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Participants will learn key drivers promoting “transparent” materials procurement practices, including an overview of “disclosure documents” to help consumers make informed specifications.

Participants will learn new tools which have emerged to promote “transparency”, including Materials Matter, AIA 2030 Products, and the Living Product Challenge.

Participants will learn about the concept of “hand-printing” as a means for promoting regenerative design practices.

Participants will gain insight into the similarities and differences between WELL, LEEDv4, and the Living Building Challenge in terms of what each requires for material “transparency”.

Key Learning Objectives

Thursday, March 09, 2017
10:30am – 12:00pm
A Spectrum of Positive Outcomes

BUILDING CODES

ENTRY LEVEL

ENERGY STAR

STRONG COMMITMENT

WELL

REGENERATIVE/TRANSFORMATIVE

Thursday, March 09, 2017
10:30am – 12:00pm
Blake Jackson

WELL, LEEDv4, & the Quest for Material Health
WELL, LEEDv4, & the Quest for Material Health

Thursday, March 09, 2017
10:30am – 12:00pm
Blake Jackson
 Traits of Both Parents

**LEED-NC**
- “Prerequisites” (7-13)
- “Credits” (~52)
- “Sections” (7)
- Min. Compliance “Certified”
- 50 points + 100% Prerequisites
- Certification 1-time

**WELL (NC)**
- “Preconditions” (26-41)
- “Features” (~100)
- “Concepts” (7)
- Min. Compliance “Certified”
- 0 points + 100% Preconditions
- Certification every 3 years

36 LEED credits overlap WELL  Designed to work with both systems

**Living Building Challenge**
- “Imperatives” (20)
- “Credits” (N/A)
- “Petals” (7)
- Min. Compliance “Petal Cert.”
- 3 of 7 Petals (Water + Energy + “X”)
- Certification 1-time

8 LBC imperatives overlap WELL

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Thursday, March 09, 2017
10:30am – 12:00pm
Blake Jackson
Priorities

Location & Transportation
Sustainable Sites
Water Efficiency
Energy & Atmosphere
Materials & Resources
Indoor Environmental Quality
Innovation in Design
Regional Priorities

Place
Water
Energy
Health & Happiness
Material
Equity
Beauty

Air
Water
Nourishment***
Light
Fitness***
Comfort
Mind

1994

2006

2015
Lifecycle Cost of Buildings (30+ Years)

People: 92
Operations: 6
Design/Const: 2

WELL, LEEDv4, & the Quest for Material Health

Thursday, March 09, 2017
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Other Drivers

Indoor VS outdoor cleanliness

Stress

Sedentary-ness

Indoor/Outdoor Disconnect
Wellness and the Body Systems

The components of the WELL Building Standard represent a comprehensive set of strategies organized by specific impacts on health and wellness. Many features of the WELL Building Standard are ascribed to one or more of the following body systems:

- Cardiovascular System
- Digestive System
- Endocrine System
- Immune System
- Integumentary System
- Muscular System
- Nervous System
- Reproductive System
- Respiratory System
- Skeletal System
- Urinary System
Materials Scope Within WELL

- AIR
- WATER
- NOURISHMENT
- LIGHT
- FITNESS
- COMFORT
- MIND

WELL, LEEDv4, & the Quest for Material Health

Thursday, March 09, 2017
10:30am – 12:00pm
Blake Jackson
Interior Paints & Coatings (100%)
- (100%, installed) CA Air Resources Board (CARB) 2007, Suggested Control Measures SCAQMD Rule 1113 (June 2, 2011)
- (90%, volume) CA Dept. of Public Health (CDPH) Standard Method v1.1-2010
- Applicable national VOC control regulations, or VOC testing (see ASTM/ISO referenced standards)

Interior Adhesives & Sealants
- (100%, installed) SCAQMD Rule 1168, July 1, 2005
- (90%, volume) CDPH Standard Method v1.1-2010
- Applicable national VOC control regulations, or VOC testing (see ASTM/ISO referenced standards)

Flooring
- Meet CDPH Standard Method v1.1-2010
- FloorScore still recognized by WELL & LEEDv4
AIR Feature 04 – VOC Reduction

**Insulation**
- CDPH Standard Method v1.1-2010 (impacts thermal and acoustic insulation in ceilings and walls)

**Furniture & Furnishings**
- (95%, cost) ANSI/BIFMA e3-2011 Furniture Sustainability Standard sections 7.6.1 and 7.6.2, tested in accordance with ANSI/BIFMA Standard Method M7.1-2011
level® has been created to deliver the most open and transparent means of evaluating and communicating the environmental and social impacts of furniture products in the built environment.
- Generate a plan compliant with Chapter 3 of the SF Environment Code Integrated Pest Management (IPM) program

- Only pesticides with hazard tier ranking 3 (least hazardous) per the City of San Francisco Department of the Environment’s (SFE) Reduced-Risk Pesticide List

- Appendix A to Article 37 “Boston Green Building Credits” includes IPM language
New Construction & Major Renovation
- No asbestos
- Lead limited to 100ppm (weight)

Lead Abatement
- On-site investigation by technician – US EPA 40 CFR Part 745.65 for residential dwellings or child-occupied facilities
- If hazards found, adherence to US EPA 40 CFR Part 745.227 (see multi-family dwellings)
- Adherence to final rules (US EPA RIN: 2070-AJ56) supersedes 40 CFR
Asbestos Abatement
- Inspect every 3 years: Asbestos Hazard Emergency Response Act (AHERA)
- Develop, maintain, and share asbestos AHERA-based management plan, including corrective actions (40 CFR part 763)
- Performa post-abatement clearance (AHERA, 40 CFR part 763)

Polychlorinated Biphenyl (PCB) Abatement
- If original pre-1950, conduct evaluation and abatement according to US EPA Steps to Safe PCB Abatement Activities and remove PCB-containing lighting ballasts per EPA guidelines

Mercury Limitation
- No new mercury containing thermometers, switches, and electrical relays
- Develop a plan to upgrade existing mercury-containing lamps to low-/zero-mercury lamps (Appendix C, Table A5)
- Allowable exit signage: Light-emitting diode (LED) and light-emitting capacitor (LEC) only
- No mercury vapor or probe start metal halide high intensity discharge (HID)
Polychlorinated Biphenyls (PCB’s) Illustrated

How Do PCBs Get Into the Fish I Eat?

1. Polychlorinated Biphenyls (PCBs) are chemicals that can be harmful to children and unborn babies. These chemicals were released by industries into the Fox River. Although industries have stopped releasing PCBs in the river since 1976, PCBs still remain.

2. Small marine life eat PCBs which are then eaten by fish. PCBs build up and are stored in the fat of fish. Larger, older fish high in fat have more PCBs than smaller, younger, and leaner fish.

3. People who eat a lot of fish containing PCBs store these PCBs in their body fat for many years.

4. PCBs can especially be harmful to children and unborn babies. A woman can pass PCBs onto her baby during pregnancy and breast-feeding. PCBs in children’s bodies can cause slower development and learning disabilities. Women who are pregnant or who intend to become pregnant and children under the age of 15 years should be very careful about the fish they eat.

209 Chemicals with common structure & varying number of attached chlorine atoms.

PCB’s are a level 1 PBT – Persistent Bio-accumulative Toxin
AIR Feature 17 – Direct Source Ventilation

All cleaning and chemical storage units, bathrooms, and all printers and copiers must be separated from adjacent spaces by self-closing doors and separate, non-recirculated exhaust.

Exceptions (Printers Only):
- Ecologo CCD 035
- Blue Angel RAL-UZ 171
- Green Star
AIR Feature 24 – Combustion Minimization

**Appliances:**
Combustion fireplaces, stoves, space-heaters, ranges and ovens are forbidden

***Sources:***
All combustion equipment to meet SCAQMD rules for pollution: internal combustion engines, furnaces, boilers, steam generators, process heaters, and water heaters

***Exhaust:***
Exterior idling limit: 30 seconds

***Equipment:***
Non-road diesel engines comply with US EPA Tier 4 PM standards, meet model year 2007 standards (or local equivalent), and all loading/unloading must take place away from air intakes and operable windows.

***Appendix A to Article 37 “Boston Green Building Credits” has combustion minimization language
Perfluorinated Compounds (PFC’s) – bioaccumulators/potent GHG:
Limited to **100ppm** in components constituting at least 5% weight of furniture or furnishing (drapes/curtains) assembly (*bioaccumulators*)

Halogenated Flame Retardants - carcinogenic:
Limited to **100ppm** (or code): window, waterproofing membranes, door/window frames, siding, flooring, ceiling tiles, wall coverings, piping, electrical cable, conduit, junction boxes, insulation, furniture, furnishings, textiles, and fabrics

Phthalates (plasticizers) – endocrine disruption:
Limited to **100ppm** in flooring and carpet, wall coverings, blinds, shades, shower curtains, furniture and upholstery

Isocyanate-based polyurethane – respiratory/carcinogenic:
**Forbiddenn** in interior finishes

Urea-formaldehyde – respiratory/carcinogenic:
Limited to **100ppm**: furniture, composite wood, laminating adhesives/resins, and thermal insulation
Flame Retardants & PFC’s Galore

1a) Waterproof Membrane
1b) Insulation
1c) Conduit
2) Furniture
3) Drapes
4) Carpet
5) Wall Coverings
6a) Electronics
6b) Window Frame

NFPA 285***

Source: www.transparency.perkinswill.com

WELL, LEEDv4, & the Quest for Material Health

Thursday, March 09, 2017
10:30am – 12:00pm
Blake Jackson
And Phthalates Too

1. DEHP
2. DBP
3. BBP
4. DINP
5. DIDP
6. DNOP (often in PVC)

*Guidelines on utensils & kitchenware
Meet 1 of 4 Options:

- Complete all Imperatives in Materials Petal under LBCv3.0

- **(25%, cost)** products, furnishings, built-ins, and interior finishes: no GreenScreen Benchmark 1, List Translator 1 or List Translator Possible 1 substances over 1,000ppm (verified by a toxicologist/industrial hygienist)

- **(25%, cost)** products, furnishings, built-ins, and interior finishes: Cradle-to-Cradle certification with V2-Gold+, or V3-Bronze+

- **(25%, cost)** products, furnishings, built-ins, and interior finishes (above combo)
**Equipment:**
Mops, rags, dusters must utilize microbial denier < 1.0

Cleaning products must be certified under the following: EPA Design for the Environment, UL Ecologo, and/or GreenSeal

Mops must not be hand-wrung

Vacuums must contain HEPA filtration

Chemical storage areas must segregate, label, and warn of the mixing of ammonia and bleach
**Cooking Material:**
Food preparation tools (except cutting boards) are to be homogenous: ceramic (no lead), cast iron, stainless steel, glass, coated aluminum, solid (non-laminated) wood untreated or treated with food-grade mineral or linseed oil.

**Cutting Surfaces:**
Cutting boards should be made of the following and removed when excessively worn: marble, plastic, glass, pyroceramic, solid (non-laminated) wood untreated or treated with food-grade mineral or linseed oil.

**Microwave Safe Kitchenware & Appliance Specifications**
- Circular Plates: 9.5” max.
- Non-circular Plates: 170in.sq. max.
- Bowls: 10oz. max.
- Cups: 8 oz. max.

**Miscellaneous (Other Preconditions & Optimizations)**
- Refrigerator: 247cu.ft. max. with visual display & removable drawer
- Minimum appliances: Microwave, Storage, and Dishwasher (*for LEEDv4, must be EnergyStar rated*)
- Food: to be organic/humane-certified, limits on trans-fat/sugar, transparent practices (awareness)
COMFORT Feature 70 – Ergonomics: Visual & Physical

- 100% Computer Screens: adjust depth/height
- 100% Chairs: adjust depth/height (HFES 100/BIFMA G1)
- 30% Workstations: sit/stand
Material Information:
(50% cost) of all interior finishes, materials, furnishings (including workstations) and built-ins must utilize some combinations of the following: Declare, HPD, or any method in LEEDv4 MR credit Building Product Disclosure Optimization – Material Ingredients, Option 1.

Accessible Information:
All declarations must be compiled and made accessible (digital and/or physical) as part of a printed manual and available to occupants.
Key Takeaways

- **Harmonization**: LEEDv4 (all suites)/Living Building Challenge(v3.0)
- **Eco-logos**: narrowed selection from trusted, 3rd-party verified sources
- **Lifecycle**: Design/Construction + Operations (green cleaning)
- **Total Design**: “Building to silverware” (complexity)
- **Scope Creep**: how do we deliver/sell such comprehensive services?
- **New Partners**: who do we involve beyond AEC (toxicologist)?
- **Fees**: Increased scope and administrative costs (recertification)
- **Commitment**: obligatory recertification (every 3-years) through verification
It’s a Process

Total Material Health

Optimize “Supply”

Understanding

Continual Refinement

Optimize “Demand”

Transparency

WELL, LEEDv4, & the Quest for Material Health
WELL, LEEDv4, & the Quest for Material Health
Fitwel Materials/Transparency Scope

- **No preconditions or prerequisites** – 144pt system (90 = 1 star; 105 = 2 stars; 125 = 3 stars)
- IPM included (2.66pts) without reference standard
- Asbestos-free interiors (4.66pts)
- Active workstations promoted (1.67) without min. threshold
- Healthy food & beverage/vending scope (7.00pts), references HHS/GSA Guidelines

**Unique section: EMERGENCY PREPAREDNESS:**
- Equipment/supply database (1.67pts)
- Install/test Automated External Defibrillator (2.66pts)
- Scheduled first-responder during occupied hours (1.00pts)
- Emergency address notification system (4.33pts)