AGENDA

2020-04-15  Part II

1:00 – 1:20    Health + Happiness Petal

1:20 - 2:20    Materials, Equity + Beauty Petals

2:20 – 2:45    Certification + Resources + FAQ

2:45 – 3:00    Wrap-up + Additional Questions
HEALTH + HAPPINESS

Fostering Environments that Optimize Physical and Psychological Health and Well Being

I-09 HEALTHY INTERIOR ENVIRONMENT
I-10 HEALTHY INTERIOR PERFORMANCE
I-11 ACCESS TO NATURE
The intent of this Imperative is to promote good indoor air quality and a healthy interior environment for project occupants.

All projects must:

- Comply with the current version of ASHRAE 62, or international equivalent.

- Prohibit smoking within any buildings or enclosed spaces, and within 25’ of any building opening, including air supply vents.

- Develop a Healthy Indoor Environment Plan specific to the project’s building type and location. The plan must address cleaning protocols, the prevention of particulates and toxins through an entry approach and implementation of at least one strategy to improve air quality.

- Provide views outside and daylight for 75% of occupants.

- Provide direct exhaust for kitchens, bathrooms, and janitorial areas.
HEALTH + HAPPINESS

CORE IMPERATIVE

09

HEALTHY INTERIOR ENVIRONMENT

☐ Projects must comply with the most current version of ASHRAE 62

🟦 Prohibit smoking within 25’ of an opening

🟠 Develop a Healthy Indoor Environment Plan

🟦 Provide 75% of occupants access to views and daylight

☐ Include direct exhaust for kitchens, bathrooms and janitorial areas

New Imperative
New Requirement
Moved Requirement
Adjustment
Expanded Option
STRATEGIES FOR IMPROVING INDOOR AIR QUALITY
VENTILATION

ASHRAE 62 compliant

Direct exhaust

Smoking prohibited within 25’
ENTRY SYSTEMS

Dirt walk-off system for particulate reduction
DAYLIGHT AND VIEWS
The intent of this Imperative is to demonstrate ongoing high-quality indoor air and a healthy indoor environment.

To promote good indoor air quality performance, all projects must:

• Provide the results from an Indoor Air Quality test one to six months after occupancy, or provide readings from an ILFI-approved continuously monitored indoor air quality system.\(^\text{25}\)

• Comply with the CDPH Standard Method v1.1-2010 (or international equivalent) for 90% of interior building products that have the potential to emit volatile organic compounds (VOCs).

• Implement a cleaning protocol that uses cleaning products that comply with the EPA Safer Choice label (or international equivalent, such as Globally Harmonized System [GHS]).\(^\text{26}\)

All projects must provide 95% of occupants access to views and daylight and opportunities for the remaining five percent of occupants to move to compliant spaces for a portion of their day.\(^\text{27}\)

In addition, all projects must provide at least two of the following:

• Sufficient operable windows to provide natural ventilation for at least six months of the year.

• Ability for the occupants to influence their local airflow and temperature through direct input or controls.

• Flexible options for working and learning such as sit/stand options and/or varied sensory experiences for living, working or learning.

Residential projects must provide operable windows for 100% of the project occupants.

\(^\text{25}\text{}\) Testing protocols must be consistent with the United States Environmental Protection Agency Compendium of Methods for the Determination, or international equivalent. Continuous monitoring must address specific pollutants and verification standards. Refer to the v4.0 Health + Happiness Petal Handbook for the exceptions and clarifications.

\(^\text{26}\text{}\) www.epa.gov/dsg/hazcom/global.html

\(^\text{27}\text{}\) Refer to the v4.0 Health + Happiness Petal Handbook for daylight compliance options.
Conduct one Indoor Air Quality Test after occupancy

CDPH requirements for 90% of interior building products with potential to emit VOCs

Implement a cleaning protocol

Provide access to views and daylight for 95% of occupants and policies to address other occupants

Allow occupant influence over their environment and/or seating options
CLEANING PROTOCOLS

EPA Design for Environment
IAQ TESTING or MONITORING

- Carbon Dioxide
- Carbon Monoxide
- Respirable Suspended Particulates
- Total Volatile Organic Compounds
VOC LIMITS

Comply with CDPH Standard Method v1.1-2010
OPERABLE WINDOWS
FLEXIBLE OPTIONS FOR LIVING, WORKING, AND LEARNING
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FLEXIBLE OPTIONS FOR LIVING, WORKING, AND LEARNING
The intent of this Imperative is to provide opportunities for project occupants to directly connect to nature, and to assess the success of the Health + Happiness Imperatives.

All projects must connect people and nature through the provision of sufficient and frequent human-nature interactions in both the interior and the exterior of the project to connect the majority of occupants with nature directly.

All projects must request that occupants complete a post-occupancy evaluation that addresses the health benefits of the project including the benefits of daylight, fresh air and access to nature at least once within six to twelve months of occupancy.
HEALTH + HAPPINESS

IMPERATIVE

11
ACCESS TO NATURE

- Provide human-nature interactions
- Complete a post-occupancy evaluation which addresses health benefits

New Imperative
New Requirement
Moved Requirement
Adjustment
Expanded Option
SUFFICIENT AND FREquent
HUMAN-NATURE
INTERACTION
SUFFICIENT AND FREQUENT HUMAN-NATURE INTERACTION
AIR

23.5% reduction in headache symptoms when provided outside air.

69% reduction in asthma when schools upgraded to displacement ventilation to increase fresh air.

14.4% improved standardized math test scores in ventilation rate higher than 4.5 l/s per person.

57.1% reduction in sickness absence & 16.7% reduction in doctor visits when people had access to natural ventilation.
LIGHT

6-7% faster problem solving when seated with view to vegetation.

19% reduction in headaches when access to task lighting

26-41% reduction in length of hospital stay in bright sunlight room.

10-15% increased mental function and memory recall when access to view.

7-26% higher test scores in children with access to natural daylight.

Evidence has shown that natural daylighting can improve nursing performance, leading to a decrease in errors.
What opportunities do you see for your project?

Q&A
MATERIALS
Building with Products that are Safe for All Species Through Time

I-12 RESPONSIBLE MATERIALS
I-13 RED LIST
I-14 RESPONSIBLE SOURCING
I-15 LIVING ECONOMY SOURCING
I-16 NET POSITIVE WASTE
The intent of this Imperative is to set a baseline for transparency, sustainable extraction, support of local industry and waste diversion for all projects.

All projects must positively impact the building products market by meeting the following materials selection criteria:

- The project must contain one Declare label product per 200 sq m of gross building area, or project area, whichever is smaller, up to twenty distinct products from five manufacturers. All other product manufacturers not currently in Declare must, at a minimum, receive a letter requesting they disclose their ingredients and identify any Red List content.28

- All projects (except residential) must incorporate one product certified under the Living Product Challenge.29

- 50% of wood products must be FSC, salvaged, or harvested on site either for the purpose of clearing the area for construction or to restore or maintain the continued ecological function of the site. The remainder must be from low risk sources.30

- 20% or more of the materials construction budget must come from within 500 kilometers of construction site.31

- The project must divert 80% of the construction waste material from the landfill and provide dedicated infrastructure for the collection of recyclables and compostable food scraps during occupancy.

When a project is targeting all Materials Imperatives, it is not necessary to document this Imperative, since all requirements are superseded by Imperatives 13-16.

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28 www.living-future.org/declare/  
29 www.living-future.org/lpc/  
30 The Nature, Economy and People Connected tool or equivalent must be used to assess risk: https://www.nepcon.org/sourcinghub/timber  
31 “Materials construction budget” is defined as all material costs and excludes labor, soft costs, and land. Declare products and salvaged materials may be counted at twice their value. Certain natural building materials may include labor cost in their calculation. Refer to the v4.0 Materials Petal Handbook for more information.
<table>
<thead>
<tr>
<th>Core Imperative</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project must incorporate (1) Declare label per 200 sm</td>
<td></td>
</tr>
<tr>
<td>Include (1) product with Living Product Challenge certification</td>
<td></td>
</tr>
<tr>
<td>20% of materials by cost must be from within 500 km</td>
<td></td>
</tr>
<tr>
<td>50% of wood must be FSC, salvaged, or harvested on-site</td>
<td></td>
</tr>
<tr>
<td>Remainder of wood from low-risk sources</td>
<td></td>
</tr>
<tr>
<td>Divert 80% of construction waste materials from landfills</td>
<td></td>
</tr>
</tbody>
</table>
LEAP FROGGED

Imperative 12 is the only Imperative that does not need to be documented for projects pursuing Materials Petal Certification or Living Certification
The intent of this Imperative is to foster a transparent materials economy free of toxins and harmful chemicals.

All projects must avoid the following Red List chemical classes in 90% of the project’s new materials by cost.  
32 “In situ” materials do not need to be removed or vetted for Red List chemical classes.  
33

- Antimicrobials (marketed with a health claim)
- Alkylphenols and related compounds
- Asbestos compounds
- Bisphenol A (BPA) and structural analogues
- California-banned solvents
- Chlorinated Polymers, including:
  - Chlorinated polyethylene (CPE)
  - Chlorinated polyvinyl chloride (CPVC)
  - Chloroprene (neoprene monomer)
  - Chlorosulfonated polyethylene (CSPE)
- Polyvinylidene chloride (PVDC)
- Polyvinyl chloride (PVC)
- Chlorobenzenes
- Chlorofluorocarbons (CFC) and hydrochlorofluorocarbons (HCFC)
- Formaldehyde (added)
- Monomeric, polymeric and organophosphate halogenated flame retardants (HFRs)
- Organotin Compounds Perfluorinated compounds (PFCs)
- Phthalates (orthophthalates)
- Polychlorinated biphenyls (PCBs)
- Polycyclic aromatic hydrocarbons (PAHs)
- Short-chain and medium-chain chlorinated paraffins
- Toxic heavy metals
  - Arsenic
  - Cadmium
  - Chromium
  - Lead (added)
  - Mercury
- Volatile organic compounds (VOC) (wet-applied products)*
- Wood Treatments containing creosote or pentachlorophenol

*VOCs are limited, not banned. Refer to the v4.0 Materials Petal Handbook for specific reference standard + thresholds.

32 Refer to the v4.0 Materials Petal Handbook for complete and up-to-date listings of the numerous Red List exceptions. For purposes of the Living Building Challenge, “Materials” includes systems furniture and excludes FF&E.
33 A list of CAS registry numbers that correspond with each Red List item is available and should be projects based on their date of registration. Materials deemed hazardous by a remediation professional must be addressed appropriately.
Avoid Red List chemicals in 90% of the project’s new materials by cost

Red List now grouped by chemical class

3 New chemical groups

2 Consolidated chemical groups

7 Renamed chemical groups to harmonize with industry standards

New process for updates
<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>EINECS Number</th>
<th>Rationale</th>
<th>Red List Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aralinone</td>
<td>627-96-6</td>
<td>212-475-1</td>
<td>High toxicity to aquatic life</td>
<td>2</td>
</tr>
<tr>
<td>2,3-Dimercaptopropanol</td>
<td>76-89-2</td>
<td>200-641-1</td>
<td>Low acute toxicity</td>
<td>2</td>
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<tr>
<td>Alocine</td>
<td>75535-36-4</td>
<td>25344-37-1</td>
<td>High mobility</td>
<td>3</td>
</tr>
<tr>
<td>Anabasine</td>
<td>56-38-5</td>
<td>200-671-3</td>
<td>High acute toxicity</td>
<td>2</td>
</tr>
<tr>
<td>Anachemycin</td>
<td>36559-98-5</td>
<td>249873-80-1</td>
<td>High chronic toxicity</td>
<td>3</td>
</tr>
<tr>
<td>Acridine</td>
<td>34989-92-5</td>
<td>200-689-0</td>
<td>High mutagenicity</td>
<td>4</td>
</tr>
<tr>
<td>Acrolein</td>
<td>107-03-3</td>
<td>200-695-6</td>
<td>High acute toxicity</td>
<td>2</td>
</tr>
<tr>
<td>Acorus Root</td>
<td>935-86-2</td>
<td>200-714-7</td>
<td>High chronic toxicity</td>
<td>3</td>
</tr>
<tr>
<td>Acidum</td>
<td>9000-50-4</td>
<td>200-728-0</td>
<td>High acute toxicity</td>
<td>2</td>
</tr>
<tr>
<td>Acidum Metabolite</td>
<td>9000-51-5</td>
<td>200-730-8</td>
<td>High chronic toxicity</td>
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THE PRECAUTIONARY PRINCIPLE

Take precautionary actions based upon the weight of available evidence and in the face of uncertainty.

“Better Safe Than Sorry” approach.

Delays in regulatory action require consideration of available evidence.
REGRETTABLE SUBSTITUTIONS

Bisphenol A

Manufacturers respond to international regulations and customer concerns by producing BPA-free plastics for babies and adults.

Bisphenol S

Thought to be more resistant to leaching, manufacturers opt for BPS, yet now 81% of Americans have BPS in their urine.
RED LIST GROUPED BY CHEMICAL CLASSES

19 Chemical classes harmonized with other restricted substance and authoritative hazard lists.

NEW CLASSES

- Antimicrobials (Marketed with a health claim)
- Organotin compounds
- Polycyclic aromatic hydrocarbons
NEW GROUPING OF EXISTING CLASSES

- Chlorinated polymers
  - Chloroprene
  - CPVC
  - PVC
  - PVDC
- Toxic heavy metals
  - Arsenic
  - Cadmium
  - Chromium VI compounds
  - Lead (added)
  - Mercury
NEW NAMING OR EXPANSION OF EXISTING GROUPS

- Alkylphenols and related compounds
- Asbestos compounds
- BPA structural analogues
- California-banned solvents
- Monomeric, polymeric and organophosphate halogenated flame retardants (HFRs)
- Short chain and medium chain chlorinated paraffins
- Volatile Organic Compounds (VOCs)
INTRODUCING THE LBC WATCH LIST

The LBC Watch List is intended to inform the continued evolution of the Red List

- Allows for greater harmonization with other restricted substance lists
- CAS Numbers will be published to the Watch List a minimum of 12 months before being moved to the Red List
The intent of this Imperative is to support sustainable extraction of materials and transparent labeling of products.

All projects must advocate for:

- The creation and adoption of third-party certified standards for sustainable resource extraction and fair labor practices for extraction of rock, metal, minerals, and timber.

- Certification under the Natural Stone Council (NSC) 373 Standard by quarries and/or manufacturers of all dimension stone products used within the project.34

All projects must either source 80% or more of all wood, by cost or volume, as Forest Stewardship Council (FSC) certified,35 or as salvaged, or from the intentional harvest of on-site timber for the purpose of clearing the area for construction or restoring/maintaining the continued ecological function of the on-site biocenosis, and the remaining 20% of wood must be from low-risk sources.36 Alternatively, the project may achieve FSC Project Certification.37

All projects must contain two Declare labeled products per 200 sqm of gross building area, or project area, whichever is smaller, up to forty products, and advocate to all manufacturers that are not in Declare that they register their products in the Declare database.38

All projects (except residential) must incorporate one product certified under the Living Product Challenge per 1,000 sq. m of gross building area or project area, whichever is smaller, up to three products.39 Residential projects must incorporate one product certified under the Living Product Challenge.

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34 http://naturalstonecouncil.org/education-training/nsc-initiatives/dimensional-stone-standard/
35 Refer to the v4.0 Materials Petal Handbook for a full list of exceptions, such as an exception for wood in existing buildings undergoing renovation.
36 The Nature, Economy and People Connected tool or equivalent must be used to assess risk; https://www.nepcon.org/sourcinghub/timber
38 www.living-future.org/declare/
39 www.living-future.org/lpc
Advocate for third-party certification standards for sustainable resource extraction and fair labor processes

80% of wood must be FSC Certified, salvaged, or intentionally harvested wood,

Or

The project can be FSC Certified

Remainder of wood from low-risk sources

Include (2) products with Declare labels per 200 sm*

Include (1) Living Product Certified product per 1000 sm*, up to (3).

of gross building area, or project area, whichever is smaller.
USING DECLARE TO MEET THE RED LIST REQUIREMENTS

Declare labels that are active (not expired) and valid (published to the Declare database) at the time of product selection may be used to document the Materials Petal requirements; changes to the product’s Declaration Status or participation in Declare at a later date will not negatively impact compliance.
INDUSTRY
ADVOCACY

National Trade Associations
ASTM International
3rd Party standards for sustainable practices
TIMBER

80% of wood must be:
Certified FSC 100% (preferred) or FSC Mixed (allowed)
Salvaged
Intentional harvest of timber onsite

Remainder must be:
from low risk sources
WHY FSC?

Gold Standard for Forest Management

Provides a holistic framework

Addresses key leverage points
- Toxins
- Community
- Climate health
- Transparency

Rewards proven performance
INVASIVE SPECIES

Pine beetle

Western juniper

Black locust
FSC PROJECT CERTIFICATION

Allows additional flexibility

Minimum 50% FSC or post-consumer reclaimed

Remainder FSC Controlled or other reclaimed
Timber Risk Assessments

Click to access country risk information and tools
Two Declare labeled products per 200 sq m of gross building area, or project area, whichever is smaller

Up to forty products

Advocate to all non-Declare manufacturers
WHAT IS DECLARE?

An ingredients label
An endeavor to increase transparency
An opportunity for manufacturers
A resource for project teams
Declare labels answer three simple questions:
Where does a product come from?
What is it made of?
Where does it go at the end of its life?
DECLARATION
STATUS
LBC Red List Free
LBC Compliant
Declared
LIVING PRODUCT CHALLENGE℠ 2.0
A Visionary Path to a Regenerative Future

living-future.org/lpc/
LIVING PRODUCT CHALLENGE
47 Certifications
**Living Product Label**

**Humanscale Diffrient Smart Chair**

**Manufacturing Locations:**
- 35 Gateway, NJ, USA

**Life Expectancy:** 15 Years
**End of Life Options:**
- Take Back Program:
  - Salvageable/Reusable: 95%
  - Landfill: 5%
- Recycled Content: 76%
- Bio-Based Material: 0%
**Functional Unit:** 1 chair

**Carbon Impact**
- **CO₂**
  - 34.03 kg CO₂ eq

**Water Impact**
- **H₂O**
  - 483.8 gal

**Energy Impact**
- **KG**
  - 12,360.6 kg oil eq

**Waste Impact**
- **WASTE**
  - 93% Diversion Rate

**Declare**
- Red List Free
- LCIA Completed
- Declared 95%

**Just**
- 95% Assessed

**Ingredients:**
- Aluminum (A380 Alloy), Aluminum (ADCC), Steel, Polypropylene, Polyurethane, Nylon 6, Glass Fiber, Talc, Thermoplastic Polyurethane, Wrist, 1,3,5-Trisylpropylopolymer with 1,3-Disilanol, Zinc Stearate, Tetrahydrofuran, 1-Butene, Polyurethane, Butane, Brassy, Zinc Oxide, 1-Octene, Polymer with Ethylene, Acid Green 73, Polyethylene Terephthalate, Nylon 6,8, Trivalent Chromium Compound, Polyethylene, Sodium Sulfate, Proprietary Coating, Polyethylene, Terephthalate, Na-Mg-Al Silicate, Carbonate, Proprietary (0.09%)

**CERTIFIED LIVING**

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*LCRB Temp Exception/08-64 Property"
The intent of this Imperative is to foster local communities and businesses, while minimizing transportation impacts.

The project must incorporate place-based solutions and contribute to the expansion of a regional economy rooted in sustainable practices, products, and services.

Manufacturer location for materials must adhere to the following restrictions:

- 20% or more of the materials construction budget must come from within 500 kilometers of construction site.\textsuperscript{40}
- 30% of the total materials construction budget must come from within 1000 kilometers of the construction site or closer.
- An additional 25% of the materials construction budget must come from within 5000 kilometers of the construction site.
- The remaining 25% of materials may be sourced from any location.

\textsuperscript{40} “Materials construction budget” is defined as all material costs excluding labor, soft costs, and land. Declare products and salvaged materials may be counted at twice their value. Certain natural building materials may include labor cost in their calculation. Refer to the v4.0 Materials Petal Handbook for more information.
Manufacturer location for materials must meet established thresholds for the construction costs:
- 20% within 500 km
- 30% within 1,000 km
- 25% within 5,000 km
- 25% any location

Consultants are not limited by this Imperative.
LOCAL SOURCING
Respect for local human and environmental resources
Promotes accountability of businesses
Strengthens community ties
LIVING ECONOMY MULTIPLIERS

SALVAGE MATERIALS

DECLARE PRODUCTS

NATURAL MATERIALS (includes labor)

LIVING PRODUCT CHALLENGE
The intent of this Imperative is to integrate waste reduction into all phases of projects and to encourage imaginative reuse of salvaged “waste” materials.

All projects must strive to reduce or eliminate the production of waste during design, construction, operation, and end of life in order to conserve natural resources and to find ways to integrate waste back into either an industrial loop or a natural nutrient loop.41

All projects must feature at least one salvaged material per 500 square meters of gross building area or be an adaptive reuse of an existing structure.

All projects must create a Materials Conservation Management Plan that explains how the project optimizes materials in each of the following phases:

- Design Phase, including the consideration of deconstruction and appropriate durability in product specifications.
- Construction Phase, including product optimization and collection of wastematerials for reuse or recycling.
- Operation Phase, including a collection plan for extra consumables and durables.
- End of Life Phase, including a plan for adaptable reuse and deconstruction.

All projects must divert waste material from the landfill to the following levels (by weight or volume) during construction:

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>MINIMUM DIVERSION RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal</td>
<td>99%</td>
</tr>
<tr>
<td>Paper and cardboard</td>
<td>99%</td>
</tr>
<tr>
<td>Soil and biomass</td>
<td>100%</td>
</tr>
<tr>
<td>Rigid foam, carpet, and insulation</td>
<td>95%</td>
</tr>
<tr>
<td>All others – combined weighted average</td>
<td>90%</td>
</tr>
<tr>
<td>Demolition Waster</td>
<td>80%</td>
</tr>
</tbody>
</table>

All project types must provide dedicated infrastructure for the collection of recyclables and compostable food scraps.

Projects located on sites with existing infrastructure must complete a pre-building audit that inventories available materials and assemblies for reuse or donation.

41 Refer to the v4.0 Materials Petal Handbook for calculation details, clarifications, and exceptions.

42 Hazardous materials in demolition waste, such as lead-based paint, asbestos, and polychlorinated biphenyls (PCBs), are exempt from percentage calculations.
Create a Materials Conservation Management Plan that addresses how materials will be optimized

Incorporate one salvaged material per 500 sm if not reusing an existing building

Divert waste from landfills at the prescribed levels

Divert 80% of demolition waste from landfills

Perform a pre-building audit of any existing structures
CONSERVATION + REUSE
MANAGEMENT PLAN

DESIGN:
Eliminate needless finishes
Expose systems

CONSTRUCTION:
Reduce construction waste
90-100% diversion rate

OPERATION:
Recycling and Compost

END OF LIFE:
Designed for deconstruction
DECONSTRUCTION FOR SALVAGE
What opportunities do you see for your project?

Q&A
EQUITY
Supporting a Just, Equitable World

I-17  UNIVERSAL ACCESS
I-18  INCLUSION
The intent of this Imperative is to allow equitable access to, and protections from any negative impacts resulting from the development of, Living Building projects.

All projects must make all primary transportation, roads and non-building infrastructure that are considered externally focused (e.g. plazas, seating or park space) equally accessible to all members of the public regardless of background, age and socioeconomic class—including the homeless—with reasonable steps taken to ensure that all people can benefit from the project’s creation.43

Projects in Transects L3-L6 (except single-family residences) must provide for and enhance the public realm through design measures and features that are accessible to all members of society, such as street furniture, public art, gardens, and benches.

All projects must safeguard access for those with physical disabilities through designs meeting either the Principles of Universal design (United States Access Board), the Americans with Disabilities Act (ADA), and the Architectural Barriers Act (ABA) Accessibility Guidelines, or international equivalent.44

No project may block access to, nor diminish the quality of, fresh air, sunlight, and natural waterways for any member of society or adjacent developments. Projects must also appropriately address any noise audible to the public.

- Fresh Air: Projects must protect adjacent property from any noxious emissions that would compromise its ability to use natural ventilation. All operational emissions must be free of Red List items, persistent bioaccumulative toxicants, and known or suspect carcinogenic, mutagenic and reprotoxic chemicals.

43 Refer to the v4.0 Equity Petal Handbook for exceptions and clarifications regarding access.
44 Refer to the v4.0 Equity Petal Handbook for exceptions, such as those for private residences and historic structures. ADA and ABA Accessibility Guidelines are available online: www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-aba-standards
EQUITY

17

UNIVERSAL ACCESS

☐ Project should be accessible to the public

☐ Enhance the public realm

☑ Universal Design Principles

☐ Do not block access to fresh air, sunlight and natural waterways
ENHANCE THE PUBLIC REALM
ENHANCE THE PUBLIC REALM
Implement the 7 Principles of Universal Design
The Seven Principles of Universal Design

Principle 1: Equitable Use
Principle 2: Flexibility in Use
Principle 3: Simple and Intuitive to use
Principle 4: Perceptible Information
Principle 5: Tolerance for Error
Principle 6: Low Physical Effort
Principle 7: Size and Space for Approach and Use
ACCESS TO FRESH AIR
ACCESS TO SUNLIGHT
ACCESS TO WATER
Workforce development/training/community benefits agreements, registered apprentice programs, and similar programs are employed for 10% of the General Contractor’s project contracts, and/or project maintenance contracts.\textsuperscript{49}

In addition, all projects must either:

- include diverse stakeholders from vulnerable or disadvantaged populations in the design, construction and operations and maintenance phases at the following levels:
  - 20% of design contract and/or construction contracts, and 10% of maintenance contracts must be with JUST organizations that meet required levels for Diversity category, or are registered Minority, Woman, or Disadvantaged Business Enterprises (MWDBE) organizations, or international equivalent.\textsuperscript{50}
  - Workforce development/training/community benefits agreements, registered apprentice programs, and similar programs are employed for 10% of the General Contractor’s project contracts, and/or project maintenance contracts.
  - donate 0.1% of the construction cost to a regional, community-based nonprofit organization focused on equity and inclusion.

\textsuperscript{49} https://living-future.org/just: Just labeled “project team organizations” that are contracted to the owner can also count towards the 20% requirement below.
\textsuperscript{50} Required levels for either the Gender or Ethnic Diversity Indicators: One in Just 1.0, two in Just 2.0.
At least two organizations must have a Just label and five organizations must complete a Just self-assessment.

And

Include diverse stakeholders through design, construction and maintenance contracts, and provide workforce training:
- MWDBE Organizations
- Just Organizations meeting Diversity levels

Or

Donate 0.1% ($0.001) of total project cost to a community-based non-profit that emphasizes equity and inclusion.
THE SOCIAL JUSTICE LABEL

A social justice transparency platform and disclosure tool

A “nutrition label” for socially responsible organizations

Allows organizations to demonstrate leadership on social justice issues

Organization Name: LBC Designers
Organization Type: Architecture
Headquarters: Seattle, Washington
Office Locations: 30
Number of Employees: 2,500

Social Justice Indicators:

Diversity & Inclusion
- Gender Diversity
- Ethnic Diversity
- Inclusion
- Engagement

Employee Benefits
- Health Care
- Retirement Provision
- Family/Medical Leave
- Training/Education

Equity
- Full-Time Employment
- Pay-Scale Equity
- Freedom of Association
- Living Wage
- Gender Pay Equity

Stewardship
- Local Communities
- Volunteering
- Animal Welfare
- Charitable Giving
- Positive Products

Employee Health
- Physical Health
- Well-Being

Purchasing & Supply Chain
- Equitable Purchasing
- Supply Chain

THE SOCIAL JUSTICE LABEL 2.0
ABC-001 EXP. 12/30/2020

INTERNATIONAL LIVING FUTURE INSTITUTE™
Organization Name: ILFI
Organization Type: Non-profit
Headquarters: Seattle, Washington
Number of Employees: 43

Social Justice Indicators:

Diversity & Inclusion
- Gender Diversity
- Ethnic Diversity
- Inclusion
- Engagement

Equity
- Full-Time Employment
- Pay-Scale Equity
- Freedom of Association
- Living Wage
- Gender Pay Equity

Employee Benefits
- Health Care
- Retirement Provision
- Family/Medical Leave
- Training/Education

Stewardship
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Employee Health
- Physical Health
- Well-Being

Purchasing & Supply Chain
- Equitable Purchasing
- Supply Chain

THE SOCIAL JUSTICE LABEL 2.0
ABC-001 EXP. 12/30/2020

INTERNATIONAL LIVING FUTURE INSTITUTE™
BEREA COLLEGE
DEEP GREEN
STUDENT RESIDENCE
WORKFORCE DEVELOPMENT
What opportunities do you see for your project?

Q&A
BEAUTY
Celebrating Design That Uplifts the Human Spirit

I-19 BEAUTY + BIOPHILIA

I-20 EDUCATION + INSPIRATION
The intent of this Imperative is to connect teams and occupants with the benefits of biophilia and incorporate meaningful biophilic design elements into the project.

Projects must be designed to include elements that nurture the innate human/nature connection. Each project team must engage in a minimum of one all-day exploration of the biophilic design potential for the project. The exploration must result in a biophilic framework and plan for the project that outlines strategy and implementation ideas for the following:

- How the project will be transformed by deliberately incorporating nature through Environmental Features, Light and Space, and Natural Shapes and Forms.
- How the project will be transformed by deliberately incorporating nature’s patterns through Natural Patterns and Processes and Evolved Human-Nature Relationships.
- How the project will be uniquely connected to the place, climate, and culture through Place-Based Relationships. The project must meaningfully integrate public art and contain design features intended solely for human delight and the celebration of culture, spirit, and place appropriate to the project’s function.

The framework should include a record of the exploration day and goals for the project, as well as historical, cultural, ecological, and climatic studies that thoroughly examine the site and context for the project. The plan must contain methods for tracking biophilia at each design phase to ensure sufficient implementation of the framework.

51 Each of the biophilic design elements is outlined on table 1-1, p. 15 of Biophilic Design: The Theory, Science, and Practice of Bringing Buildings to Life by Stephen R. Kellert, Judith H. Heerwagen, and Martin L. Mador.
Include elements that nurture the innate human/nature connection

All-day biophilic design exploration, resulting in a biophilic framework and plan for the project

Integrate public art and include features solely for human delight
KELLERT’S BIOPHILIC DESIGN ELEMENTS & ATTRIBUTES

ENVIRONMENTAL FEATURES
- Color
- Water
- Air
- Natural ventilation
- Plants
- Animals
- Natural materials
- Views and vistas
- Façade greening
- Geology and landscape
- Habitats and ecosystems
- Fire

NATURAL SHAPES + FORMS
- Botanical motifs
- Tree and columnar supports
- Animal (mainly vertebrate) motifs
- Shells and spirals
- Egg, oval and tubular forms
- Arches, vaults, domes
- Shapes resisting straight lines and right angles
- Simulation of natural features
- Biomorphology
- Geomorphology
- Biomimicry

NATURAL PATTERNS + PROCESSES
- Sensory variability
- Information richness
- Age, change and the patina of time
- Growth and efflorescence
- Central focal point
- Patterned wholes
- Bounded spaces
- Transitional spaces
- Linked series and chains
- Integration of parts to wholes
- Complementary contrasts
- Dynamic balance and tension
- Fractals
- Hierarchically organized ratios and scales

LIGHT + SPACE
- Natural light
- Filtered and diffused light
- Light and shadow
- Reflected light
- Light pools
- Warm light
- Light as shape and form
- Spaciousness
- Spatial variability
- Space as shape and form
- Spatial harmony
- Inside-outside spaces

PLACE-BASED RELATIONSHIPS
- Geographic connection to place
- Historic connection to place
- Ecological connection to place
- Cultural connection to place
- Indigenous materials
- Landscape orientation
- Landscape features that define building form
- Landscape ecology
- Integration of culture and ecology
- Spirit of place
- Avoiding placelessness

EVOLVED HUMAN-NATURE RELATIONSHIPS
- Prospect and refuge
- Order and complexity
- Curiosity and enticement
- Change and metamorphosis
- Security and protection
- Mastery and control
- Affection and attachment
- Attraction and beauty
- Exploration and discovery
- Information and cognition
- Fear and awe
- Reverence and spirituality
The intent of this Imperative is to provide educational materials about the operation and performance of the project to the occupants and the public in order to share successful solutions and catalyze broader change.

All projects must provide:

• A Living Building Challenge Case Study.
• An annual open day for the public.\[^{52}\]
• A copy of the Operations and Maintenance Manual.\[^{53}\]

All projects (except single-family residential) must:

• Provide a simple brochure describing the design and environmental features of the project.
• Install interpretive signage that teaches visitors and occupants about the project.
• Develop and share an educational website about the project.
• Include one Living Future Accredited Professional on the project team.

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\[^{52}\] See v4.0 Beauty Petal Handbook for how this requirement applies to residential projects
\[^{53}\] See v4.0 Beauty Petal Handbook for how this requirement applies to residential projects
Provide educational materials including content for a Living Building Challenge Case Study, an annual open day to the public, and an Operations & Maintenance Manual

Non-residential projects should provide a brochure, signage, and an educational website

At least one Living Future Accredited Professional must be on the project team
<table>
<thead>
<tr>
<th>SYNERGIES WITHIN LBC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>12. RESPONSIBLE MATERIALS</strong></td>
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<td><strong>14. RESPONSIBLE SOURCING</strong></td>
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<td><strong>18. INCLUSION</strong></td>
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<td><strong>20. EDUCATION + INSPIRATION</strong></td>
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</tbody>
</table>
What opportunities do you see for your project?

Q&A
CORE GREEN BUILDING CERTIFICATION

A Best Practice Green Building Standard

INTERNATIONAL LIVING FUTURE INSTITUTE™
GOALS FOR CORE

Fill gap in the green building certification market

Provide a simple, holistic framework to address critical issues

Define high performance best practice for all buildings
ESSENTIAL ELEMENTS

Framework of ten best practices

Redefines high-performance green building to address critical issues

Fill a need in the green building certification market

Simple yet holistic

Requires a 12-month Performance Period
CORE IMPERATIVES

C1: Ecology of Place (I-01)
C2: Human-Scaled Living (I-04)
C3: Responsible Water Use (I-05)
C4: Energy + Carbon Reduction (I-07)
C5: Healthy Interior Environment (I-09)
C6: Responsible Materials (I-12)
C7: Universal Access (I-17)
C8: Inclusion (I-18)
C9: Biophilic Design (I-19)
C10: Inspiration + Education (I-20)
ILFI BUILDING CERTIFICATIONS
STEPPING UP TO A LIVING FUTURE

World class efficiency and characteristics, reinforcing a fossil fuel free future.
- 100% building energy load offset with on-site renewables, driving efficiency
- Pathway for premium off-site renewables for certain project types

Required Imperatives:

**C1** 01 Ecology of Place
**C2** 04 Human Scaled Living
**C3** 05 Responsible Water Use
**C4** 07 Energy + Carbon Reduction
**C5** 09 Healthy Interior Environment
**C6** 12 Responsible Materials
**C7** 17 Universal Access
**C8** 18 Inclusion
**C9** 19 Beauty + Biophilia
**C10** 20 Education + Inspiration

**ALL CORE IMPERATIVES**

**Water**
- 06 Net Positive Water

**Energy**
- 08 Net Positive Energy

**Materials**
- 13 Red List
- 14 Responsible Sourcing
- 15 Living Economy Sourcing
- 16 Net Positive Waste
- 20 Education + Inspiration

One pillar of deep regenerative design built on a holistic high-performance foundation.
All Core Imperatives are required, plus the remaining Imperatives to complete either the Water, or Energy or Materials Petal.

Summit of holistic aspiration and attainment; fully restorative.
All Imperatives must be achieved to certify:

- 01 Ecology of Place
- 02 Urban Agriculture
- 03 Habitat Exchange
- 04 Human Scaled Living
- 05 Responsible Water Use
- 06 Net Positive Water
- 07 Energy + Carbon Reduction
- 08 Net Positive Energy
- 09 Healthy Interior Environment
- 10 Healthy Interior Performance
- 11 Access to Nature
- 12 Responsible Materials
- 13 Red List
- 14 Responsible Sourcing
- 15 Living Economy Sourcing
- 16 Net Positive Waste
- 17 Universal Access
- 18 Inclusion
- 19 Beauty + Biophilia
LBC READY RECOGNITION

Recognizes initial efforts + intent to certify

Audit occurs anytime after construction

Based on construction completion + performance predictions

Ongoing energy + water monitoring required

Final Audit still required after 12-month performance period

Recognition is valid for 18 months

LBC Ready = LBC Certification

Replaces Preliminary Audit
VOLUME CERTIFICATION PILOT PROGRAM

For prototypes + portfolios

One site or multiple sites

Streamlined documentation + certification

Reduced fees

At least one 4.0
VOLUME CERTIFICATION
LBC 4.0 PILOT COMMITMENTS

King County

PCC Community Markets

the BLOCK project

Google

Community rebuilds

salesforce

Kingspan
What opportunities do you see for your project?

Q&A
RESOURCES
LIVING BUILDING CHALLENGE®

4.0

A Visionary Path to a Regenerative Future
## WHAT'S NEW IN LBC 4.0?

### CORE IMPERATIVE

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<thead>
<tr>
<th>PETAL</th>
<th>IMPERATIVE</th>
<th>New</th>
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ADDITIONAL RESOURCES
ON LIVING-FUTURE.ORG

Biophilic Design Guidebook and Map
Water Permitting Guidebook and Policy Case Studies
Materials specifications and lists from certified projects
FSC Guidance and resources
Impact Research
Living Future Europe
NOI Techpark  Voltastraße / Via Volta 13A  I-39100 Bozen / Bolzano
Tel. +39 0471 1957067  carlo.battisti@living-future.org
https://living-future.org
Living Future Collaboratives in Europe

= new last year
TAKE ACTION TODAY!

Become a Living Future Member
Members make meaningful change and receive special access to resources and events
membership@living-future.org
LFA acknowledges progressive thinking professionals that are working towards a living future

Register & Earn LFA CE Credits
living-future.org/lfa

CONTINUING EDUCATION
This event is approved for the following continuing education units:

4 LFA Foundational CE credits

<table>
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<th>REQUIREMENTS</th>
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<td>LFA Registration</td>
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<td>Renewal every 2 years</td>
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</tbody>
</table>

*Fees vary
Thank you!
Falënderim!
THANK YOU!

CARLO BATTISTI

carlo.battisti@living-future.org