LIVING BUILDING CHALLENGE™SM 4.0
A Visionary Path to a Regenerative Future

INTERNATIONAL LIVING FUTURE INSTITUTE™
LIVING BUILDING CHALLENGE™ 4.0

A Visionary Path to a Regenerative Future
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IMAGINE a building designed and constructed to function as elegantly and efficiently as a flower: a building informed by its bioregion’s characteristics, that generates all of its own energy with renewable resources, captures and treats all of its water, and that operates efficiently and for maximum beauty.

IMAGINE a city block or a college campus sharing resources from building to building, growing food, and functioning without a dependency on fossil fuel-based transportation.

IMAGINE true sustainability in our homes, workplaces, neighborhoods, villages, towns and cities—Socially Just, Culturally Rich and Ecologically Restorative™.
IT’S TIME TO CREATE A LIVING FUTURE AND A WORLD OF LIVING BUILDINGS
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**BALLARD EMERALD STAR ZERO ENERGY HOME, ZERO ENERGY CERTIFIED - SEATTLE, WA**

Image courtesy of Ballard Emerald Star Zero Energy Home
OUR GOAL IS SIMPLE. IN THE WORDS OF BUCKMINSTER FULLER—
TO MAKE THE WORLD WORK FOR 100% OF HUMANITY IN THE
SHORTEST POSSIBLE TIME THROUGH SPONTANEOUS COOPERATION
WITHOUT ECOLOGICAL OFFENSE OR THE DISADVANTAGE OF ANYONE.¹

The Living Building Challenge™ is an attempt to dramatically raise
the bar from a paradigm of doing less harm to one in which we view
our role as a steward and co-creator of a true Living Future. The
Challenge defines the most advanced measure of sustainability in
the built environment today and acts to rapidly diminish the gap
between current limits and the end-game positive solutions we seek.

The Challenge aims to transform how we think about every single
act of design and construction as an opportunity to positively
impact the greater community of life and the cultural fabric of
our human communities. The program has always been a bit of a
Trojan horse—a philosophical worldview cloaked within the frame
of a certification program. The Challenge is successful because it
satisfies our left-brain craving for order and thresholds, and our
right-brain intuition that the focus needs to be on our relationship
with and understanding of the whole of life.

As such the program is a philosophy first, an advocacy tool second,
and a certification program third. Within the larger Living Future
Challenge framework that covers the creation of all human artifacts
and edifices, the Living Building Challenge focuses on humanity’s
most abundant creations—its buildings. It is in essence a unified
tool for transformative thought, allowing us to envision a future
that is Socially Just, Culturally Rich and Ecologically Restorative.

Regardless of the size or location of the project, the Living Building
Challenge provides a framework for design, construction and
the symbiotic relationship between people, our community, and
nature. The Living Building Challenge calls for action to restore
the relationship between people and nature in an increasingly
urbanized world as we become more and more disconnected
from the world with which we evolved. It is a challenge to immerse
ourselves in such a pursuit—and many refer to the ability to do so
as a paradigm shift.

Projects that achieve Living Building® certification can claim to
be the greenest anywhere, and will serve as role models in their
communities for redefining the future of the built environment.
Whether the project is restorative, regenerative, or operates with
a net zero impact, it has a home in the construct of the Living
Building Challenge.

¹ The Living Building Challenge was the 2012 winner of the Buckminster Fuller
Prize, the world’s top award for socially responsible design.
Although it is ambitious to achieve all of the requirements of the Living Building Challenge, the performance-based approach creates a simplicity and ease of use: There are twenty simple and profound Imperatives that must be met for any type of project, at any scale, in any location around the world.

This Standard is decidedly not a checklist of best practices—the Imperatives of the Living Building Challenge are performance-based and position the ideal outcome as an indicator of success.

The specific methodology used to meet the expectations of the Living Building Challenge is not up to our Institute—but rather to the genius of the design teams, owners, and occupants themselves, who are expected to make informed and vested decisions appropriate to the project, place, and bioregion.

The Living Building Challenge is a holistic standard, pulling together the most progressive thinking from the worlds of architecture, engineering, planning, interiors, landscape design, and policy. It challenges us to ask these questions:

What if every single act of design and construction made the world a better place? If every intervention resulted in greater biodiversity and social equity; additional outlets for beauty and personal expression; a deeper understanding of climate, culture, and place; a realignment of our food and transportation systems; increased soil health; and a more profound sense of what it means to be a citizen of a planet where resources and opportunities are provided fairly and equitably?

A tall order to be sure.

The scale of change we seek is immense. But without recording these utmost visions and clarity of purpose, we as a society will never experience the type of future that is possible and necessary for our long-term survival. It is our belief that only a dozen years remain to completely reshape humanity’s relationship with nature and to realign our ecological footprint to be within the planet’s carrying capacity.

Incremental change has not been an option in the past decade, and in the coming one it must become an approach of the past.

Over the last thirty years, green building has grown to become the most important and progressive trend in the building industry. There have been huge steps forward in the design, construction and operation of buildings, and yet when compared with the rate of change that is required to avoid the worst effects of climate change and other global environmental challenges, our progress has been minute and barely recordable. That is why, with the launch of the Living Building Challenge 4.0 we are also releasing the Core Green Building Certification, defining the ten essential requirements that define a baseline for green building. It is time to build a bridge between the highest levels of mainstream green building certification programs and the Living Building Challenge and to propel the industry toward more Living Buildings.
The Living Building Challenge is an ever-evolving program shaped by the incredible experiences of our project teams as they continually break new ground. Over time, feedback from a diverse array of stakeholders actively using the challenge helps us understand how to refine and improve the program to have the greatest impacts.

Institute staff are also monitoring changes in the field and the market, and making adjustments to the program as needed to reflect current realities and opportunities. We also strive to keep raising the bar as we learn together, moving our projects closer still to the goal of a regenerative living future.

- The internal logic of the Living Building Challenge is based on pragmatic, tested experience with what has already been built in the marketplace. Each new Living Building adds further weight to the evidence that a world of Living Buildings is possible now.

- Because this Standard is continuously informed by the work that project teams are doing on the ground, Petal Handbooks clarify and consolidate the rules at a set point in time to provide a unified reference for project teams. The Dialogue (see page 70) provides an online platform for project teams to request further clarifications and new exceptions and search for articles by topic. A glossary of critical program definitions is provided on page 78.

- The Living Building Challenge does not dwell on basic best-practice issues, so it can instead focus on critical high-level goals. It is assumed that to achieve this aspirational standard, typical best practices are already being met and championed by the team’s expert consultants. The implementation of this Standard requires leading-edge technical knowledge, an integrated design approach, and design and construction teams well versed in advanced practices related to green building.

- Regional solutions are manifested in all Living Building Challenge projects due to a number of variables, including climate factors, building characteristics and community context. For example, becoming water-independent in the desert demands the evolution of a project’s design to emulate a cactus instead of a tree. The built environment will be richer, and the stress on our resources will lessen as more and more projects have this focus on an appropriate response to place.
LIVING BUILDING CHALLENGE 4.0 FOCUSES ON THE RELATIONSHIP BETWEEN IMPACT AND EFFORT

This revised version of the Living Building Challenge has been developed based on two goals: to simplify the program so the level of effort of teams is better aligned with their impacts, at both project and market scales; and to fill the gap between the highest levels of mainstream green building certifications, and the entry point to the Living Building Challenge. The resulting Standard is streamlined, eliminating time consuming requirements that were not directly influencing projects or markets. LBC 4.0 also raises the bar by requiring that teams address basic issues in all Petals, even if the project is primarily focused on a more limited scope of priorities. In addition, a number of new performance-based compliance paths have been added to increase flexibility for teams. These changes promise to relieve some of the frustrations of the previous versions, while maintaining the high standards and inspirational vision that the ILFI community expects from the Living Building Challenge.

A FEW KEY CHANGES INCLUDE THE FOLLOWING:

The Living Building Challenge now has ten Core Imperatives that address the fundamental tenets of each Petal. All the Core Imperatives are required for Petal Certification, and together they constitute the requirements of the new Core Green Building Certification. Notable updates in LBC 4.0 by Imperative include:

I-01 ECOLOGY OF PLACE includes a performance-based approach to the project location and local ecology and community.

I-02 URBAN AGRICULTURE introduces a secondary path to improve the accessibility to fresh food in conjunction with on-site food production. Required percentages of site area have been simplified and are now based on Transect rather than Floor Area Ratio (FAR). Food storage requirements are modified.

THE WATER PETAL has been divided into two Imperatives, Core and Living, and requires comparison to a baseline.

THE ENERGY PETAL has been separated into Core and Living Imperatives that incorporate an EUI minimum and embodied carbon.

I-09 HEALTHY INTERIOR ENVIRONMENT is now a Core Imperative that outlines baseline requirements to achieve good indoor air quality.

I-10 HEALTHY INTERIOR PERFORMANCE includes some of the previous requirements of LBC 3.1 Civilized Environment and Healthy Interior Environment plus some expanded options for fresh air and controls.

I-11 ACCESS TO NATURE is a new Imperative based on one of the previous requirements of the LBC 3.1 Biophilic Environment Imperative.

I-12 RESPONSIBLE MATERIALS is a new Core Imperative setting a materials baseline for all projects.

I-13 RED LIST has an updated list based on classes of chemicals, as a means to clarify the process for updating the Red List Chemical Abstract Services Registry Number list and avoid regrettable substitutions. The threshold for compliance has been set at 90%.

I-14 RESPONSIBLE SOURCING has an FSC project certification pathway and the calculation to determine the number of required Declare labels has been changed.

I-18 INCLUSION is a new Imperative addressing diversity in hiring and access to training. The Just label requirement has been changed and incorporated in this Imperative.

I-19 BIOPHILIC DESIGN includes most of the requirements of the LBC 3.1 Biophilic Environment Imperative integrated with the requirements from the LBC 3.1 Beauty + Spirit Imperative.

I-20 EDUCATION + INSPIRATION now requires one Living Future Accredited (LFA) professional on each project team.

2 https://living-future.org/education-lfa-2/
THE PAST DECADE HAS SEEN RELATIVELY SMALL PROGRESS TOWARD ADDRESSING GLOBAL CLIMATE CHANGE; WE ARE REACHING A POINT WHERE THE NEXT DECADE WILL SEE CHANGE TO OUR ECOSYSTEM HEALTH, FRESH WATER SUPPLIES AND CLIMATES AT UNPRECEDENTED LEVELS.

A world with seven billion people and counting.

A world where every single major ecological system is in decline, and the rate of that decline is increasing.

A world where global temperature increases means shifting rainfall distributions, acidified oceans and potentially catastrophic sea-level rise.

Nothing less than a sea change in building, infrastructure and community design is required. Indeed, this focus needs to be the great work of our generation. We must remake our cities, towns, neighborhoods, homes and offices, and all the spaces and infrastructure in between. This is part of the necessary process of reinventing our relationship with the natural world and each other—reestablishing ourselves as not separate from, but part of nature, “because the living environment is what really sustains us.”

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Since it was launched in 2006, the Living Building Challenge has inspired and motivated rapid and significant change: projects have sprouted up all over North America and beyond—currently, there are efforts underway in a dozen countries with several million square feet of Living Building Challenge projects in progress—each as a beacon in the dark showing what is possible; the regulatory environment has embraced a series of reforms; and most importantly, a new sense of possibility has permeated design communities as a result of the first 100+ certified projects.

Now that the Challenge has shown it is possible to achieve, the LBC 4.0 takes the lessons learned from the first 100+ certified projects and the first 500 registered projects and creates a scalable, simple and elegant certification program that can adequately address the radical change the built environment must make in the next decade.

**THIS STANDARD IS AN ACT OF OPTIMISM AND BELIEF THAT WITH THE RIGHT TOOLS IN THE HANDS OF PASSIONATE, LITERATE, AND SENSITIVE INDIVIDUALS, A REVOLUTIONARY TRANSFORMATION IS POSSIBLE. IT IS A PROGRAM THAT ASKS US TO THINK HOLISTICALLY AND TO ENGAGE BOTH OUR RIGHT AND LEFT BRAINS, HEAD AND HEART.**
We invite you to join us so that together we can continue to forge ahead on our path toward restoration and a Living Future.

The International Living Future Institute issues a challenge:

TO ALL DESIGN PROFESSIONALS, CONTRACTORS AND BUILDING OWNERS to transform the way we create the built environment radically and eliminate any negative impact on global health.

TO POLITICIANS AND GOVERNMENT OFFICIALS to remove barriers to systemic change, and to realign incentives to truly protect the health, safety and welfare of people and all beings.

TO ALL OF HUMANITY to reconcile the built environment with the natural environment, into a civilization that creates greater biodiversity, resilience and opportunities for life with each adaptation and development.
INSTEAD OF A WORLD THAT IS MERELY A LESS BAD VERSION OF THE ONE WE CURRENTLY HAVE—WE ASK A SIMPLE AND PROFOUND QUESTION—WHAT DOES GOOD LOOK LIKE?
THE LIVING BUILDING CHALLENGE IS A PHILOSOPHY, CERTIFICATION, AND ADVOCACY TOOL FOR PROJECTS TO MOVE BEYOND MERELY BEING LESS BAD AND TO BECOME TRULY REGENERATIVE.

NEGATIVE ENVIRONMENTAL IMPACTS

POSITIVE ENVIRONMENTAL IMPACTS

LIVING BUILDING CHALLENGE

CODE
GREEN
HIGH PERFORMANCE
SUSTAINABLE
Proven holistic performance rather than anticipated outcomes

TWO PRINCIPLES OF THE LIVING BUILDING CHALLENGE:

Living Building Challenge compliance is based on actual, rather than modeled or anticipated, performance. Therefore, projects must be operational for at least twelve consecutive months prior to audit to verify Imperative compliance.

All Living Building Challenge projects must be holistic—addressing aspects of all seven Petals through the Core Imperatives.
The Living Building Challenge consists of seven performance categories, or “Petals”: Place, Water, Energy, Health + Happiness, Materials, Equity and Beauty.

Each Petal is subdivided into Imperatives, for a total of twenty Imperatives in the Challenge. The Imperatives can be applied to almost every conceivable building project, of any scale and any location—be it a new building or an existing structure.

Many of the Imperatives have temporary exceptions to acknowledge current market limitations. These are listed in the Petal Handbooks, which should be consulted for the most up-to-date rulings. Temporary exceptions will be modified or removed as the market changes. With this Standard, the Institute requires advocacy for essential improvements to the building industry.
The Living Building Challenge is versatile and can apply to any building project. These include but are not limited to:

Living Building Challenge projects come in all shapes and sizes and consist of both new construction and renovation projects—including historic preservation. If you can imagine it, then it can likely be a Living Building given the right application of strategies, technologies, and imagination. Requirements can vary based on project context and conditions, but the intent of the Imperatives remains the same, regardless of project type.
Currently there are projects pursuing certification in nearly every building type.

LIVING BUILDING CHALLENGE PROJECTS CAN BE BUILT IN ANY CLIMATE ZONE ANYWHERE IN THE WORLD—AS EVIDENCED BY THE UNIQUE ARRAY OF PROJECTS CURRENTLY UNDERWAY IN MANY COUNTRIES AROUND THE GLOBE.
CURRENT AS OF APRIL 2019: 563 REGISTERED PROJECTS IN 29 COUNTRIES.

The Living Building Challenge is versatile and applies to different project scopes, or Typologies. There are four Typologies, and teams must identify the one that aligns with the project’s scope to determine which Imperatives apply.

NEW BUILDING: This Typology is for any project that encompasses the construction of a new building.

EXISTING BUILDING: This Typology is for any project that alters either the envelope or the major systems of a building.

INTERIOR: This Typology is for any project that does not alter either the envelope or the major systems of a building.

LANDSCAPE OR INFRASTRUCTURE: This typology is for any project that does not include an enclosed structure as part of its primary program. Projects may be parks, roads, bridges, plazas, sports facilities, or trails.
The Living Building Challenge is composed of 20 Imperatives grouped into seven petals. Some Imperatives are not required for all Typologies.

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**CORE IMPERATIVE**

**SCALE JUMPING ALLOWED**

**HANDPRINTING IMPERATIVE**

**IMPERATIVE REQUIRED FOR TYPOLOGY**

**REQUIREMENT DEPENDENT ON SCOPE**

**NOT REQUIRED FOR TYPOLOGY**
Because the Challenge is performance-based, the guiding principles and performance metrics apply regardless of where in the world the project is located—what changes is the specific mix of strategies and technologies—leaving it up to the genius of the design team to choose the most appropriate design response.

To encourage appropriate development in specific settings, the Standard draws on the work of Duany Plater-Zyberk & Company, who created the New Urbanism Transect model for rural to urban categorization.4 The Transect is a powerful basis for planning and demonstrates that different types of standards befit different development realities.

The Living Transect, which is applied to all projects, is used to modify the requirements for and apply exceptions to a number of Imperatives in the Living Building Challenge. Living Transects are an adaptation of the original Transect concept; the primary modification has been a reclassification of Transect zones T3 and T4 to emphasize appropriate mixed-use densification rather than sprawl.5

The Challenge encourages the transition of suburban zones to grow into either new urban areas with greater density; or to create balanced, mixed-use villages that can support full lives with minimal car trips; or to be restructured as new rural zones for food production, habitat, and ecosystem services.

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4 www.transect.org
5 These are general descriptions. Refer to the v4.0 Place Petal Handbook for more information.
L1. NATURAL HABITAT PRESERVE:
This Transect is comprised of land that is set aside as a nature preserve or is defined as wildlands or sensitive ecological habitat. It may not be developed except in limited circumstances related to the preservation or interpretation of the landscape, as outlined in the Place Petal Handbook.

L2. RURAL ZONE:
This Transect is comprised primarily of land that is used for agriculture and food production-based development, as well as the outlying areas of small towns and villages.

L3. VILLAGE OR CAMPUS ZONE:
This Transect is comprised of relatively low-density mixed-use development found in rural villages and towns, and low-density neighborhoods outside of small cities, and may also include college or university campuses.

L4. GENERAL URBAN ZONE:
This Transect is comprised of light- to medium-density mixed-use development found in larger villages, small towns, or at the edge of larger cities.

L5. URBAN CENTER ZONE:
This Transect is comprised of a medium- to high-density mixed-use development found in small to mid-sized cities or in the first “ring” of a larger city.

L6. URBAN CORE ZONE:
This Transect is comprised of high-to very high-density mixed use development found in large cities and metropolises.