WATER PETAL HANDBOOK

AUGUST 2014

LIVING BUILDING CHALLENGE℠ 3.0

A Visionary Path to a Regenerative Future

INTERNATIONAL LIVING FUTURE INSTITUTE™

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LIVING FUTURE
INSTITUTE℠

THE INTERNATIONAL LIVING FUTURE INSTITUTE

The International Living Future Institute is a non-profit organization offering green building and infrastructure solutions at every scale—from small renovations to neighborhoods or whole cities. The mission of the Institute is to lead and support the transformation toward communities that are socially just, culturally rich and ecologically restorative. The Institute administers the Living Building Challenge the built environment's most rigorous and ambitious performance standard.

IMPERATIVE 05: NET POSITIVE WATER

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INTRODUCTION

The Living Building Challenge is a certification program, advocacy tool and philosophy defining the most advanced measure of sustainability in the built environment today. As a certification program, it addresses all buildings, at all scales and is an inclusive tool for transformative design. Whether the project is a single building, a renovation or a park, the Living Building Challenge provides a framework for design, construction and improving the symbiotic relationship between people and all aspects of the built environment.

This Handbook is one in a series of publications that is intended to serve as a resource for project teams pursuing the Living Building Challenge 3.0. Because the Living Building Challenge Standard (the Standard) is continuously informed by the work that project teams are doing on the ground, these Petal Handbooks have been developed to clarify and consolidate the rules *at a set point in time* to provide a unified reference for project teams.

The Dialogue (explained below) provides the platform for project teams to request exceptions, clarifications and definitions related to program requirements. The Handbooks consolidate relevant Dialogue posts and the footnotes from the Standard into one location, to provide a simplified and consistent set of rules for easy reference. The Handbooks define the requirements for each Petal *as of their date of issue*. Project teams are encouraged to routinely check the Dialogue for postings after the issue date of this handbook in order to remain up to date on the program.

Any Dialogue ruling made after the date of this Handbook takes precedent over the information contained here. As a result, Handbooks will be updated on an as-needed basis to incorporate new Dialogue posts and to add more detailed information over time, but responsibility still rests with the project teams to be up to date on rulings that could affect their certification.

HOW TO USE THIS HANDBOOK

This Handbook describes the rule set or “body of law” for achieving all Imperatives that make up the Place Petal within the Living Building Challenge. It should be used in conjunction with the Living Building Challenge Standard 3.0. These rules apply to projects registered under 3.0 and not yet in Construction Documents by the publication date of this Handbook. Projects already in Construction Documents may apply these rules at their discretion.

ICONS

Net Zero icons identify Imperatives where partial or full compliance is required for Net Zero Energy Building (NZEB) Certification. The icons also identify which documentation is required and other information that is particularly relevant to NZEB projects.

Transect icons identify information relevant to a particular transect.

Scale Jumping icons identify either where Scale Jumping is permissible for each Imperative, or information that is particularly relevant to Scale Jumping.

Typology icons identify information relevant to a particular typology.

BUILDING	✓
RENOVATION	✓
LANDSCAPE + INFRASTRUCTURE	✓

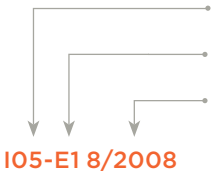
Typology tables identify which typologies are required to meet each Imperative. Where a typology is not checked within the table, projects within that typology are exempt from the Imperative.

CLARIFICATIONS AND EXCEPTIONS

This Handbook contains both Clarifications and Exceptions that consolidate Dialogue posts and the footnotes from the Standard to provide a simplified and consistent set of rules for easy reference.

Exceptions reflect current regulatory barriers or market realities and are therefore temporary. Exceptions will be phased out over time as regulations are updated and new technologies or materials become available.

Each Exception listed in the Petal Handbook is identified with a unique number. Project teams must reference the appropriate Exception numbers when submitting Dialogue posts and documentation for audit.



ADDITIONAL TOOLS AND SUPPORT

For project teams seeking further guidance, the International Living Future Institute offers several avenues for additional support:


Declare.

Your Product
Your Company

Final Assembly: City, State, Country
Life Expectancy: 000 Years
End of Life Options: Recyclable (42%), Landfill

Ingredients:

Your First Ingredient (Locally Sourced Location, ST), **Sustainably Sourced Ingredient** (Location, ST), **Non-toxic Item** (Location, ST), **Living Building Challenge Red List***, **Another Componant**, **US EPA Chemical of Concern**, **Last Ingredient**

Living Building Challenge Criteria:

XXX-0000 EXP. 11/11/2011
VOC Content: 0.00 mg/m³ VOC Emissions: CDPH Compliant
Declaration Status
☐ LBC Red List Free
■ LBC Compliant
☐ Declared

INTERNATIONAL **LIVING FUTURE** INSTITUTE™ declareproducts.com


Just.

Organization Name:
Organization Type:
Headquarters:
Satellite Facilities:
Number of Employees:

Social Justice and Equity Indicators:

Diversity
☐☐☐ Non-Discrimination
☐☐☐ Gender Diversity
☐☐☐ Ethnic Diversity

Equity
☐☐☐ Full Time Employment
☐☐☐ Pay-Scale Equity
☐☐☐ Union Friendly
☐☐☐ Living Wage
☐☐☐ Gender Pay Equity
☐☐☐ Family Friendly

Safety
☐☐☐ Occupational Safety
☐☐☐ Hazardous Chemicals

Worker Benefit
☐☐☐ Worker Happiness
☐☐☐ Employee Health Care
☐☐☐ Continuing Education

Local Benefit
☐☐☐ Local Control
☐☐☐ Local Sourcing

Stewardship
☐☐☐ Responsible Investing
☐☐☐ Community Volunteering
☐☐☐ Positive Products
☐☐☐ Charitable Giving
☐☐☐ Animal Welfare
☐☐☐ Transparency

THE SOCIAL JUSTICE LABEL
SPC-001 EXP. 10/26/2014

INTERNATIONAL **LIVING FUTURE** INSTITUTE™ justorganizations.com

Technical Assistance is offered by the Institute to support a project team's process of adopting the principles of the Challenge. Optional technical services include charrette facilitation, design development guidance and workshops, all of which are designed to provide input at a point in a project when changes are still possible.
living-future.org/lbc/support

The **Dialogue** is an online host for the transparent exchange of ideas between project teams and the Institute. It is the official venue to request feedback on proposed strategies for meeting the requirements of the Living Building Challenge. Only active, registered project teams can submit requests to the Dialogue.

Declare™ is a "nutrition label" and online database for building materials, providing manufacturers with a clear, elegant and informative pathway for disclosing the ingredients within their products. Project teams are encouraged to select products through Declare to ensure they meet Living Building Challenge materials requirements. If a suitable product cannot be found in Declare, project teams can streamline the process of materials research, selection, and documentation by requesting that a manufacturer list their products in Declare.
declareproducts.com

Just™ is an innovative social justice label for all types and sizes of organizations. The program provides an innovative transparency platform for organizations to reveal much about their operations, including how they treat their employees and where they make financial and community investments. Please see Imperative 18 for Living Building Challenge 3.0 requirements pertaining to the JUST program.
justorganizations.com

WATER

NET POSITIVE WATER

IMPERATIVE

05

BUILDING	✓
RENOVATION	✓
LANDSCAPE + INFRASTRUCTURE	✓

NETZERO ENERGY BUILDING CERTIFICATION™

SCALE JUMPING PERMITTED

INTENT

To meet all water demands within the carrying capacity of the site and mimic natural hydrological conditions, using appropriately-sized and climate-specific water management systems that treat, infiltrate or reuse all water resources on-site.

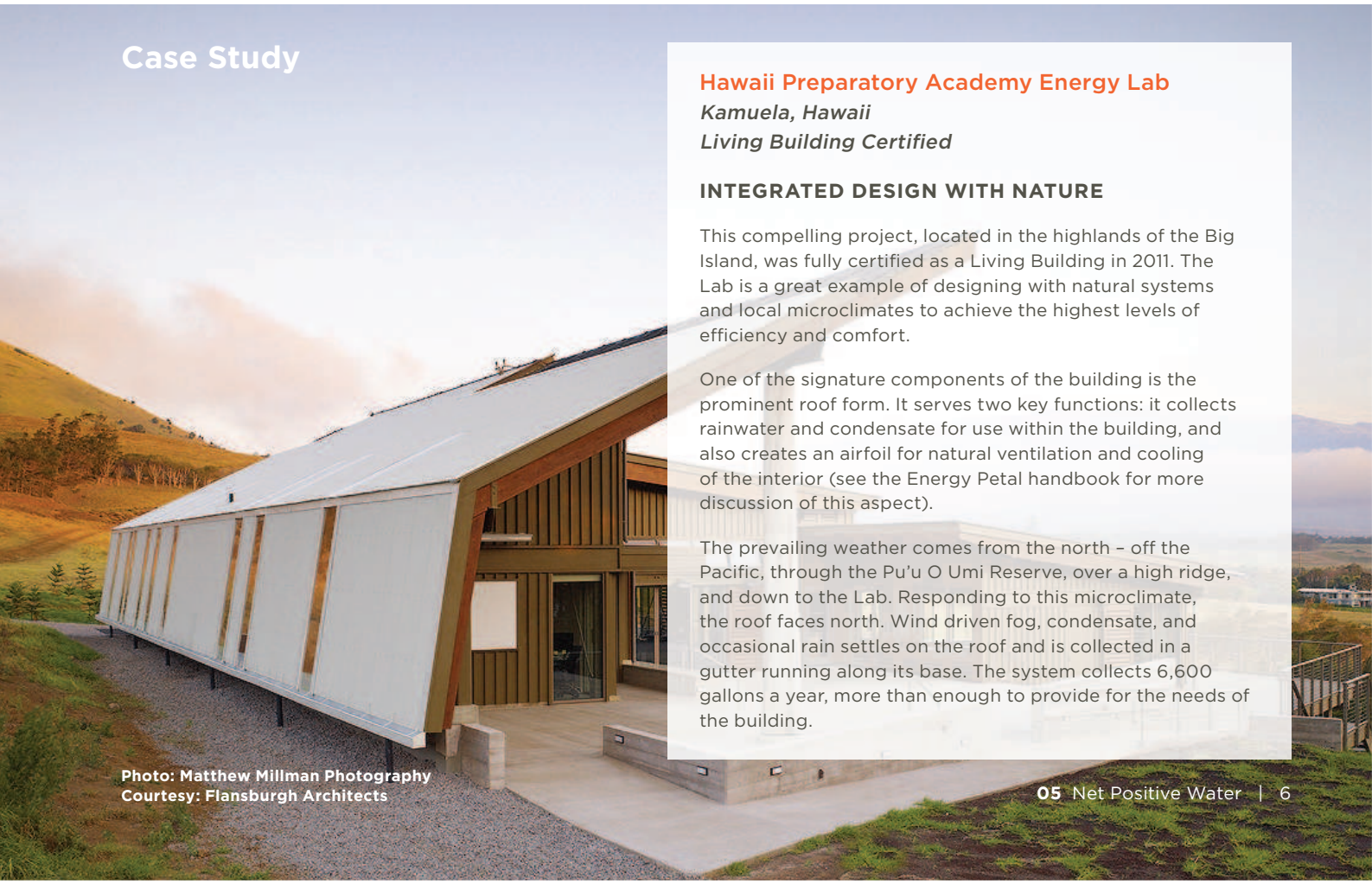
REQUIREMENT

Project water use and release must work in harmony with the natural water flows of the site and its surroundings. One hundred percent of the project's water needs must be supplied by captured precipitation or other natural closed loop water systems, and/or by recycling used project water, and must be purified as needed without the use of chemicals.

All stormwater and water discharge, including grey and black water, must be treated onsite and managed either through reuse, a closed loop system, or infiltration. Excess stormwater can be released onto adjacent sites under certain conditions.

CHANGES IN 3.0

Imperative 05 Net Zero Water and Imperative 06 Ecological Water Flow have been combined into one Imperative.



Case Study

Hawaii Preparatory Academy Energy Lab

Kamuela, Hawaii
Living Building Certified

INTEGRATED DESIGN WITH NATURE

This compelling project, located in the highlands of the Big Island, was fully certified as a Living Building in 2011. The Lab is a great example of designing with natural systems and local microclimates to achieve the highest levels of efficiency and comfort.

One of the signature components of the building is the prominent roof form. It serves two key functions: it collects rainwater and condensate for use within the building, and also creates an airfoil for natural ventilation and cooling of the interior (see the Energy Petal handbook for more discussion of this aspect).

The prevailing weather comes from the north – off the Pacific, through the Pu'u O Umi Reserve, over a high ridge, and down to the Lab. Responding to this microclimate, the roof faces north. Wind driven fog, condensate, and occasional rain settles on the roof and is collected in a gutter running along its base. The system collects 6,600 gallons a year, more than enough to provide for the needs of the building.

Photo: Matthew Millman Photography
Courtesy: Flansburgh Architects

CLARIFICATIONS

ACCEPTABLE WATER SOURCES

Acceptable sources of water supply for potable and non-potable needs include harvested rainwater, on-site groundwater, condensate from the air, surface water sources such as ponds, recycled process water, and grey and black water collected on site and treated appropriately for reuse.

Reclaimed water from large-scale public treatment facilities is not allowed. Lack of carrying capacity of a project site to supply enough water to the project is not an acceptable reason to use a municipal water supply.

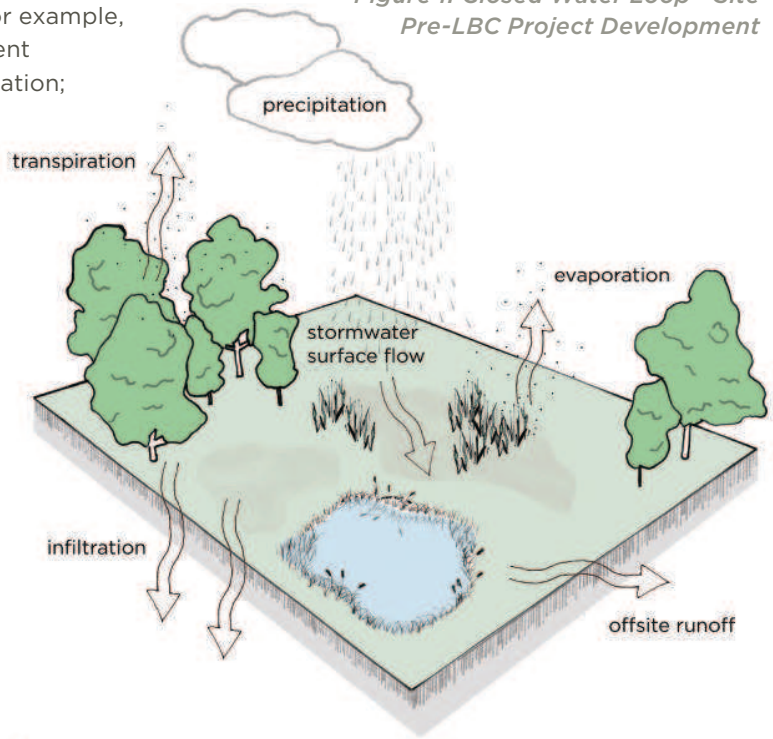
WORKING IN HARMONY WITH NATURAL WATER FLOWS

Project teams must research the current functions and capacity of natural water sources, and ensure that the project as developed emulates the natural hydrologic state of the site.

Carrying Capacity

Project water needs must be met within the carrying capacity of the site's natural water systems. For example, if the supply is rainwater, there must be sufficient opportunities for evapotranspiration and infiltration; if the supply is groundwater, there must be sufficient opportunities to recharge the aquifer. Where water is returned to the aquifer after use, it must be reintroduced so that it does not compromise natural systems (e.g., appropriately treated and reintroduced at an undamaging temperature, etc.).

Figure 1. Closed Water Loop - Site Pre-LBC Project Development



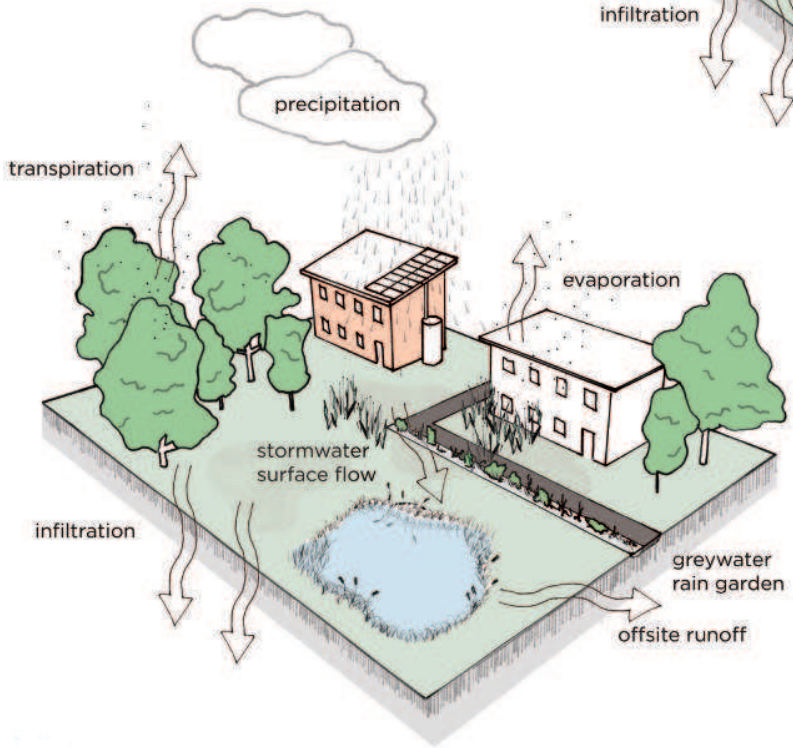
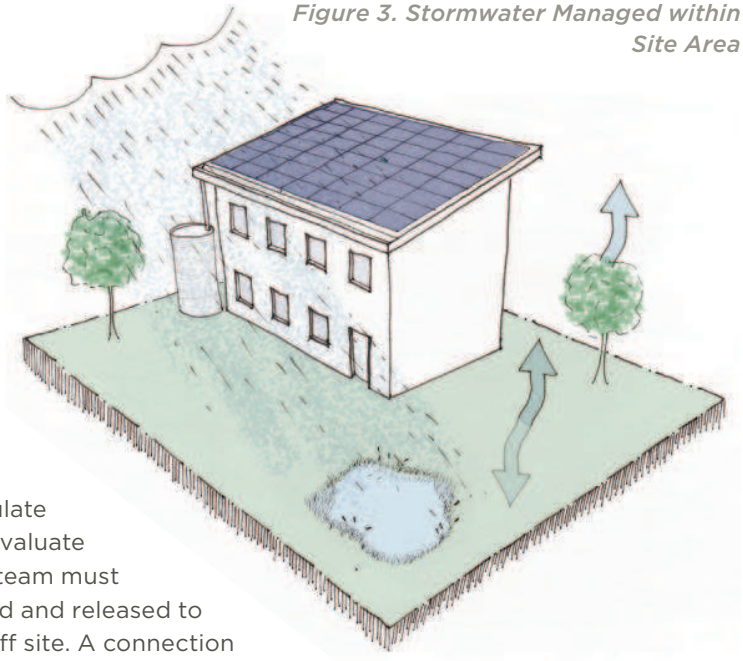


Figure 2. Closed Water Loop - Site Post-LBC Project Development

Stormwater

All stormwater must be appropriately treated, and systems must be designed to emulate the natural state of the site before development occurred. Stormwater that is not otherwise used by the project must be infiltrated within the Project Area, unless the natural state of the site is such that surface flows leave the site during rain events through sheet flow, drainage swales, streams, etc. To determine this, project teams must investigate pre-development site conditions such as slopes, soil types, and vegetation to determine historical flow patterns.

Figure 3. Stormwater Managed within Site Area

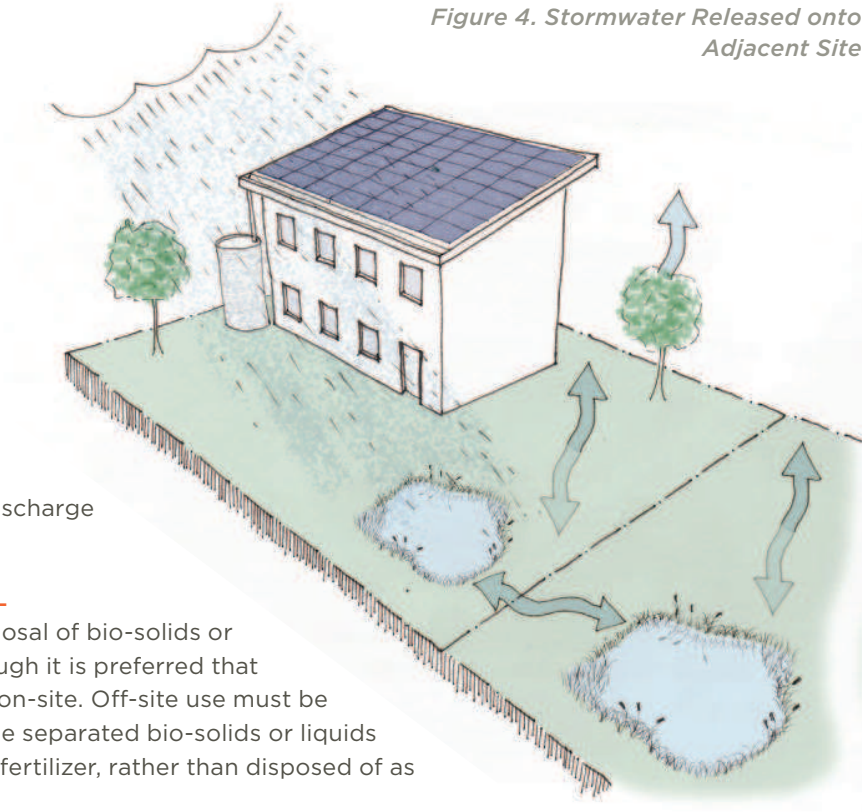


Teams should use a 10-year storm event to calculate the appropriate size of infiltration systems and evaluate pre-development off-site flows. In addition, the team must demonstrate that the runoff is sufficiently treated and released to maintain the quality of natural habitats on and off site. A connection to a storm sewer or combined sanitary/storm sewer is not permitted.

GREY WATER AND BLACK WATER

All grey water and black water must be treated and managed on site. There are numerous technologies readily available for on-site treatment such as composting toilets, trickling bio-filters, membrane bioreactors, constructed wetlands and treatment lagoons. In addition, a conventional septic system is an acceptable on-site strategy, and in some cases may be sufficient to accept all grey and black water discharge. An operational connection to the municipal sanitary sewer for grey water or black water discharge is not permitted.

Figure 4. Stormwater Released onto Adjacent Site



BIO-SOLIDS AND LIQUIDS DISPOSAL

The periodic removal and off-site disposal of bio-solids or liquids (separated) is permissible, though it is preferred that these valuable nutrients be managed on-site. Off-site use must be within 100 miles of the project site. The separated bio-solids or liquids must be used beneficially, such as for fertilizer, rather than disposed of as waste.

INITIAL WATER PURCHASE

An initial water purchase of non-project-sourced water to fill cisterns is allowed at the beginning of project occupancy.

TREATMENT OF WATER SUPPLY

Water supply for the building, including recycled water, must be treated appropriately for its intended use without the use of harmful chemicals. Chlorine (Cl_2), calcium hypochlorite (CaOCl2) and sodium hypochlorite (NaOCl) for water purification are prohibited in Living Buildings. These are all deemed to be possible carcinogenic, mutagenic, reprotoxic, or respiratory toxins by the US EPA and/or European Commission agencies.

Calcite (CaCO3), soda ash (Na2CO3), or caustic soda (NaOH) are acceptable additives to rainwater harvesting systems for pH buffering, to prevent corrosion of metal piping materials and fixtures.

Ultraviolet disinfection (UV) is allowed. It should be noted, however, that UV disinfection lamps typically contain mercury, an item on the Materials Red List.

WATER SYSTEMS AND THE RED LIST

A number of common water system materials, such as piping, roofing, and UV disinfection lamps contain materials that are on the Living Building Challenge Red List. In some cases there are temporary exceptions to allow the use of these materials when code or market limitations demand. Teams should see the Materials Petal Handbook for further information.

Piping Materials

Polyvinyl chloride (PVC) piping is commonly used for building water systems and is prohibited in Living Building Challenge projects except where required by code. There are a wide range of alternative products that can be used in lieu of PVC piping such as HDPE, polypropylene, PEX (polyethylene), vitrified clay, concrete, ABS, copper, steel, and iron.

METERING

The project must demonstrate, at the time of certification, that it has met the 100% site-sourced water requirement for a continuous 12-month occupancy period. Adequate water metering/tracking systems are required to show compliance. At a minimum, monthly readings must be recorded documenting actual water use (gal/month) from each applicable supply source:

- Harvested rainwater
- Groundwater or surface water
- Condensate
- On-site reclaimed grey water and black water
- Utility-provided municipal water (when allowed by Exception)

Sub-metering by end use, such as for sinks, showers, mechanical systems, etc., is not required, but is good practice for troubleshooting any issues with a project's water balance.

TEMPORARY IRRIGATION

It is acceptable to use municipal water supply for temporary irrigation to establish plants before the 12-month performance period has begun. It is not acceptable to use public utility water to irrigate the plants after the twelve-month performance period has started.

EQUIPMENT FAILURE

In an instance of equipment failure, the 12-month performance period to demonstrate compliance with this Imperative does not need to be reset. The performance period may be stopped and restarted once the equipment is functioning properly.

EXCEPTIONS

All Exceptions require additional documentation. *See I-05 Exception Documentation Summary Table.*

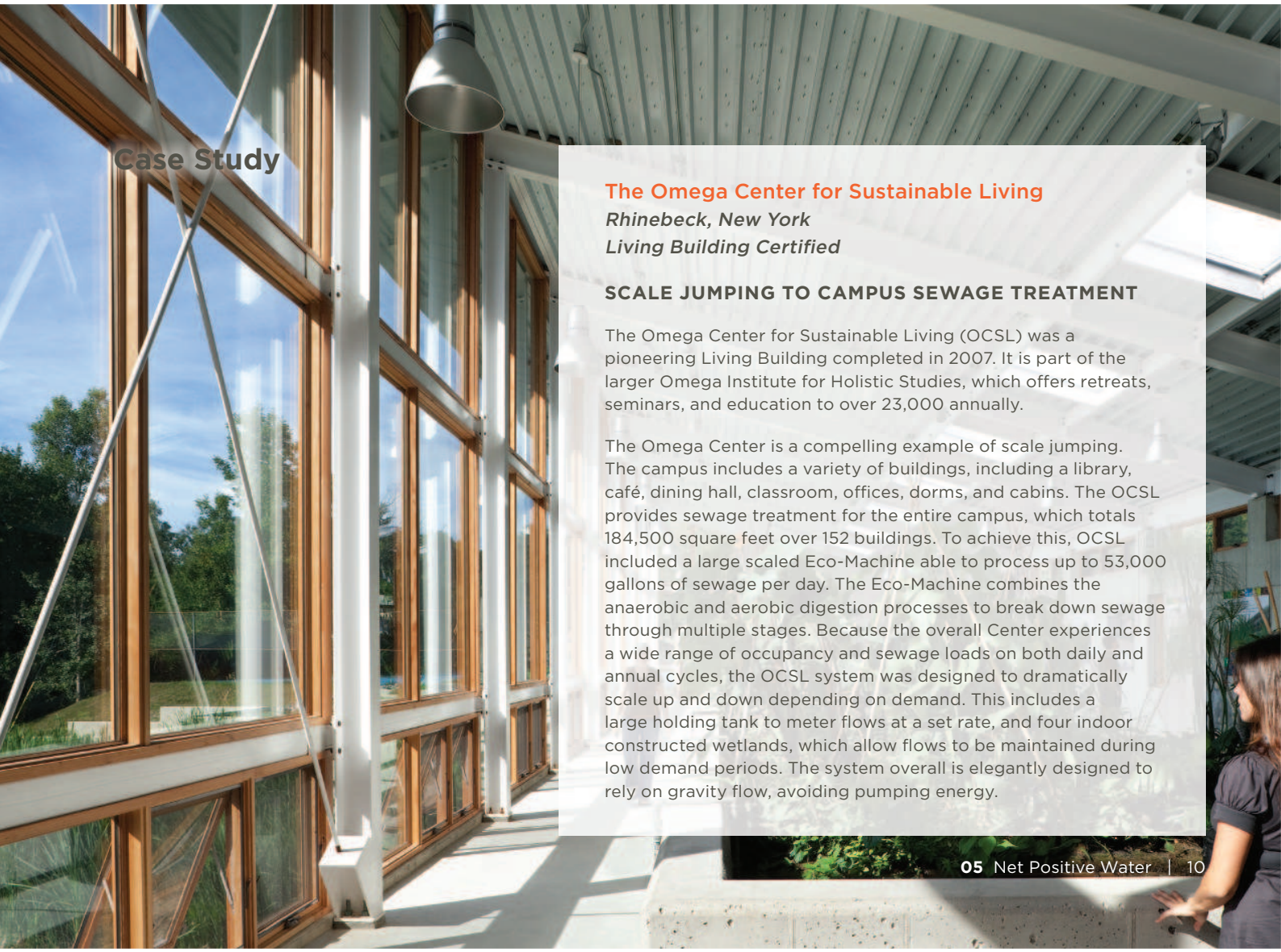
I05-E1 4/2010 Municipal Potable Water Supply

If health or utility regulations require a project to use municipal potable sources, it is allowed, but only for potable uses including sinks, faucets, janitorial uses, and showers. Non-potable uses such as toilet flushing, clothes washing, and equipment uses must use water sourced from the project site. While it is not required, the project is encouraged to include full rainwater harvesting capacity in anticipation of future regulatory acceptance of additional rainwater use.

To use this Exception the project team must exhaust all regulatory appeals short of legal appeals. In addition, the team must demonstrate through design drawings and calculations how the project is designed to meet the requirement for 100% site-sourced water.

I05-E2 11/2012 Municipal Water for Fire Protection

A connection to a municipal water supply is allowed for fire protection systems, as long as the connection is dedicated only for fire protection, and does not supply water for any other uses.



Case Study

The Omega Center for Sustainable Living

Rhinebeck, New York
Living Building Certified

SCALE JUMPING TO CAMPUS SEWAGE TREATMENT

The Omega Center for Sustainable Living (OCSL) was a pioneering Living Building completed in 2007. It is part of the larger Omega Institute for Holistic Studies, which offers retreats, seminars, and education to over 23,000 annually.

The Omega Center is a compelling example of scale jumping. The campus includes a variety of buildings, including a library, café, dining hall, classroom, offices, dorms, and cabins. The OCSL provides sewage treatment for the entire campus, which totals 184,500 square feet over 152 buildings. To achieve this, OCSL included a large scaled Eco-Machine able to process up to 53,000 gallons of sewage per day. The Eco-Machine combines the anaerobic and aerobic digestion processes to break down sewage through multiple stages. Because the overall Center experiences a wide range of occupancy and sewage loads on both daily and annual cycles, the OCSL system was designed to dramatically scale up and down depending on demand. This includes a large holding tank to meter flows at a set rate, and four indoor constructed wetlands, which allow flows to be maintained during low demand periods. The system overall is elegantly designed to rely on gravity flow, avoiding pumping energy.

I05-E3 7/2009 Chlorine Disinfection

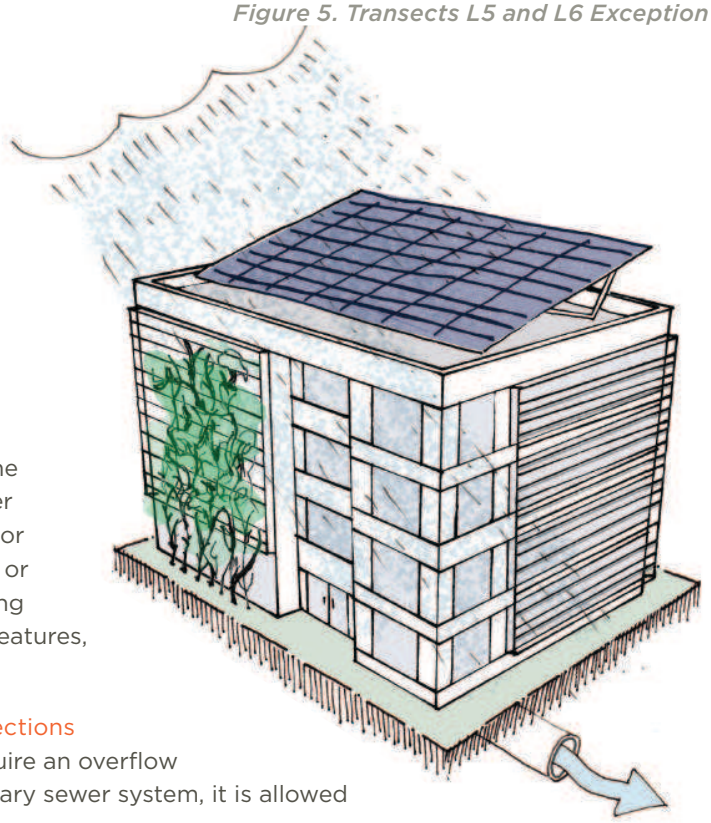
Chlorine disinfection for potable water uses on projects regulated as "public water systems" under the U.S. Safe Drinking Water Act (or equivalent regulations outside of the US) is allowed. The US EPA defines public water systems as those that have at least 15 service connections, or regularly serve at least 25 individuals. For these projects, chlorine disinfection may be required for regulatory compliance. However, to use this Exception, the project must exhaust all regulatory appeals short of legal appeals. The chlorine added should be the minimum amount allowed by the code. In addition, the project must include and document point-of-use dechlorination with a 0.5 micron carbon block filter or other approved dechlorination method.

I05-E4 4/2010 Transects L5 and L6 - Municipal Stormwater Connection

For Building projects in Transects L5 or L6, and where there is no adjacent downstream habitat supported by the water from this site, there is a conditional exception allowing the use of public storm sewers. In this instance, the project team may propose managing less than 100% of water on site by demonstrating that all possible pathways of beneficial use of the stormwater have been exhausted, including:

- Evaporation/Evapotranspiration: Show that all areas for water uptake by plants or other means have been fully utilized (i.e. living walls, green roof, on-site or off-site vegetation, cooling tower make-up, irrigation for urban agriculture, etc.).
- Infiltration: Show that both shallow and deep infiltration have been investigated and utilized to the greatest extent possible.
- Beneficial Reuse: Show that no additional beneficial reuse of the stormwater is possible for either potable or non-potable use on or off the project site (i.e. potable or non-potable uses on neighboring buildings or properties, water features, etc.).

Figure 5. Transects L5 and L6 Exception



I05-E5 9/2008 Municipal Sewer Overflow Connections

If health or utility regulations require an overflow connection to the municipal sanitary sewer system, it is allowed if the team:

- Exhausts all regulatory appeals short of legal appeals
- Installs a manual valve control that is designed to remain closed
- Provides a signed statement that the overflow connection was not used during the performance period

SCALE JUMPING

This Imperative may be attempted using the Scale Jumping design overlay.

PROJECT AREA

Areas used for Scale Jumping are not included in, and do not affect, the Project Area or FAR. If a project jumps to an area within its own property that is not shared with other projects, it is not Scale Jumping and the additional land needs to be included in the Project Area.

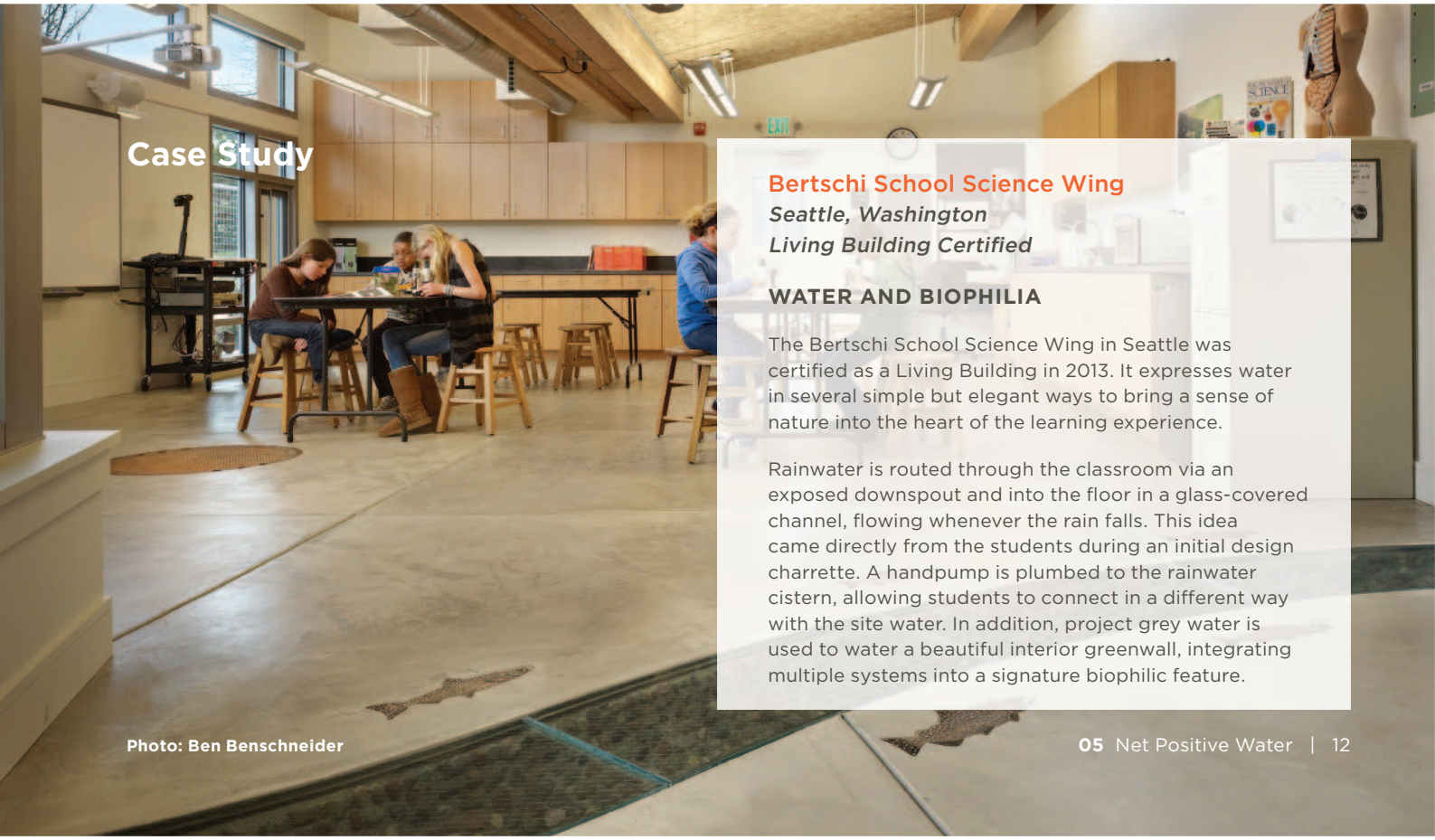
OTHER IMPERATIVES

When Scale Jumping is implemented, all new components installed for the Challenge project (e.g., storage cisterns, water treatment systems, pipes and pumps) must meet the requirements of all Imperatives pursued by the project. If the project is Scale Jumping by tapping into an existing small-scaled water supply or management system that serves other buildings not pursuing the Living Building Challenge, only those components added to the existing system, such as conveyance pipes and pumps to supply water to the Challenge project, need to meet Challenge requirements.

For example, all pumping energy needed to convey the project's water must be included in the project's energy budget and taken into consideration for Imperative 06: Net Positive Energy. If the project is part of a larger scale system, only the apportioned energy serving the Living Building Challenge project needs to be included, and the project must install adequate sub-metering of energy to demonstrate compliance.

SMALL COMMUNITY SCALE

Scale Jumping to the "small community" scale may be defined by the geographic boundaries of a neighborhood or collection of neighborhoods within a city, or by the boundaries of a small, localized watershed. Tapping into a city or town's existing municipal water supply or wastewater system or a large-scale, centralized public facility does not qualify as Scale Jumping and is not allowed. Small-community-scale, distributed satellite facilities may qualify if they eliminate the need for lift stations or shorten conveyance pipes, and manage wastewater within a more localized watershed.



Bertschi School Science Wing
Seattle, Washington
Living Building Certified

WATER AND BIOPHILIA

The Bertschi School Science Wing in Seattle was certified as a Living Building in 2013. It expresses water in several simple but elegant ways to bring a sense of nature into the heart of the learning experience.

Rainwater is routed through the classroom via an exposed downspout and into the floor in a glass-covered channel, flowing whenever the rain falls. This idea came directly from the students during an initial design charrette. A handpump is plumbed to the rainwater cistern, allowing students to connect in a different way with the site water. In addition, project grey water is used to water a beautiful interior greenwall, integrating multiple systems into a signature biophilic feature.

Photo: Ben Benschneider

NET BENEFIT

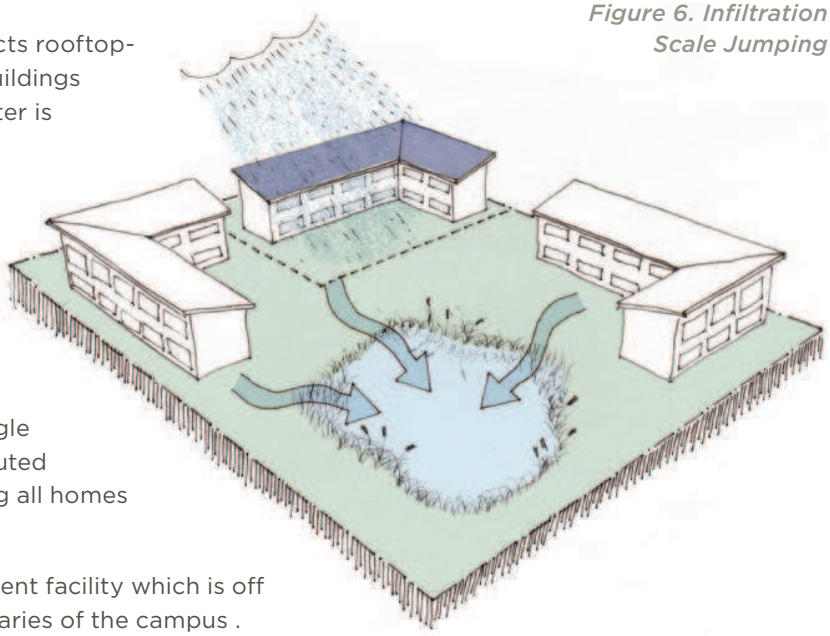
Scale Jumping must not be used to enlarge the water footprint of a project, but instead must result in a net benefit, including one or more of the following:

- Higher net efficiency
- Lower net cost
- Mutually beneficial water sharing with other projects
- Preservation of existing trees/habitat
- Creation of a larger infrastructure strategy

EXAMPLES OF SCALE JUMPING

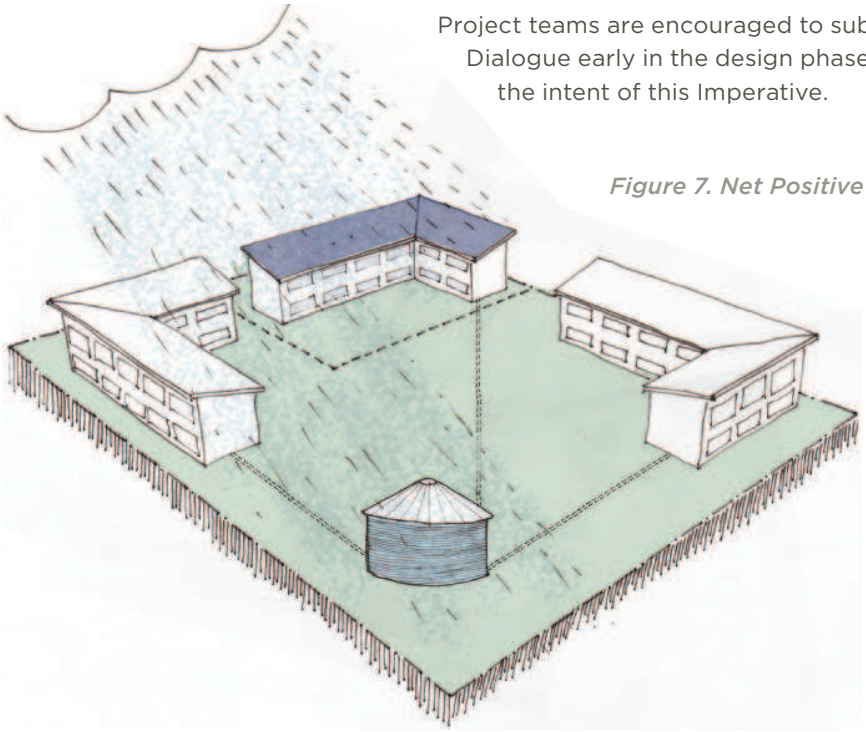
- A residential development that collects rooftop-harvested rainwater from multiple buildings into a common cistern where the water is then pumped back to each home for use.
- A project in a campus setting that taps into a surface water or groundwater source located off the project site but within the campus boundary.
- A residential development with a single constructed wetland or other distributed wastewater treatment system serving all homes within the neighborhood.
- A local-scale satellite campus treatment facility which is off the project site but within the boundaries of the campus .

Figure 6. Infiltration Scale Jumping



Project teams are encouraged to submit Scale Jumping concepts to the Dialogue early in the design phase, to confirm that the proposal meets the intent of this Imperative.

Figure 7. Net Positive Water Scale Jumping



DOCUMENTATION REQUIREMENTS

BASIC DOCUMENTATION

All projects require all Basic Documentation, unless noted otherwise.

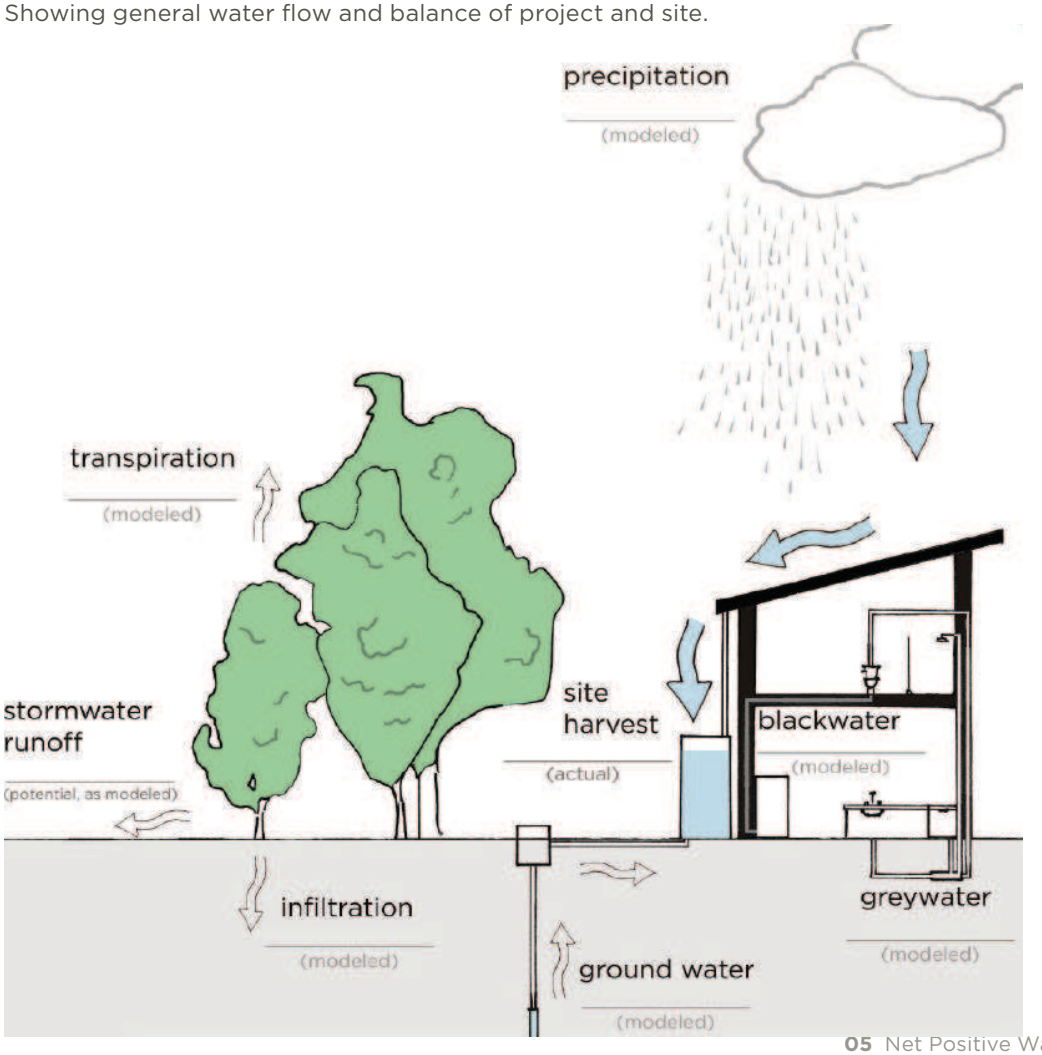
I05-1 Water Narrative

A narrative shall be provided, fully describing water system design and compliance with the Imperative. The narrative, written by the water engineer or designer, shall include the following:

- A summary of the site hydrology and project systems.
- A description of the pre and post development hydrology of the site, and how the project works in harmony with natural water flows.
- A detailed description of how 100% of project water needs are being met from on-site sources, including contributing system(s) and major components, their function and location, and the water treatment method(s).
- A detailed description of the stormwater, grey water and black water treatment and management system(s), their major components, and their function and location.

I05-2 Annual Water Balance Diagram

Showing general water flow and balance of project and site.



IO5-3 Water Supply and Use Table

Total actual water use from monthly readings throughout the 12-month occupancy period from meter(s) or other on-site tracking systems that clearly record the amount of water used from each applicable supply source.

Water Supply and Use Table

Living Building Challenge 3.0
Water Supply and Use Table

Project Name:

	Performance Month	1	2	3	4	5	6	7	8	9	10	11	12	
Performance Period	Actual Month & Year (fill in name/year)	*Month Year*	*Month Year*	*Month Year*	*Month Year*	*Month Year*	*Month Year*	*Month Year*	*Month Year*	*Month Year*	*Month Year*	*Month Year*	*Month Year*	Annual Total
	Water units (fill in)													
Water Supply	Harvested Rainwater													0
	Ground/Surfact Water													0
	Reclaimed Greywater													0
	Municipal Potable Water (if allowed by exception)													0
	Other (describe)													0
														0
	Total Actual Water Supply	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Use	Domestic water*													0
	Process water*													0
	Irrigation**													0
	Other (describe)													0
														0
	Total Actual Water Use	0	0	0	0	0	0	0	0	0	0	0	0	0
Modelled	Modelled water supply													0
	Modelled water use													0
	Predicted delta	0	0	0	0	0	0	0	0	0	0	0	0	0

* Break out & list by uses if known. If not, fill in total as "other (total)".

** For urban agriculture areas

IO5-4 Stormwater Calculations

Stormwater calculations by the project engineer demonstrating Imperative requirements for working in harmony with natural water flows, based on a minimum of a 10-year storm event.

IO5-5 Statement of Non-Connection to Utility

A signed statement, written by the owner, stating that the project is not connected to a municipal potable water supply or sanitary sewer.

IO5-6 Biosolids Disposal Documentation

Evidence of appropriate use of bio-solids and liquids within 100-mile radius of project.

IO5-7 Photographs

Photographs of the systems, particularly portions that will be hidden from view at time of audit due to completion of construction.

EXCEPTION DOCUMENTATION

Projects that use Exceptions or compliance paths that are not standard for all projects require additional documentation.

I-05 Exception Documentation Summary Table

EXCEPTION		I05-a Exception Narrative	I05-b Meter Data & Calculations	I05-c Design Docs	I05-d Appeal Docs
I05-E1	Municipal Potable Water Supply		x	x	x
I05-E2	Municipal Water for Fire Protection			x	
I05-E3	Chlorine Disinfection			x	x
I05-E4	L5 & L6 - Municipal Stormwater Connection	x	x		
I05-E5	Municipal Sewer Overflow Connection	x		x	x

I05-a Exception Narrative

Signed narrative statement making a clear case that the project is eligible for the Exception and how it has met requirements.

I05-b Meter Data & Calculations

Meter data and /or calculations as needed to show compliance with Exception requirements.

I05-c Design Documentation

Design documents, such as project manual excerpts, drawings or cutsheets, showing how the project meets Exception requirements.

I05-d Appeal Documentation

Documentation of the team's effort to comply with requirements despite regulatory barriers, including:

- The regulatory statute or code that hinders project compliance
- Summary of all potential appeals and outcomes
- Written appeal documents and response showing the decision(s) from regulatory authority.

We need a new water ethic that puts water at the centre of all policy and everything we do. We must always ask the question: what is the impact of this policy or practice on water? If it is negative, we much drop it or amend it accordingly. Water is not a resource for our convenience and profit but the essential element in a living ecosystem upon which we all depend.

Maude Barlow, Chairperson, Council of Canadians

DEFINITIONS

Closed-Loop Water Systems
Systems in which all water used on a project is captured, treated, used/reused and/or released within the boundaries of the Project Area.

Evapotranspiration
The sum of evaporation and plant transpiration from earth's surface into the atmosphere.

Municipal Potable Water
Water supplied by a city or town, or other large-scaled water systems operating at a similar scale to a municipal water system.

Non-potable Water
Water that is not safe for human consumption, but may be used for other purposes such as toilet flushing or clothes washing.

Potable Water
Water that is fit for human consumption.

Water Balance
A numerical account of how much water enters and leaves the boundaries of a project over a specified period.

Black water
Discharged water containing solid and liquid human wastes from toilets and urinals.

Grey water
Water discharged from sinks, showers, laundry, drinking fountains, etc., but not including water discharged from toilets and urinals.

Groundwater
Fresh water supply that is located beneath the surface of the ground and is typically of suitable quality for potable and non-potable uses.

Non-potable Water
Water that is not safe for human consumption, but may be used for other purposes such as toilet flushing and irrigation.

Potable Water
Water that is fit for human consumption.

Pre-development Hydrology
The combination of runoff, infiltration, and evapotranspiration rates and volumes that typically existed on a site before human-induced land disturbance occurred.

Post-development Hydrology
The combination of runoff, used project water,, infiltration, and evapotranspiration rates and volumes that exist on a site after development.

Reprotoxin
Substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may produce or increase the incidence of non-heritable adverse effects in the progeny and/or an impairment of male or female reproductive functions or capacity.

Stormwater
Precipitation that falls on the ground surfaces of a property.

RESOURCES

International Living Future Institute's Net Zero Water Research
Includes case studies, best management practices and guidance for removing regulatory barriers:
living-future.org/ilfi/research/research/water

International Living Future Institute's On-site Wastewater Treatment Research
Includes case studies, best management practices, lifecycle assessment of various systems and guidance for removing regulatory barriers.
living-future.org/ilfi/ideas-action/research/water

LIVING BUILDING CHALLENGE[SM] 3.0

A Visionary Path to a Regenerative Future

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