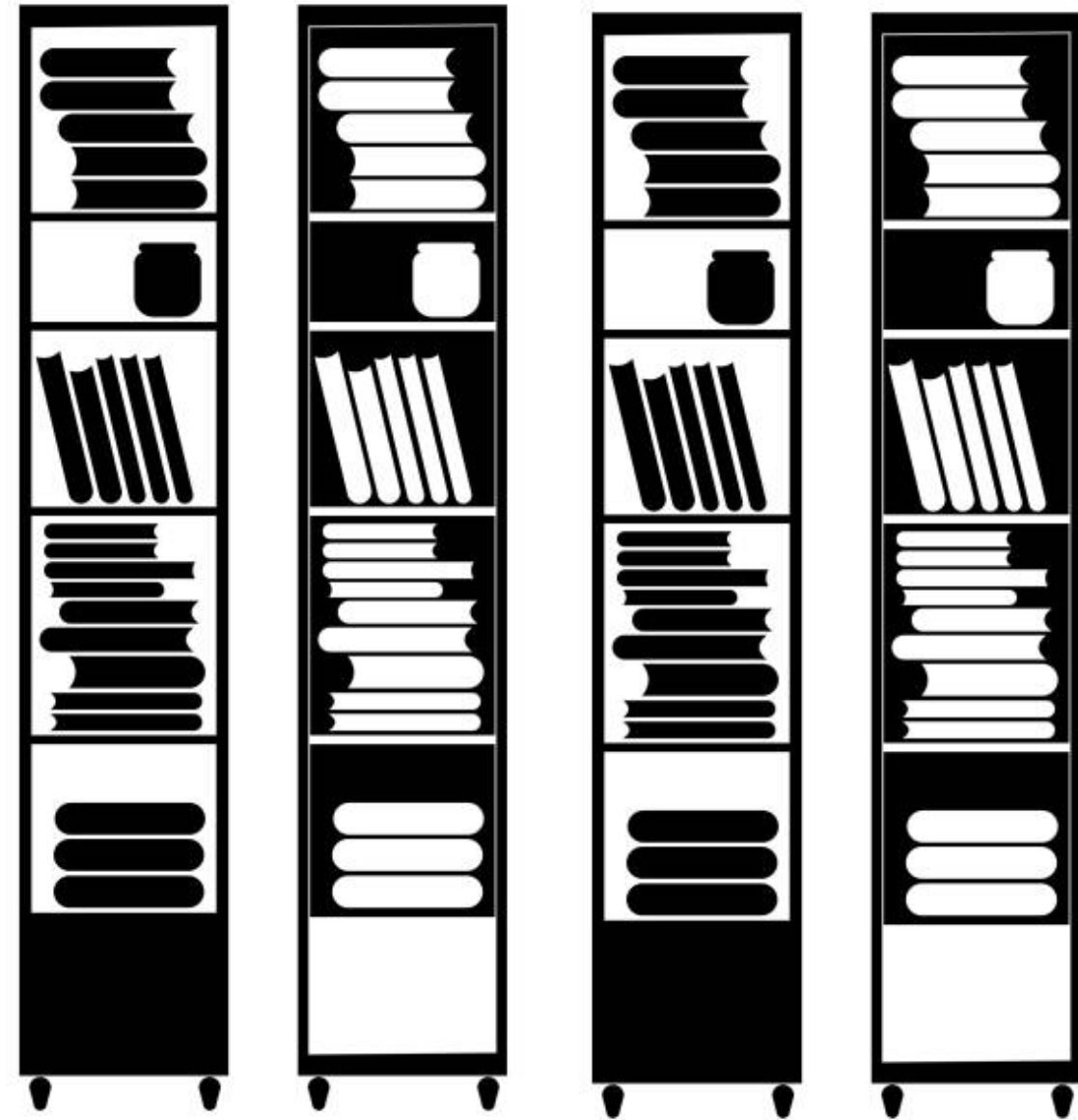
2 Studios Dedicated Librarians

8 Studios Library Consultants

18 Studios Dual Roles

A&D Materials Library

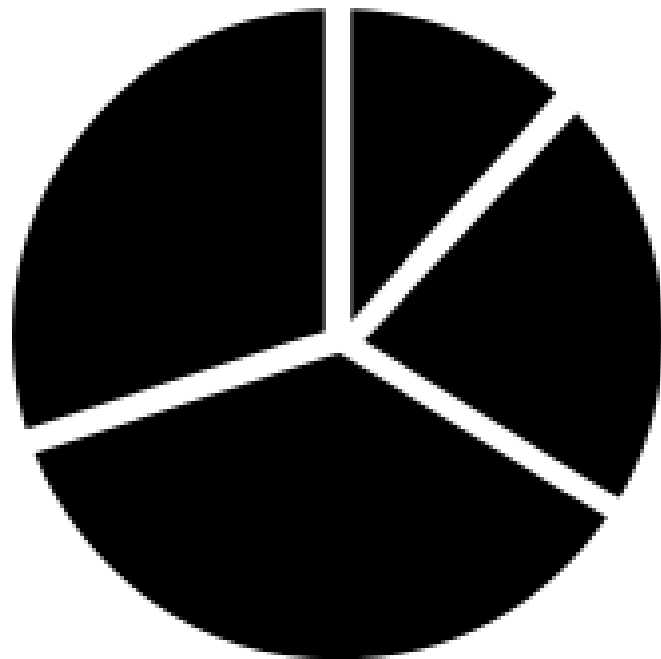
Resource Liaison – Library Consultants



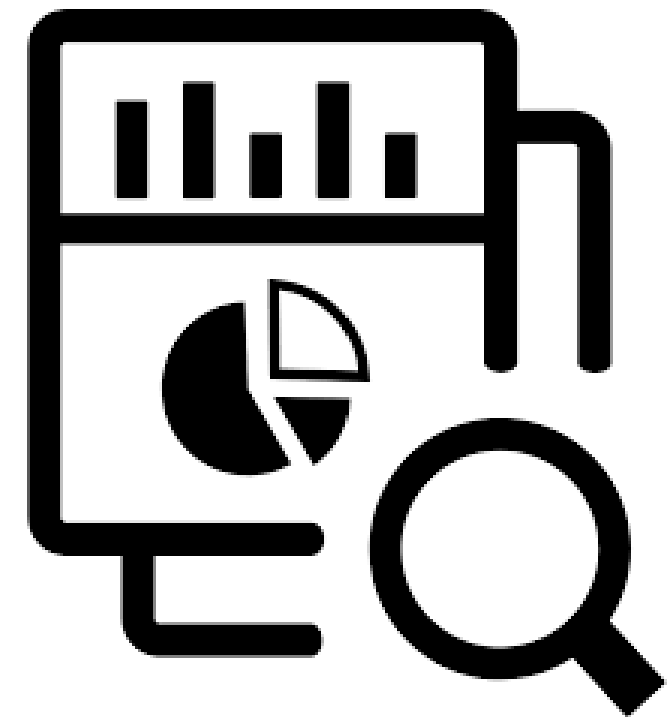
A&D Materials Library

The Evolution – Material Health

Traditional
Gatekeeping

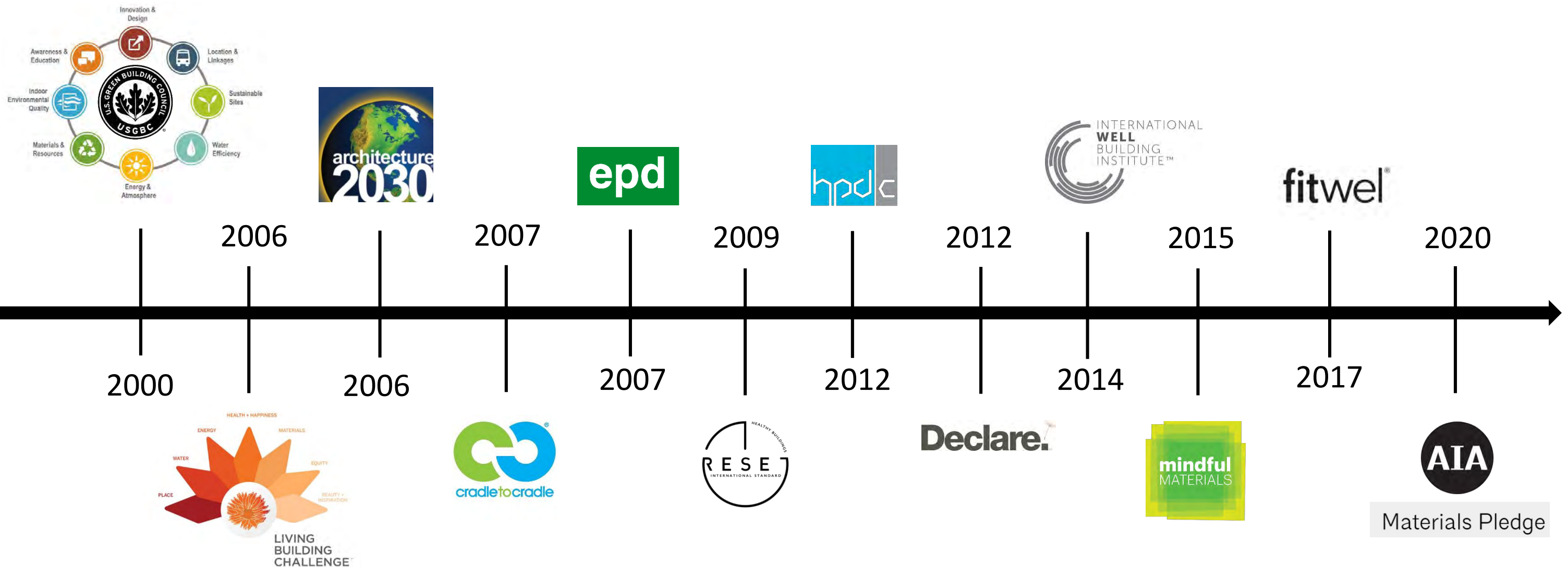


Eco Gatekeeper
Transparency



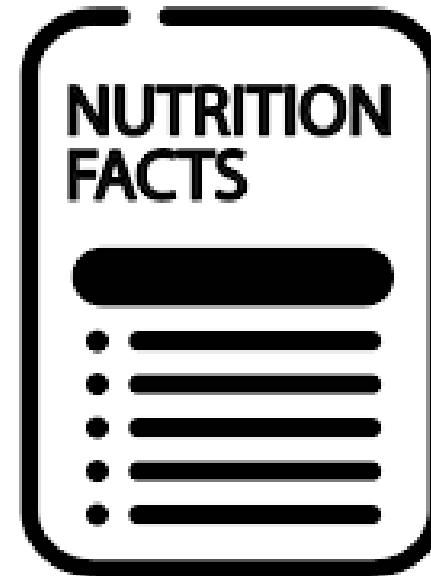
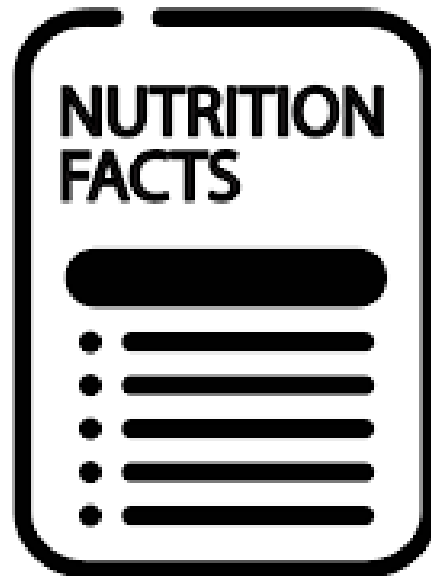
A&D Materials Library

The Evolution – Green Rating Systems, Certifications, Eco Labels, and Pledges



A&D Materials Library

Scaling Up - Transparency





PURLINE ORGANIC FLOORING by Windmoeller

Health Product
Declaration v2.3

created via: HPDC Online Builder

HPD UNIQUE IDENTIFIER: 51234
CLASSIFICATION: 09 65 00 Resilient Flooring
PRODUCT DESCRIPTION: PURLINE by Windmoeller, is the first elastic organic flooring worldwide from Bio-polyurethane, made from natural and renewable materials. The PURLINE organic flooring made in various designs in sheet, tile and plank formats is easy to maintain, requiring no applied finish or harsh chemicals. PURLINE satisfies the highest environmental needs for healthy living spaces. PURLINE is odorless, free of chloride, plasticizers, solvents and has international certifications GreenGuard Gold, Cradle to Cradle c2c Silver, Floor Score, Declare, EPD

Section 1: Summary Basic Method / Product Threshold

CONTENT INVENTORY			
Inventory Reporting	Threshold Level	Residuals/Impurities Evaluation	<i>For all contents above the threshold, the manufacturer has:</i>
Format	<input checked="" type="radio"/> 100 ppm	<input type="radio"/> Completed	Characterized <input checked="" type="radio"/> Yes <input type="radio"/> No
<input type="radio"/> Nested Materials Method	<input type="radio"/> 1,000 ppm	<input type="radio"/> Partially Completed	<i>Provided weight and role.</i>
<input checked="" type="radio"/> Basic Method	<input type="radio"/> Per GHS SDS	<input type="radio"/> Not Completed	Screened <input checked="" type="radio"/> Yes <input type="radio"/> No
Threshold Disclosed Per	<input type="radio"/> Other	Explanation(s) provided :	<i>Provided screening results using HPDC-approved methods.</i>
<input type="radio"/> Material	<input checked="" type="radio"/> Yes <input type="radio"/> No	Identified	<input type="radio"/> Yes <input checked="" type="radio"/> No
<input checked="" type="radio"/> Product		<i>Provided name and CAS RN or other identifier.</i>	

CONTENT IN DESCENDING ORDER OF QUANTITY

Summary of product contents and results from screening individual chemical substances against HPD Priority Hazard Lists and the GreenScreen for Safer Chemicals®. The HPD does not assess whether using or handling this product will expose individuals to its chemical substances or any health risk. Refer to Section 2 for further details.

[PRODUCT | MATERIAL OR SUBSTANCE | RESIDUAL OR IMPURITY | GREENSCREEN SCORE | HAZARD TYPE](#)

PURLINE ORGANIC FLOORING | LIMESTONE BM-3dg
POLYURETHANE FOAMS LT-UNK ALUMINUM HYDROXIDE, DRIED BM-2 ZEOLITES LT-UNK CONTINUOUS FILAMENT GLASS FIBER, NON-RESPIRABLE LT-UNK POLYETHYLENE TEREPHTHALATE (PET) LT-UNK POLYPROPYLENE LT-UNK CELLULOSE,
MICROCRYSTALLINE LT-UNK RES KAOLIN LT-UNK CAN UNDISCLOSED LT-UNK RES WHITE MINERAL OIL LT-UNK TITANIUM DIOXIDE LT-1 | CAN | END |

Number of Greenscreen BM-4/BM3 contents ... 1
 Contents highest-concern GreenScreen score(s) (BM-1, LT-1, LT-P1) ... LT-1
 Nanomaterial ... No
INVENTORY AND SCREENING NOTES:
 All ingredients have been screened against HPD authoritative lists, but not all CAS#'s have been disclosed to protect proprietary formulations.

VOLATILE ORGANIC COMPOUND (VOC) CONTENT
 VOC Content data is not applicable for this product category.

CERTIFICATIONS AND COMPLIANCE *See Section 3 for additional listings.*
 VOC emissions: GreenGuard - Gold (previously Children & Schools)
 VOC emissions: Danish Indoor Climate Labelling - Wall & ceiling systems Criteria
 VOC emissions: RFCl FloorScore
 Multi-attribute: C2CPH Material Health Certificate - Silver (V3.1)

CONSISTENCY WITH OTHER PROGRAMS
 No pre-checks completed or disclosed.

Third Party Verified? Yes No

PREPARER: Self-Prepared
 VERIFIER:
 VERIFICATION #:

SCREENING DATE: 2022-01-04
 PUBLISHED DATE: 2023-01-30
 EXPIRY DATE: 2025-01-04



Polyurethane Floor Covering Windmüller GmbH

Final Assembly: Detmold, North Rhine-Westphalia, Germany;
Augustsdorf, North Rhine-Westphalia, Germany
Life Expectancy: 30 Year(s)
End of Life Options: Landfill (100%)

Ingredients:

Filler: Calcium carbonate; Zeolite; **Polymer:** Polyurethane;
Nonwovens: Glass; Polyester; Polypropylene; **Flame Retardant:**
Aluminium Hydroxide; **Decor Paper:** Cellulose; **Decor Paper Filler:** Kaolin; **Decor Paper Pigment:** Titanium dioxide;
Additives and Decor Paper Dyes: Undisclosed (0.5-1%); **Foam Regulator:** White Oil

[†]LBC Temp Exception RL-004b - Proprietary Ingredients in Declare

Living Building Challenge Criteria: Compliant

I-13 Red List:

- LBC Red List Free % Disclosed: 99% at 100ppm
- LBC Red List Approved VOC Content: Not Applicable
- Declared

I-10 Interior Performance: AgBB Scheme 2009

I-14 Responsible Sourcing: Not Applicable

WDM-0001
EXP. 01 NOV 2023
Original Issue Date: 2018



ENVIRONMENTAL PRODUCT DECLARATION



Interface®

Interface, Inc Americas
Modular Carpet on GlasBao®
Nylon

According to ISO 14025,
EN 15804 and ISO 21930:2017

4. Life Cycle Assessment Results

Table 6. Description of the system boundary modules (X = system included in boundary; MND = module not declared)

EPD Type	PRODUCT STAGE					CONSTRUCTION PROCESS STAGE							USE STAGE				END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D				
		X																			
				X	X	MND	X	MND	X	MND	MND	MND	MND	MND	X	MND	X			MND	

4.1. Life Cycle Impact Assessment Results

Table 7. North American Impact Assessment Results

TRACI v2.1	A1-A3	A4	A5	B2	B4	C2	C4
GWP [kg CO2 eq]	4.78E+00	2.37E-01	2.78E-02	4.12E-01	2.11E+01	4.94E-03	2.16E-01
ODP [kg CFC-11 eq]	5.01E-06	6.32E-17	8.67E-10	2.12E-09	2.00E-05	1.32E-18	7.44E-16
AP [kg SO2 eq]	2.91E-02	1.27E-03	1.02E-04	8.24E-04	1.24E-01	2.65E-05	5.91E-04
EP [kg N eq]	4.28E-03	9.51E-05	1.80E-05	2.69E-04	1.87E-02	1.99E-06	2.81E-04
SFP [kg O3 eq]	4.02E-01	2.85E-02	1.23E-03	1.36E-02	1.77E+00	5.95E-04	9.97E-03
ADP _{fossil} [MJ, LHV]	1.02E+01	4.57E-01	5.96E-02	3.69E-01	4.46E+01	9.55E-03	4.33E-01

Key: GWP 100 = global warming potential; ODP = ozone depletion potential; AP = acidification potential; EP = eutrophication potential; SFP = smog formation potential; ADP fossil = abiotic resource depletion potential of non-renewable (fossil) energy resources



A&D Materials Library

Scaling Up – Transparency Protocol

Prepare

Products must be listed in either website. These are free and open to all manufacturers and building product materials with transparency documents.

[mindfulMATERIALS](#)

[Sustainable Minds Catalog](#)

Meet

After the required transparency documentation has been submitted, schedule a transparency review appointment.*

MaterialsLibrarian@Elkus-Manfredi.com

Present

Priority for presentation scheduling will be given to vendors who have brought their products in and have at least one of the required form of transparency.

EMA advocate manufacturers for materials that positively impact human health, the climate, the environment, and society.

Manufacturers must have one form of transparency documentation on their website. Acceptable transparency forms, in order of preference:



Health Product Declaration ([HPD](#)) a technical specification for reporting information on product contents and associated health information. 100/1000ppm disclosed.



Declare.

[Declare](#) is a multi-attribute transparency standard label. Answers three questions: Where does the product come from? What is it made of? Where does it go at the end of its life? 99% contents disclosed.



Environmental Product Declaration ([EPD](#)) a life-cycle report. Provides information about a product's impact upon the environment, such as global warming potential, embodied carbon, and water pollution.



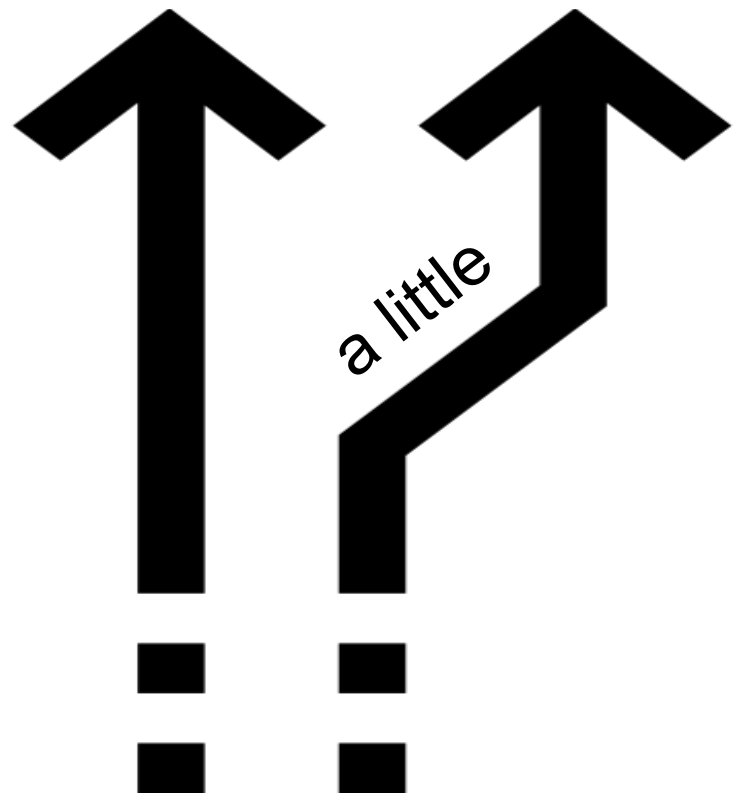
Cradle to Cradle ([C2C](#)) a multi-attribute standard used globally across industries. C2C certificate provides the framework to assess the safety, circularity, and responsibility of materials and products across five categories of sustainability performance.

Scale Up by Subtracting!

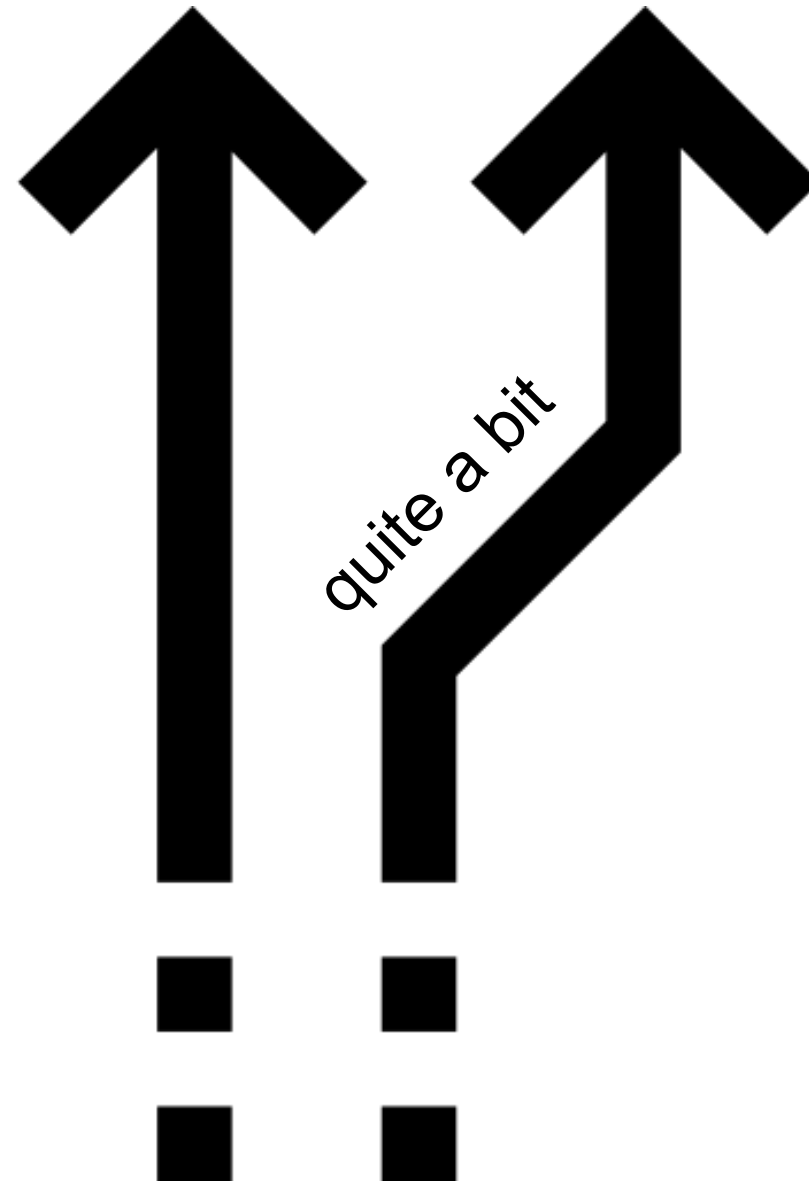


Scaling Up the Materials Library

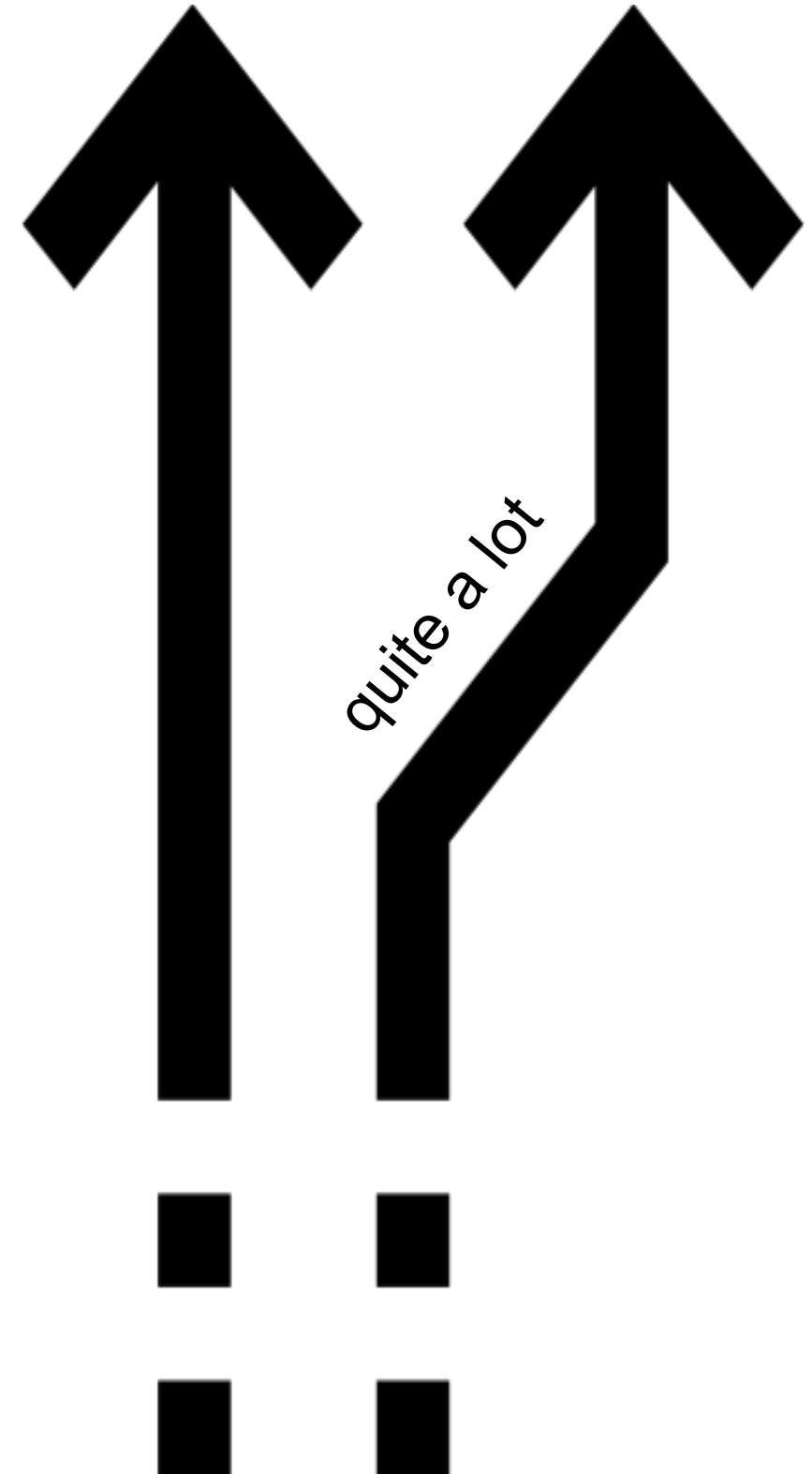
not at all



a little



quite a bit



quite a lot

HOK

Clarity of a Framework + Embedding Tracking into the Process



ACCELERATING SUSTAINABLE INTERIOR DESIGN IN 2020

THE ASK

Be personally accountable in your everyday work to address human health, climate change + social equity

250-350+

MATERIALS ON EVERY
INTERIORS PROJECT

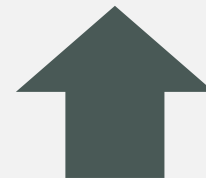
SUSTAINABLE ACTION

01/
VISIONING

02/
PRODUCT
SELECTION

03/
TRACKING

04/
PROFESSIONAL
ETHICS



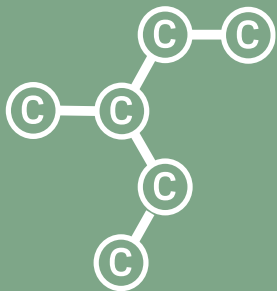
HOK's future viability will track
with our action on sustainability

We will either have an advantage OR a disadvantage

PRODUCT SELECTION FRAMEWORK

EMBODIED CARBON

The measurement of embodied energy and carbon for a material, with consideration for the total amount of **greenhouse gases released** from raw material extraction to the end of its useful life



GREEN CHEMISTRY

Design of products and processes that **reduce or eliminate** hazardous substances and VOCs



SUSTAINABLE SOURCING

Products made from raw materials that are either **recycled or limit environmental damage** caused by their production



CIRCULARITY



SPECIFICATIONS FINISH TEMPLATE

SUSTAINABILITY INFORMATION COLUMNS

A CLOSER LOOK

1

EMBODED CARBON		
EMBODED CARBON See EPD for A1-A3		
INTERNAL CHALLENGE: 65% have EPD's		
50%	Project Performance (=Y)	
Is the Product in EC3 or does the Product have an EPD? [Y/N]		
	GWP #	Units

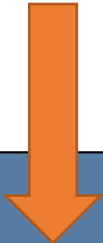
2

GREEN CHEMISTRY	
MATERIALS CERTIFICATIONS Declare, Cradle to Cradle, GreenScreen, etc.	LOW EMITTING CERTIFICATIONS Cradle to Cradle, Living
INTERNAL CHALLENGE: 50% have third party certifications	INTERNAL CHALLENGE: 90% Compliant VOCs
50.0%	100%
Select the certification that applies to this product	Select the certification that applies to this product2

SPECIFICATIONS FINISH TEMPLATE

S U S T A I N A B I L I T Y I N F O R M A T I O N C O L U M N S

New column added



3

SUSTAINABLE SOURCING				
% PRE/POST CONSUMER RECYCLED CONTENT		WOOD PRODUCTS FSC		BIO-BASED / REUSE Bio-Based, Material Reuse, etc.
INTERNAL CHALLENGE: 65% have recycled content		INTERNAL CHALLENGE: 100% FSC		INTERNAL CHALLENGE: 10%
50%	Project Performance (=Y)		100.0%	100.0%
Does the product have recycled content?	What % pre-consumer?	What % post-consumer?	FSC TYPE	Select Product Contribution

MEET THE *LIAISONS*



Kelly Jordan
Sr. Project Int Designer
Toronto



Merissa Reed
Interior Designer
Ottawa

ADVISORS
Elizabeth Baxter, Houston
Christine Vandover, New York



Channah Morris
Sr Interior Design Pro
Atlanta



Taylor Welsh
Sr. Interior Designer
Calgary



Olivia Danielson-Veed
Sr Project Int Designer
Chicago



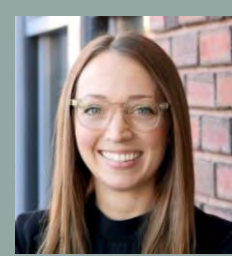
Sarah Proefrock
Interior Designer
Dallas



Jasalyn Douet
Technical Coordinator
Houston



Kara Raasch
Sr. Project Int.
Designer
Kansas City



Lauren North
Interior Designer
Kansas City



Ashpreet Khurll
Interior Design Asst
London



Susana Cerda
Interior Design Pro
Los Angeles



Selin Gok
Interior Design
Prof
New York



Maggie Corgnati
Sr. Interior Design Pro
Philadelphia



Heather Dennis
Sr Interior Designer
San Francisco



Gayle Bart
Interior Design Pro
Seattle



Jacqueline Dent
Interior Designer
St. Louis



Elizabeth Allen
Interior Design Pro
Tampa



Sara Garisto
Designer
Toronto



Jamie Barr
Interior Design Prof
Washington DC

*SHARING
KNOWLEDGE*
MANUFACTURER
MEETINGS

- + (30+) Virtual Meeting with Manufacturers including: VP of Sales, VP of Sustainability , VP of Marketing and the local rep
- + Opened dialogue / learned from each other + Built new relationships + HOK Leadership
- + HOK's sustainability presentation was shared at several global sales meetings
- + Companies included:

Miller Knoll	Saint Gobain / Decoustics	Teknion / Luum
Steelcase	Benjamin Moore	Carnegie
Stylex	Shaw / Patcraft	Wilsonart
Corian	Dal Tile / Mohawk	Mapei
Tarkett	Crossville/ Nemo	Interface
Lutron	Martin Brattrud	Milliken
Forbo		

67
TOTAL
SUBMISSIONS

149

TOTAL INTERIOR
PROJECTS 2022
@MIDYEAR

45% OF OUR ID
PROJECTS
SUBMITTED

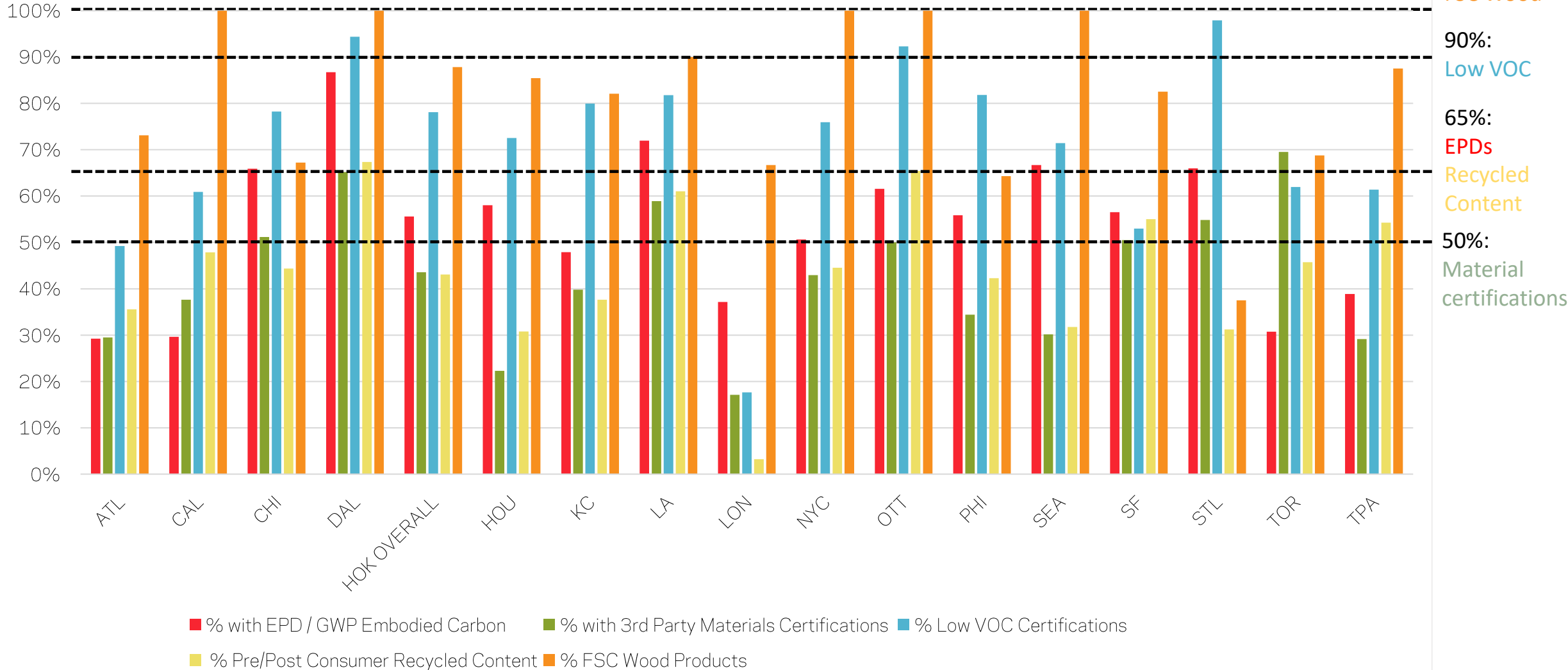
(34) PROJECTS OUT OF 327 SUBMITTED IN 2021 / 14%

<u>2021</u>	<u>2022 Submissions by Office</u>
1	3 Atlanta
-	2 Calgary
4	4 Chicago / Columbus
2	5 Dallas
-	5 Houston
8	13 Kansas City
3	2 Los Angeles
1	1 London
4	9 New York
-	1 Ottawa
2	7 Philadelphia
3	2 San Francisco
1	1 Seattle
1	8 St. Louis
2	2 Tampa
1	2 Toronto
1	- Washington DC
34	67

*HOW DID
WE DO?*

	2021 Target	2021 Result	2022 Target	2022 Result
EPDs (embodied carbon)	50%	53%	65%	55%
Materials Certifications	-	42%	50%	43%
Low Emitting Certifications	100%	74%	90%	78%
Recycled Content	50%	55%	65%	43%
FSC Certified Wood	100%	96%	100%	84%

Sustainability Metrics Overview by HOK Office



PERKINS EASTMAN

A Culture of Material Health



Commitment & Resolution

As a company

OUR GOALS

Speaking to our **HUMAN BY DESIGN** ethos, each of our following goals centers around people. And because we believe sustainability encompasses everything—our goals reflect our company’s social, economic, and environmental priorities.



CARBON

We strive to be a carbon-neutral firm—in both our operations as well as in our work with our clients.



RESEARCH

We strive to be curious—to use applied research to enhance and advance our work.



HOLISTIC WELLNESS

We strive to think about wellness holistically—in terms of people and the planet, and at all scales of work.



MATERIALS

We strive for all of the materials we use to have a net positive benefit on human health, climate health, ecosystem health, social health and equity, and to contribute to a circular economy.



DIVERSITY, EQUITY & INCLUSION

We strive to correct the inequities in our practice, our projects, and our communities, and to celebrate diversity and culture, which we believe enriches our design and our lives.



RESILIENCE

We strive to lead with passive design, as this design strategy provides the key to both reducing future climate emissions and improving livability and resiliency as the impacts of climate change take hold.



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PG. 49
Celebrating Sustainability

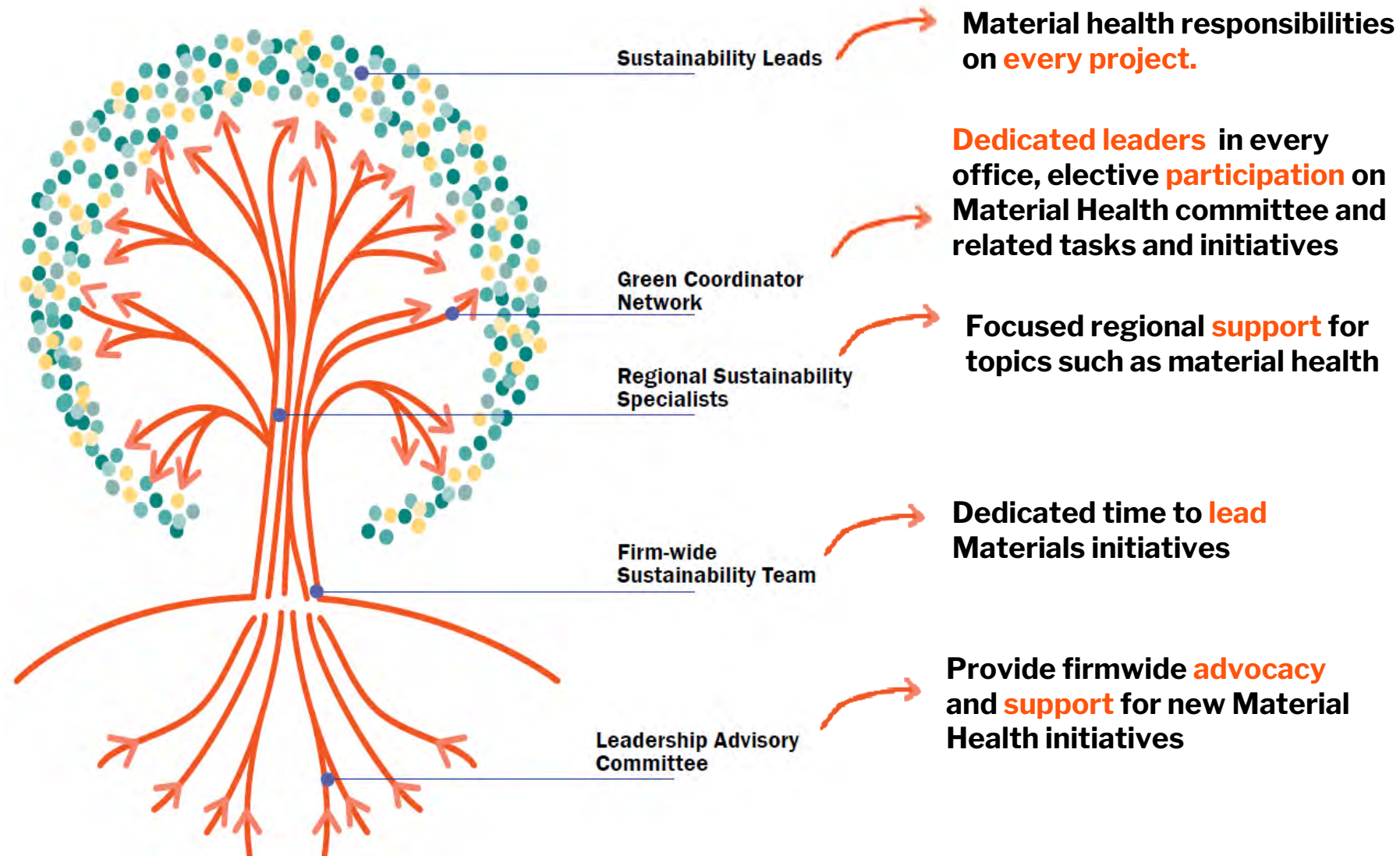
PG. 51
Thought Leadership and Advocacy

PG. 53
References

- Austin
- Boston
- Charlotte
- Chicago
- Costa Mesa
- Dallas
- Dubai
- Guayaquil
- Los Angeles
- Mumbai
- New York
- Oakland
- Philadelphia
- Pittsburgh
- Providence
- Raleigh
- San Francisco
- Seattle
- Shanghai
- Singapore
- Stamford
- Toronto
- Vancouver
- Washington, DC

Culture is Key

At every level



How to reach all staff? All projects?

- Material Health committee
- Material Library Working Group
- Initiatives and Education

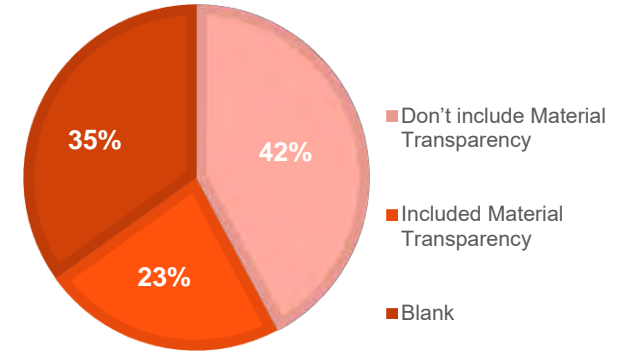
How to drive industry change and involvement?

- Members of mM AEC Leadership Forum
 - AIA leadership
 - Industry partners

Project Performance

Initial tracking and research

2022: projects required to identify **at least 10 products** with associated transparency documentation



*from a total of 275 reported projects during 2022

General

*Project Category

*Estimated Occupancy Year

+20% water reduction

*Will Energy Use Data be Collected?

Measured Energy Use Intensity (kBTU/sf/yr)

Daylight Simulation

*Construction Type

*Material Transparency 10+ Products

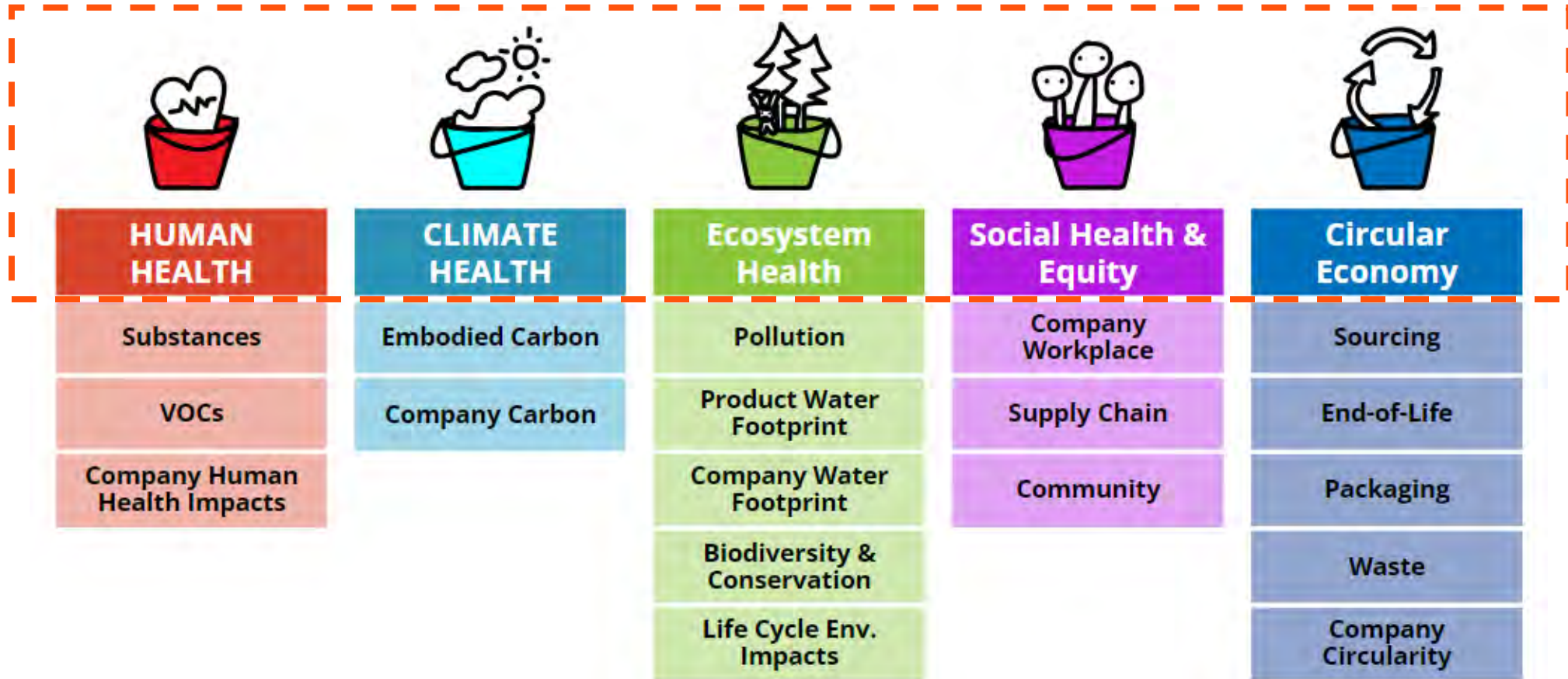
Embodied Carbon Consideration

-2023-

GOALS **research** **STRATEGIES** **design** **RESULTS** **feedback**

Project Performance

Setting up goals



Credit: mM Common Materials Framework, "Buckets and Sub-buckets".

Key considerations and resources

General criteria, tools, and guidance

Whether is advocacy, general questions and communication, guidance, first steps, or ideas; is here:





High Impact Categories

- High Touch areas
- High Volume products
- Notable chemicals of concern



3rd Party Standards

Don't rely on claims!



A+ Effort

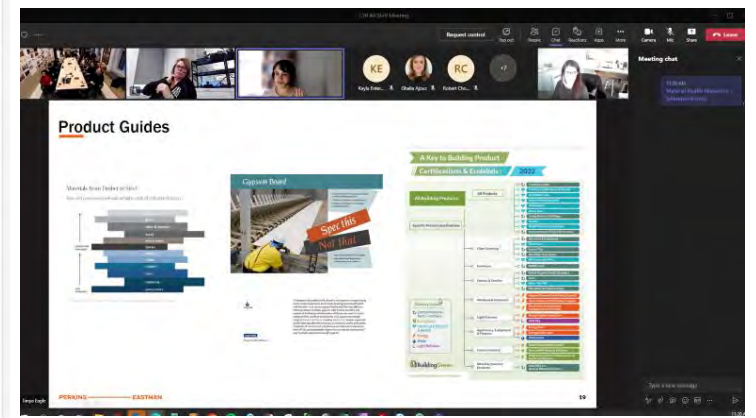
We're not experts, and that's ok!



Team Work

Work with manufacturers that want to work with you

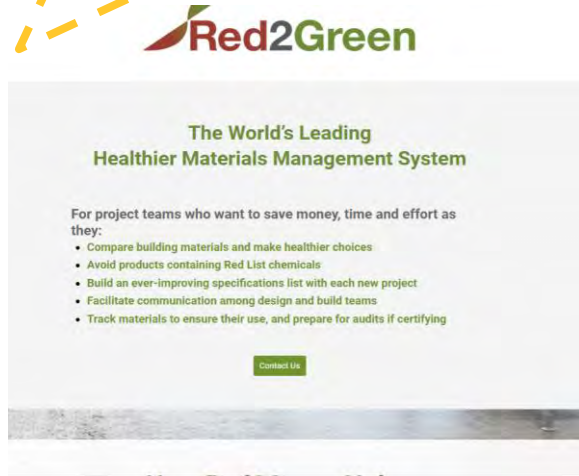
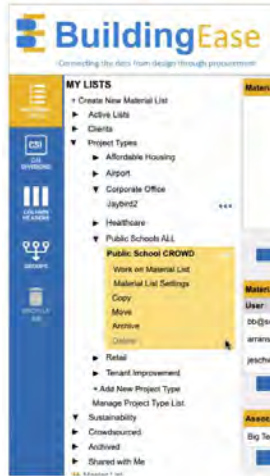
Sustainability Team	Perkins Eastman Resources	AIA Materials Resources
LEED and WELL Accreditation	<p>PE Materials Matrix Use this tool to assist in vetting materials for their impact on human and environmental health. This spreadsheet should also be used on all projects to track 10 products with associated transparency documentation.</p> <p>PE Manufacturer Email Template Use this template with ALL of your manufacturers, to ensure that we are capturing necessary information. As of 2022, Perkins Eastman is only accepting products that are entered in mindful Materials OR have at least one associated sustainability criteria, as outlined in this template.</p> <p>PE Materials Information Request Form Please provide this information request form to manufacturers before adding a product to PE materials libraries and/or when vetting a product for a project.</p> <p>Material Health Case Study Template Please use this template to capture the material health story for each of your projects.</p> <p>Material Health Teams Page Please join the Material Health at PE Teams page for discussion, information sharing, and more.</p> <p>Materials and Design at PE Presentation Slides from the 2021 Sustainability Roll-Out "Materials and Design at Perkins Eastman" presentation.</p> <p>Alphabet Soup: Material Health at PE presentation A guide to understanding common acronyms, certifications, and evaluations in Material Health. Presented July 2022.</p> <p>Material Health at PE: The Common Materials Framework Learn more about the Common Materials Framework, an exciting framework to more easily achieve material health goals on all of our projects. The 30 min video also provides a quick review of Perkins Eastman material health initiatives and requirements.</p> <p>Material Health Education Module 2020 Take a look at the PE Sustainability Material Health Education Module from 2020.</p>	<p>A&D Materials Pledge Starter Guide Download this free resource to get started with applying the Materials Pledge to your work.</p> <p>AIA Prescription for Healthier Materials A detailed implementation guide for incorporating healthier material choices in our work.</p> <p>How to Talk to Clients About Materials A short article with some useful tips on how to talk to clients about material health.</p> <p>Material & Product Guidance</p> <p>Six Classes of Chemicals Please see the Six Classes of Chemicals for a very useful system of categorizing harmful chemicals and avoiding those chemicals in product selection.</p> <p>BuildingGreen's "Spec This Not That" Useful guide for how to select better product types.</p> <p>BuildingGreen Guide to Product Certifications and Ecolabels The BuildingGreen Guide to Building Product Certifications & Ecolabels provides guidance on which certifications and labels are relevant, and why. Super useful guide to navigating dozens of green labels!</p> <p>Key to Building Product Certifications & Ecolabels BuildingGreen one-page visual guide to dozens of certifications and ecolabels, which products they apply to, and the main impact category for each label. Print this out and post in your material library!</p> <p>Building Green Product Guidance Building Green has compiled useful Product Guidance, organized by product category and type.</p> <p>Carbon Smart Materials Palette An Architecture 2030 resources aimed at providing embodied carbon material guidance.</p> <p>Healthy Building Network product guidance Healthy Building Network (HBN) provides concise guidance for common product types.</p> <p>ILFI's Red List The International Living Future Institute publishes a Red List of the most harmful chemicals found in our building products, and provides guidance on how to navigate these chemicals.</p> <p>Design For Freedom Report Informative report on how modern slavery is embedded in the built</p>
Sustainability Lead	<p>Materials Databases</p> <p>mindful Materials CMF Portal Create a free account with mindful Materials (mM) and search the new Common Materials Framework beta database of products with associated health & sustainability information. The AIA and multiple other industry groups have aligned with the Common Materials</p>	
Energy Policy		
Material Health		
Material Health at Perkins Eastman		
Human Health		
Ecosystem Health		
Climate Health		
Social Health & Equity		
Circular Economy		
Material Health Resources		
Resources		
Monthly Education Modules		
Recent		
Sustainability Lead		



Project Performance

Specifics of Tracking Tools

External tracking resources



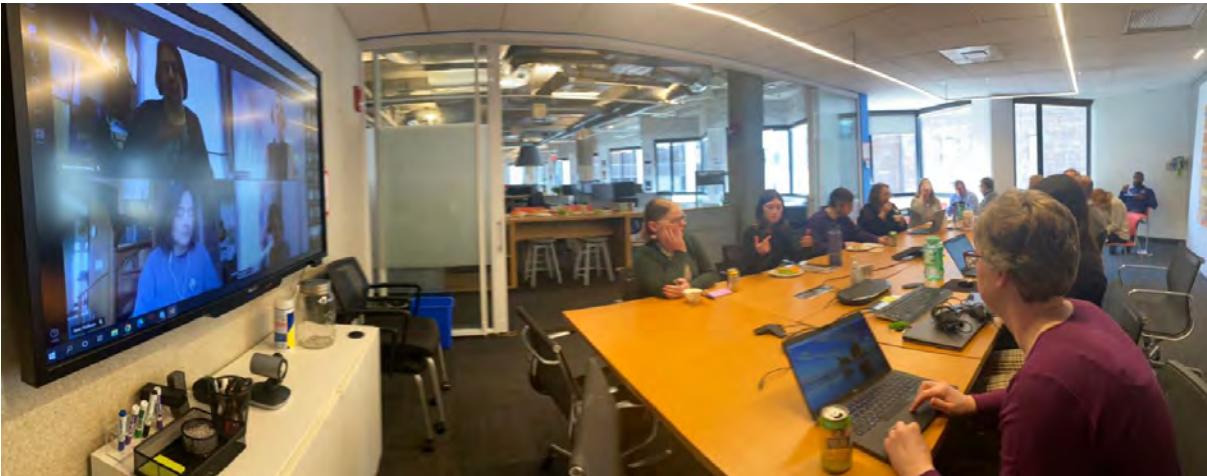
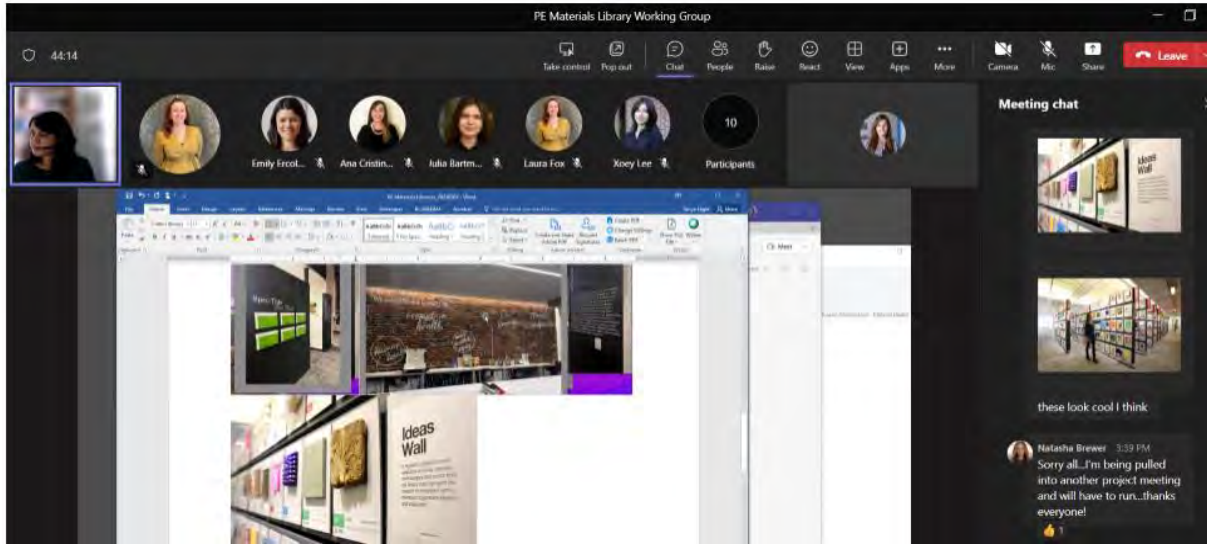
Internal tracking resources

A

B

Material Health: Library Working Group

Tailoring solutions



Perkins Eastman, Materials Library group monthly meeting. Below: Boston's "Healthy materials sessions" for the office, 2023.

PE Materials Information Request Form

What is the length of your product's warranty?

What is your product's anticipated Life Cycle? (Years)

AS SIGNATORIES OF THE A&D MATERIALS PLEDGE, PERKINS EASTMAN IS DEDICATED TO EVALUATING AND SELECTING MATERIALS FOR THEIR IMPACT ON THE HEALTH AND WELL-BEING OF OUR PEOPLE, OUR COMMUNITIES, OUR ECOSYSTEMS, AND OUR CLIMATE THROUGHOUT THEIR ENTIRE LIFE CYCLE.

Is your product included in the [Mindful Materials](#) database (preferred)?

Yes No

IF NO, PLEASE CHECK ANY OF THE QUALIFIERS THAT APPLY TO YOUR PRODUCT BELOW:

Human Health	Y/N
VOC Emissions Certified? (For paints & coatings, adhesives & sealants, flooring, wall panels, ceilings, and insulation, does the product meet CDPH Emissions requirements?) - Y, N, or NA	
VOC Content (g/L) Reported? - Y, N, or NA	
Wood Products are ULEP or NAIP? (CARB compliant)	
For furniture - is it compliant with ANSI/BIFMA Standard Method M7.1-2011 (R2016) and ANSI/BIFMA e3-2014e or e3-2019e Furniture Sustainability Standard?	
Fully Declared Health Product Declaration (HPD v2.2 or more recent) to 1000 ppm declaration included?	
C2C (version 2.1.1, 3.0, or more recent version) Certified?	
Red List Free?	
Contains Formaldehyde?	
Contains Highly Fluorinated Chemicals?	
Contains Anti-Microbials?	
Contains Flame Retardants?	
Contains Bisphenols and/or Phthalates?	
Contains mercury, arsenic, cadmium, or lead?	
Social Health & Equity	Y/N
Does your company have verified alignment with the ILO Fundamental Conventions?	
Does your company have a supplier code of conduct?	
Environment & Climate Health	Y/N

Perkins Eastman, Materials Request Form for materials vendors.

TOBIN MONTESSORI AND VASSAL LANE SCHOOL

A case study for Material Health



Perkins Eastman: TMVL south entrance. Project to be completed in 2025

Sustainability Goals

Aspirations for wellness

**Low
Energy
Load**

**Passive
Design**

**Increase
Open
Space**

**Increase
Tree
Canopy**

**Low
Embodied
Carbon**

**Resilient to
Flooding**

**Zero On-
Site
Greenhouse
Gas
Emissions**

**Healthy
Learning
Environments**

**Meter
Energy
Use**

**Limit
Water
Use**

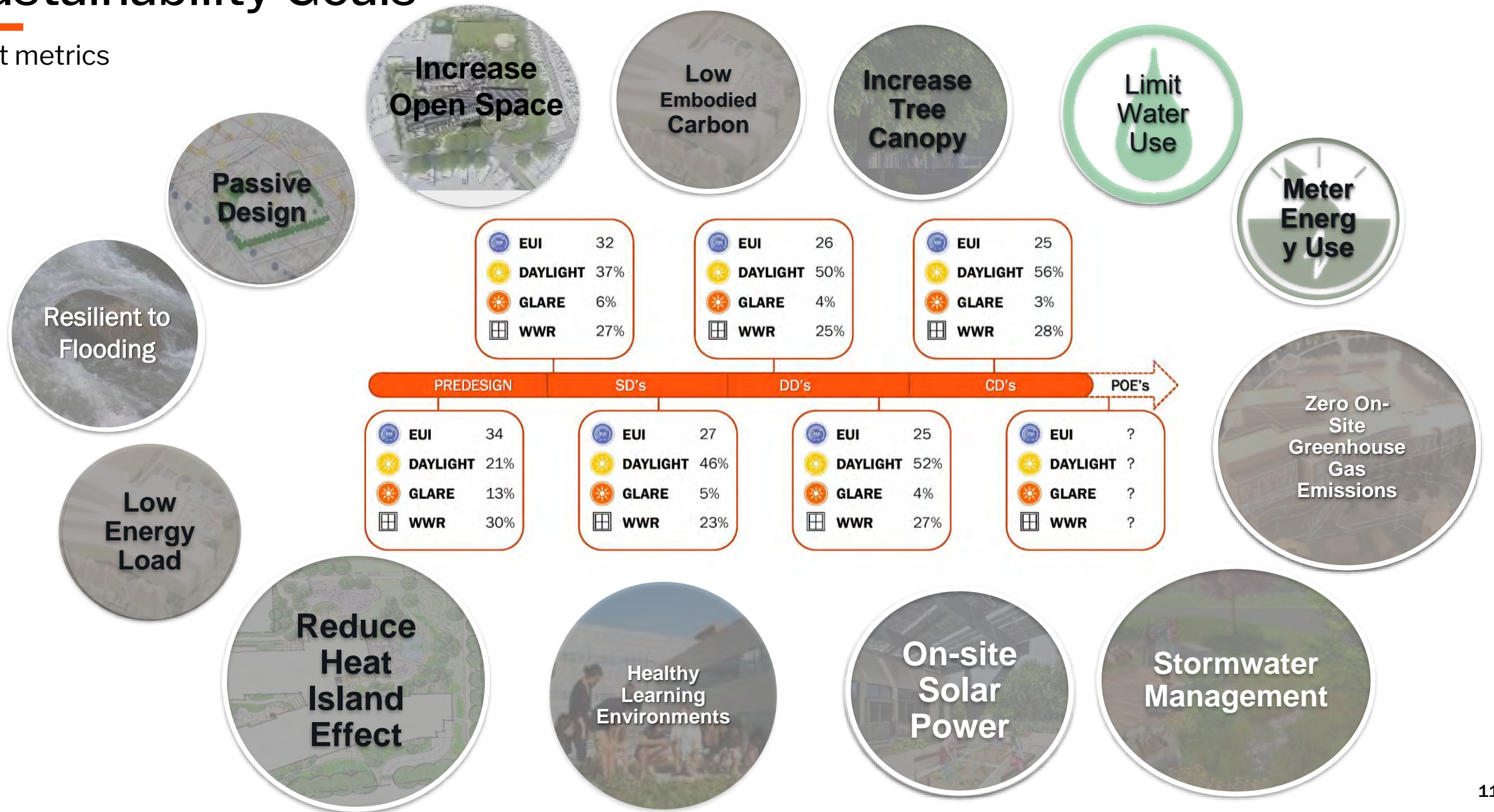
**Reduce
Heat
Island
Effect**

**Stormwater
Management**

**On-site
Solar
Power**

Sustainability Goals

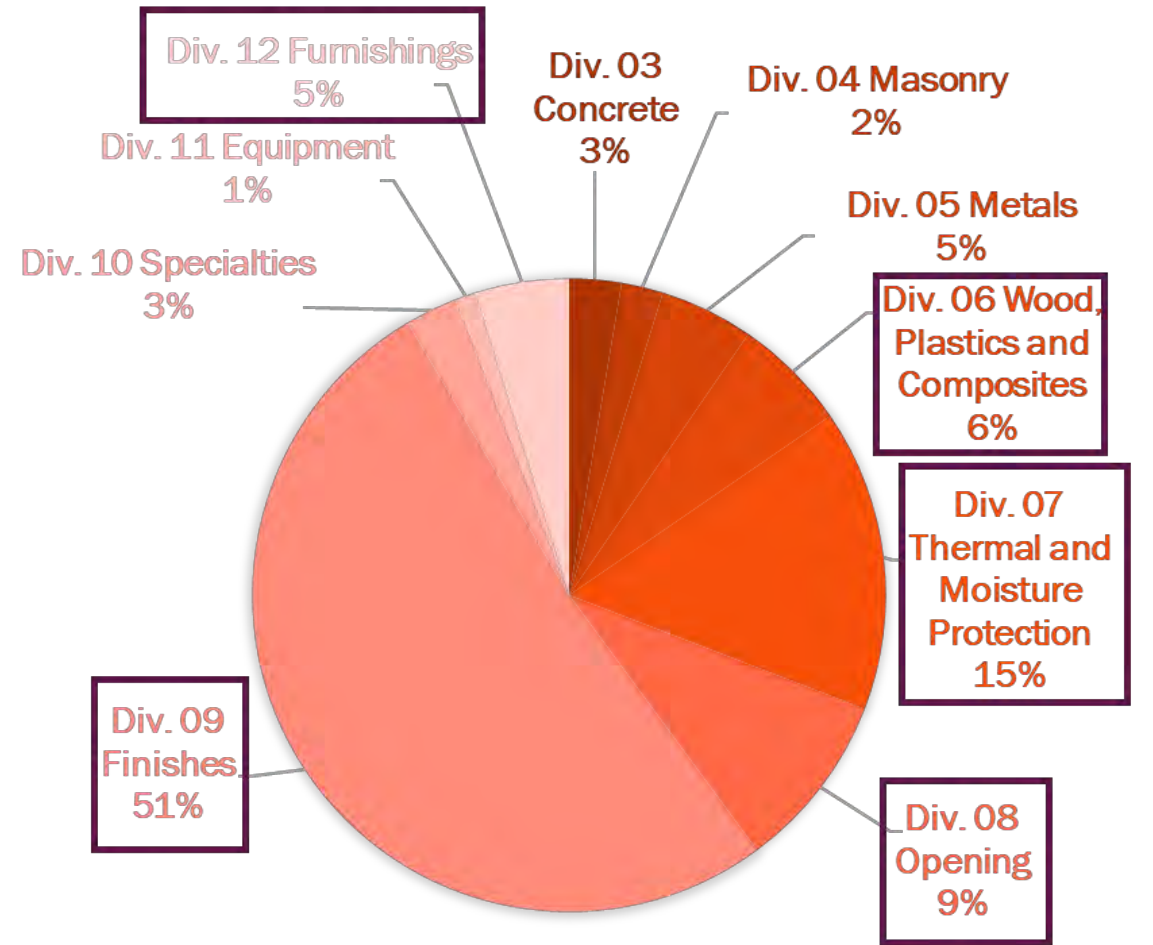
First metrics



Wellness through materials selection

Targeting for broader impact

TMVL MATERIAL LIST TRACKER														
TMVL Material List Tracker is for overview reference only. Refer to project's submittals and, including drawings and specifications, for more information.														
REV DATE: 07/18/2022														
Material Properties														
ID	Alt/Revision	EPD	GreenSource	Recycled Content (Min. Consumer)	Health Product Content (Min. 100 ppm)	Declare	Health Product Content (Min. 100 ppm)	Health Product Content (Min. 100 ppm)	Health Product Content (Min. 100 ppm)	Health Product Content (Min. 100 ppm)	Health Product Content (Min. 100 ppm)	Health Product Content (Min. 100 ppm)	Health Product Content (Min. 100 ppm)	Low End
Division 03 - Concrete														
1	Reinforcing Steel	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
2	Cast-in-Place Concrete	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
3	Mass Concrete	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
4	Reinforced Concrete	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
5	Architectural Concrete	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
Division 04 - Masonry														
6	CMU & masonry	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
7	Masonry Block	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
8	Stone	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
Division 05 - Metals														
9	Reinforcing Steel	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
10	Steel Connectors	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
11	Steel Decking	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
12	Cold Formed Framing	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
13	Hot Cold Formed Framing	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
14	Steel Fabrication	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
15	Hot Rolled Fabrication	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
16	Hot Dipped Galvanizing	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
17	Hot Metal Coatings	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
Division 6 - Wood, Plastics and Composites														
18	Rough Carpentry - Wood Beaming & Plycast	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
19	Rough Carpentry - Wood Composite Beams	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
20	Rough Carpentry - Adhesives	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
21	Exterior System Siding	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
22	Exterior Plywood Sheathing	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
23	Wood Composite Material Sheathing	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
24	Exterior Finish Wood	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
25	Interior Finished Wood	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
26	Wood composite flooring, adhesives, boards	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
27	Plastic Fabrication	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
28	Plastic Fabrication adhesives, sealants	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
Division 7 - Thermal and Moisture Protection														
29	Interior Fluid Applied Waterproofing membrane	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---
30	Tile Coatings	---	---	Recycled Min 25%	Health Prod. Min 100 ppm	---	---	---	---	---	---	---	---	---



*from a total of 200 researched materials.

Research in results

A tailored effort, including everyone.



HIGH-TOUCH & HIGH-QUANTITY HEALTHY MATERIALS SELECTIONS

TOBIN MONTESSORI & VASSAL LANE SCHOOL

22%

RED LIST FREE

40% - 65%

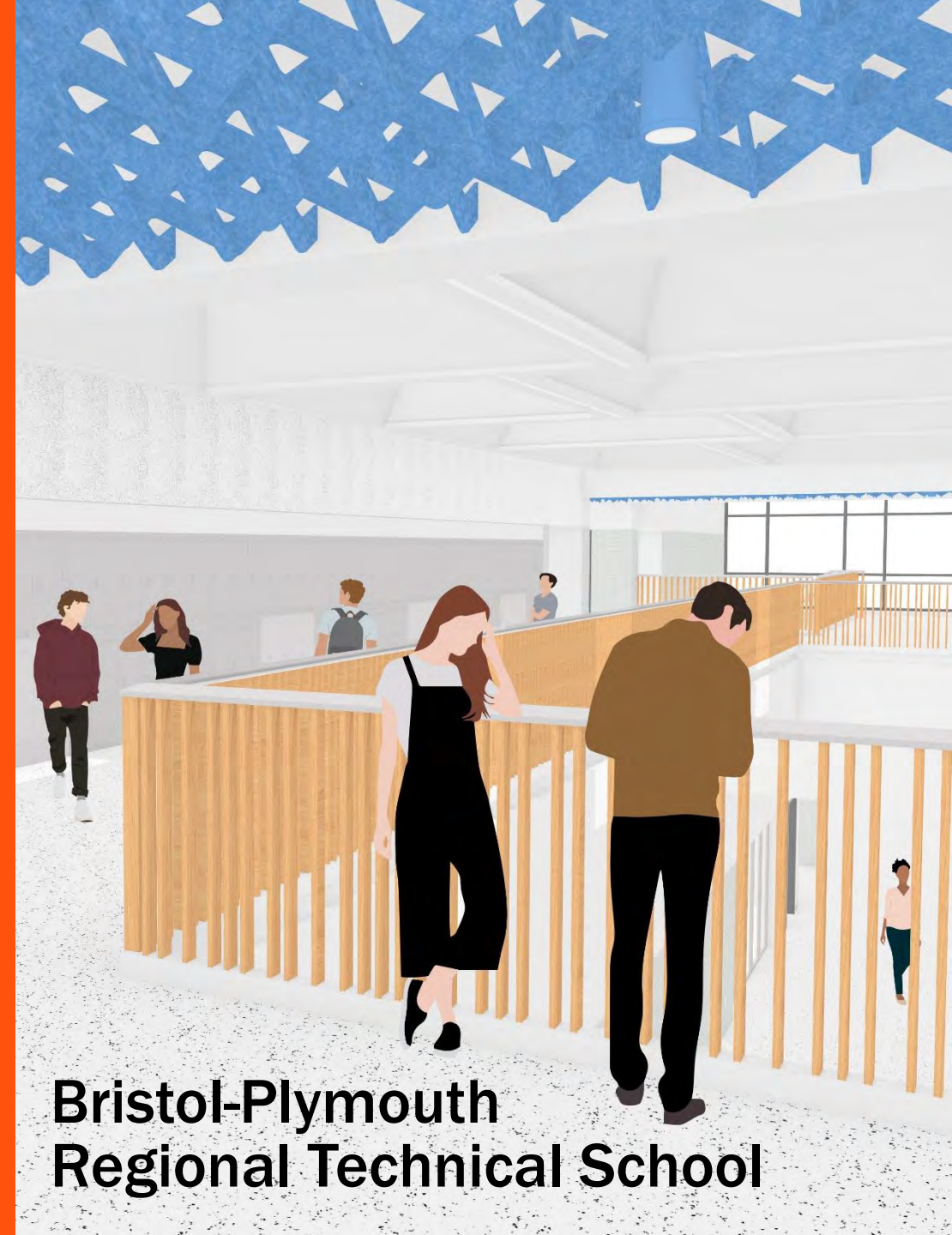
ENVIRONMENTAL PRODUCT DECLARATIONS (EPD) OR HEALTH PRODUCT DECLARATION (HPD) TO 1000 ppm, ORCDPH EMISSIONS TEST COMPLIANT

HMFH

Healthy Materials Pilot

partnership to eliminate
chemicals of concern inside public schools

Massachusetts School Building Authority



**Bristol-Plymouth
Regional Technical School**

Health & Wellness

10 factors for healthy school design:

1. Natural light and views
2. Acoustic control
3. Thermal comfort
- 4. Indoor environmental quality**
- 5. Healthy materials**
6. Engages and fosters community
7. Safe from outside dangers
8. Reduces bullying
9. Provides health resources
10. Supports an active lifestyle



Massachusetts School Building Authority

Pilot Program Partnership

- MSBA funding for Bristol-Plymouth is contingent on LEED for Schools certification
- Incentivizing Healthier Materials? Project Advisory 76 is a first step in the effort to address Material Health in Public Schools.
- Public Procurement Process Chapter 149/149A Project Delivery Method: Design-Bid-Build vs CM at Risk

‘The more you dig into it, you think, Oh, God.’ A growing mission seeks to reduce toxic chemicals in schools

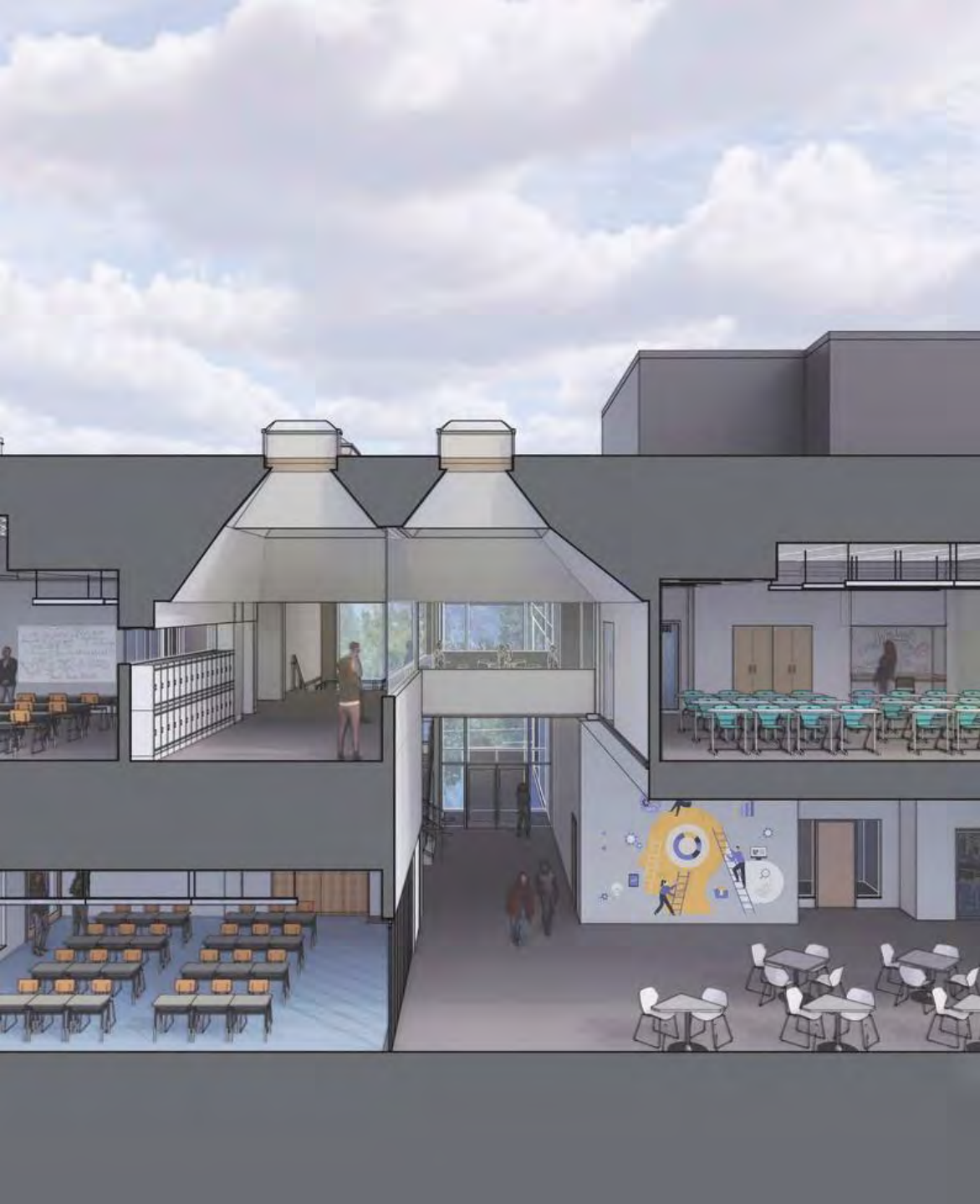
By **Kay Lazar** Globe Staff, Updated May 2, 2022, 7:15 a.m.



Jack McCarthy, executive director of the Massachusetts School Building Authority, aims to slash the number of toxic chemicals used in construction and renovation projects in the state's schools. JONATHAN WIGGS/GLOBE STAFF

The image is seared in Jack McCarthy's mind: a group of pre-kindergarteners gathered for story time, sitting in a circle on the carpet of a classroom, amid an invisible witches' brew of chemicals lurking in the dust on the floor.

Ever since he heard a talk a couple of years ago about health problems linked to flame retardants, stain repellents, and other potent building chemicals, McCarthy, executive director of the Massachusetts School Building Authority, has been on a mission to slash the number of such substances in the state's schools. His vision is taking hold in a \$305 million construction project for a new Bristol-Plymouth Regional



Bristol-Plymouth Regional Technical School

Products most in contact with occupants

- Ceiling panels
- Wall tile
- Marker boards
- Lockers
- Acoustic treatment
- Toilet partitions
- Doors
- Gym wall pads
- Wall graphics
- Stage drapery
- Wall paneling
- Window treatment
- Casework
- Loose furniture
- Resilient flooring
- Carpet

Material Health Goal

Eliminate chemicals of concern on high-touch surfaces inside the school

- **PFAS** in water, stain repellents, upholstery
- **Flame retardants** in window treatments, rebonded carpet padding, furniture foam, stage curtains
- **Phthalates** in vinyl flooring, paint coatings and caulk
- **Formaldehyde** in furnishings and casework



Work-in-Progress

Material Ingredient Declaration Status

- Transparency Labels
- Classes
- Red List
- Restricted Substances List
- Databases



ILFI Declare Labels



Cradle to Cradle



Green Science Policy Institute “6 Classes of Harmful Chemicals”

Pilot Program Product Criteria Ranking

TIER 1 - LBC Declare Label with Red List Free Status

Products that disclose 100% of ingredients present at or above 100ppm (0.01%) in the final product and do not contain any Red List chemicals

TIER 2 - LBC Declare Label with Red List Approved Status

Products that disclose a minimum of 99% of ingredients present in the final product and meet the Red List Imperative requirements through one or more approved exceptions

TIER 3 - Cradle to Cradle Gold

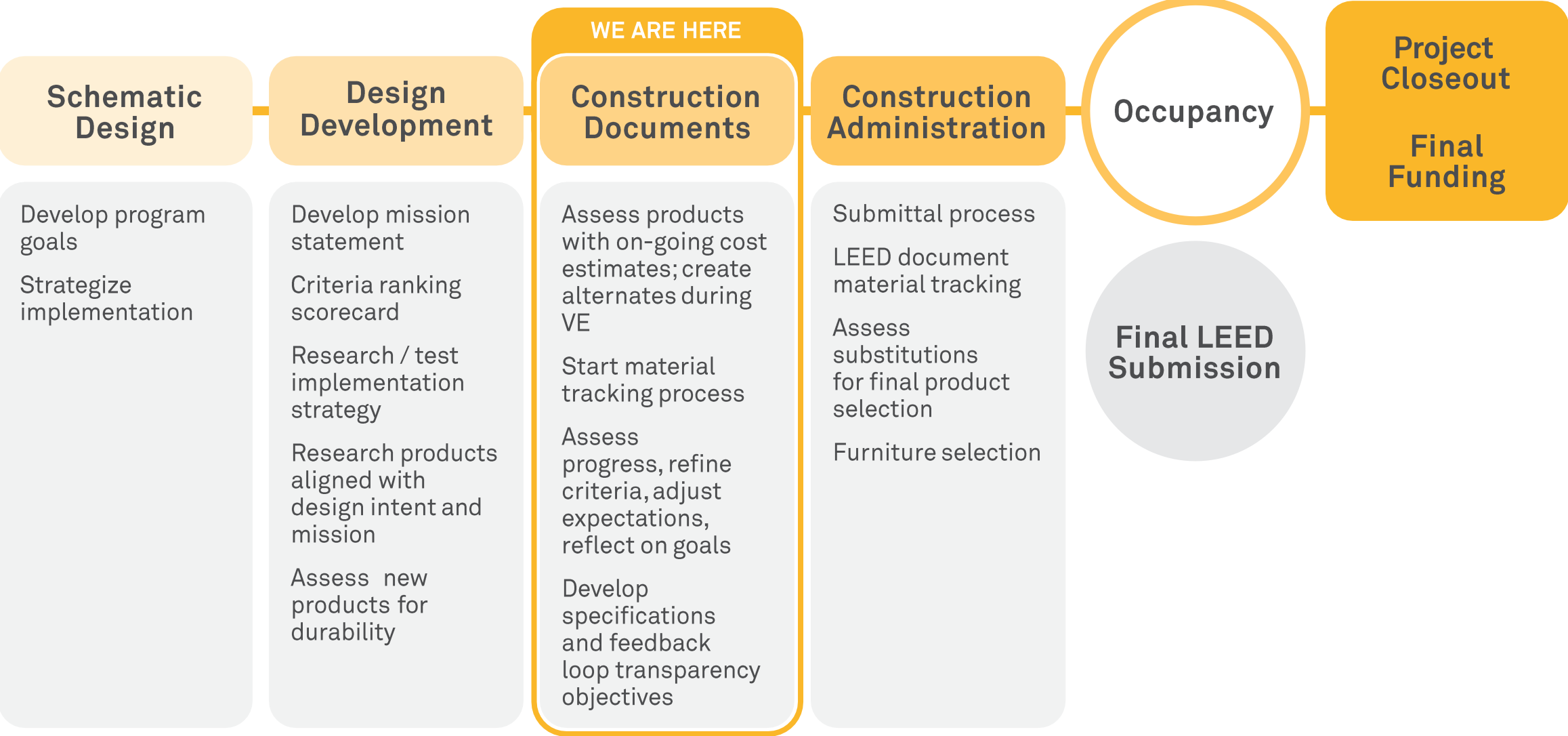
TIER 4 - Cradle to Cradle Silver

TIER 5 - LBC Declare Transparency Label

Products disclose 100% of ingredients present in the final product, but contain one or more Red List chemicals that are not covered by an approved exception

Minimum Requirement:
Every product specified requires an HPD/EPD or letter verifying none exists

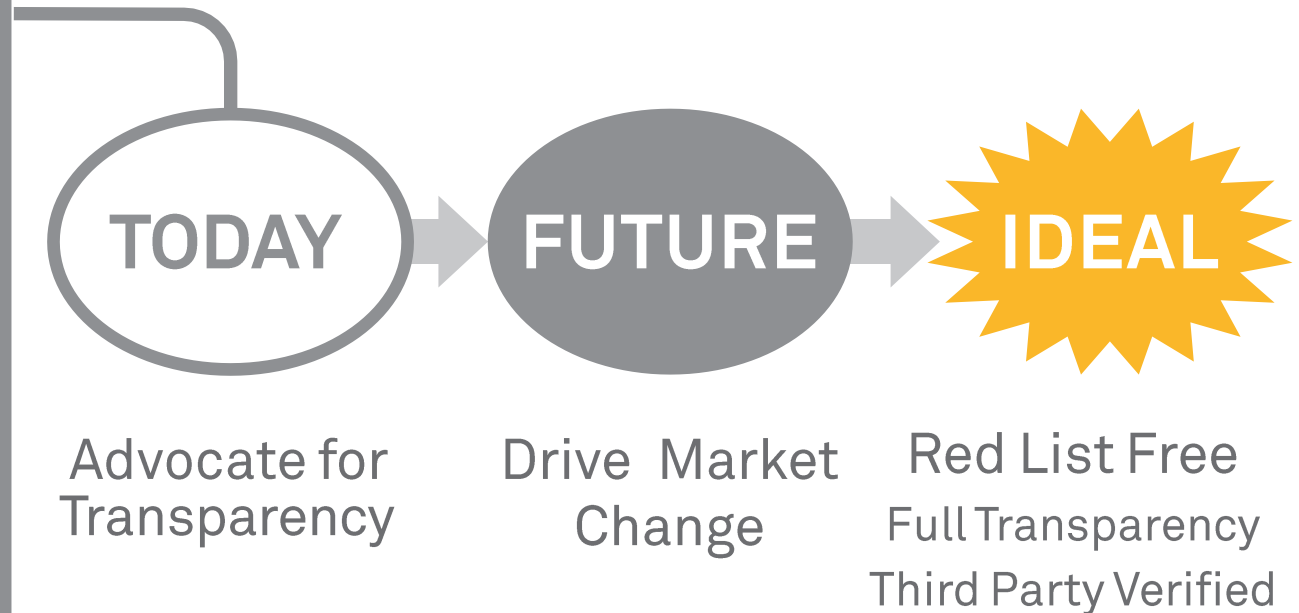
HMFH Process - Material Health Pilot Program



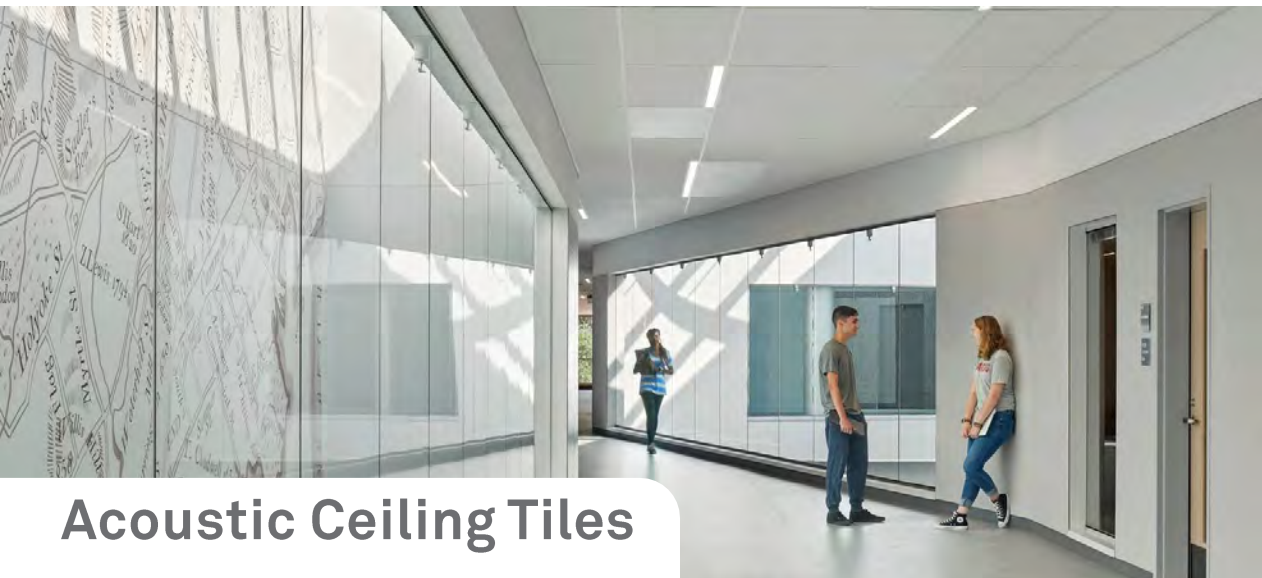
Specifications and Material Tracking

Refining our process is a work in progress

- Develop a feed-back loop with specs
- Specify EPDs/HPDs for all products
- Track product data and materials installed
- Prioritize manufacturers willing to evolve their product to meet goals
- Assess what we are doing right
- Learn what manufacturers are doing or plan to do relative to labels, certifications, recycled content



Easy Wins



Acoustic Ceiling Tiles



Wall Tile



Carpet



Resilient Flooring



Challenge

Gym Wall Pads & Divider Curtains

- Current product options lack transparency certifications
- Durability requirement often translates to products with Red List Chemicals (vinyl/PVC)





Challenge

Furniture & Casework

- Assessing furniture assemblies made of various components
- “Accessory Products”
- Options lack transparency certifications
- Durability often translates to Red List Chemicals (chemicals of concern)
- BIFMA LEVEL Certificaton



Challenge ➡ Easy Win

Window Treatment

- 2022 Massachusetts passes Legislation that effectively bans added chemical flame retardants to most window roller shades
- Compliant shades are PVC free and PFAS free
- How manufacturers respond to this legislation remains to be seen

NEXT STEPS

Lessons learned to scale up Material Health

- **Be accountable** for your choices.
- **Set goals** and measure progress
- **Demand transparency** from manufacturers
- Strategize with **like-minded individuals**
- Revise **specifications** to require transparency
- **Be proactive**, don't wait for legislation



Image by <https://metropolismag.com/climatetoolkit/> via Materials Bank

HOW ABOUT YOU...

Are you tracking?



What do you normally track?

What's the resource or database you are using?

Image by <https://metropolismag.com/climatetoolkit/> via Materials Bank

QUESTIONS?

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madalinekenedyhale@gmail.com

