APPENDIX A: Living Building Challenge Performance Requirements for Specification Sections

*This document is part of the Living Building Challenge specification resources, including:*

* Living Building Challenge Specification Guidebook

*A narrative explanation of the specification writing process for LBC projects as well as instructions for using the other specification resource documents*

* Example Section 01 81 13, Sustainable Design Requirements

*An editable example of general LBC language*

* Example Section 01 74 19, Construction Waste Management

*An editable example of LBC language for Imperative 14 Net Positive Waste*

* Example Section 01 81 14, Construction Indoor Air Quality

*An editable example of the language for IAQ testing for compliance with Imperative 08 Healthy Interior Environment*

* Living Building Challenge Performance Requirements

*An editable example of language for inclusion in Division 03-50 to aid in compliance with a variety of Imperatives and corresponding Exceptions.*

*The following are sample materials performance requirements for inclusion in individual specification sections. Sample language is organized by published Living Building Challenge Exception and, includes exception language for many of the most frequently used Exceptions, as of the May 2017 Living Building Challenge 3.1 Petal Handbook release. Example section numbers are given for reference only; project teams should include in specification sections at their own discretion. Language and referenced sections may differ from one project to another.*

*Subsection number and formatting are presented as samples only. Project teams should modify outline placement and numbering of the black text to suit individual project needs and specification writer preferences, and requirements of the appropriate version of the Living Building Challenge being pursued by the project. Blue text is instructional, and is not to be copied.*

*Referenced LBC Exceptions reflect current market conditions at the time of Exception publication. All Exceptions are considered temporary and project teams should consult the current Petal Handbooks and Dialogue for additional Exception guidance.*

**Division 01 section 01 81 13, Sustainable Design Requirements**

*Recommended for inclusion in each section Division 03-50:*

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# 2.1 living building challenge performance requirements

##  All materials and equipment are to meet the requirements outlined in specification section 01 18 13, Sustainable Design Requirements. Products are to meet the written requirements for Living Building Challenge compliance including, but not limited to:

### Imperative 08, Healthy Indoor Environment

### Imperative 10, Red List

### Imperative 12, Living Economy Sourcing

### Imperative 13, Responsible Industry

*The following is a reference to the Imperative 08 Healthy Interior Environment emissions requirements. Language should be included in sections specifying interior materials with the potential to emit Volatile Organic Compounds per the California Department of Public Health Standard Method v1.1-2010.*

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## Interior building products that have the potential to emit Volatile Organic Compounds are required to comply with the California Department of Public Health (CDPH) Standard Method v1.1-2010, or international equivalent.

*The following are references to specific exceptions listed in the Living Building Challenge v3.1 Health and Happiness Petal Handbook. Language is organized by exception number and likely sections for inclusion are suggested when known.*

**Exception I08-E2 Salvaged Interior Building Products.**

*This exception may apply to interior salvaged products:*

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## Salvaged interior building products are not required to comply with CDPH Standard Method v1.1-2010. A list of salvaged products that would otherwise have required CDPH documentation must be provided.

**Exception I08-E3 CDPH Testing In Progress.**

*This exception may apply to interior products with incomplete testing:*

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## Products that have not completed testing to document compliant with CDPH Standard Method v1.1 may be installed provided the manufacturer has submitted the product to an approved testing facility and is in the process of verifying compliance with CDPH at the time of product purchase.

*The following are references to specific exceptions listed in the Living Building Challenge v3.1 Materials Petal Handbook. Language is organized by exception number. Teams must use due diligence to comply with the rules of the Standard, and only apply LBC exceptions if a compliant product is not available.*

**Exception I10-E2 Small Electrical Components.**

*This exception may apply to some items in the following Divisions and Sections:*

* *Division 23, HVAC*
* *Division 25, Integrated Automation*
* *Division 26, Electrical*
* *Division 28, Electronic Safety and Security*
* *Section 11 20 00, Commercial Equipment*
* *Section 11 30 00, Residential Equipment*
* *Section 22 30 00, Plumbing Equipment*

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## Complex electrical or data products that are made up entirely of small electrical components may meet the European Union’s Restriction of the Use of Certain Hazardous Substances (RoHS) Directive in lieu of full ingredient documentation.

## Products which include complex electrical or data components may document that the electrical components meet the European Union’s Restriction of the Use of Certain Hazardous Substances (RoHS) Directive in lieu of full ingredient documentation for electrical components; full ingredient disclosure must be provided for nonelectrical components.

**Exception I10-E3 Small Mechanical Components.**

*This exception may apply to the following Divisions and sections:*

* *Division 23, HVAC*
* *Section 11 20 00, Commercial Equipment*
* *Section 11 30 00, Residential Equipment*
* *Section 22 30 00, Plumbing Equipment*

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## Small components within complex mechanical equipment that make up less than 10% of the total assembly by weight and volume are not required to be tracked for Red List compliance.

### Mechanical equipment and components are defined as those subject to movement from an outside force, such as water pressure or electrical current.

**Exception I10-E6 Glass-Mat Gypsum Sheathing.**

*This exception may apply to the following Divisions and sections:*

* *Section 06 16 43, Gypsum Board Sheathing*

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## B. A small amount of formaldehyde is permitted in glass-mat gypsum sheathing.

**Exception I10-E7 Battery Systems**.

*This exception may apply to the following Divisions and sections:*

* *Section 26 33 00, Battery Equipment*
* *Section 48 14 00, Solar Energy Electrical Power Generation Equipment*

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## B. Some lead is allowed in solar battery systems.

**Exception I10-E8 Door Hardware**

*This exception may apply to the following Divisions and sections:*

* *Section 08 71 00, Door Hardware*

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## Some lead is allowed in door hardware.

**Exception I10-E9 Phenol Formaldehyde in Mineral Wool Insulation.**

*This exception may apply to the following Divisions and sections:*

* *Section 07 21 13, Thermal Insulation, Board Insulation*

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## B. Phenol formaldehyde is allowed in exterior rigid mineral wool insulation applications.

**Reference to Exception I10-E10 Structural Composite Wood Members.**

*This exception may apply to the following Divisions and sections:*

* *Section 06 11 13, Wood Framing, Engineered Wood Products*
* *Section 06 17 00, Shop Fabricated Structural Wood*
* *Section 06 18 00, Glued-Laminated Construction*

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## B. Added phenol formaldehyde is allowed in composite structural members.

**Reference to Exception I10-E11 Composite Wood Sheet Goods.**

*This exception may apply to the following Divisions and sections:*

* *Section 06 15 00, Wood Decking*
* *Section 06 16 00, Sheathing*

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## Added phenol formaldehyde is allowed in structural composite wood sheet goods.

**Exception I10-E11 Composite Wood Sheet Goods.**

*This exception may apply to the following Divisions and sections:*

* *Section 12 59 00, Systems Furniture*

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## Systems furniture substrates may contain added formaldehyde when in compliance with the Ultra-Low-Emitting-Formaldehyde (ULEF) designation by CARB Phase II emission thresholds.

**Exception I10-E11 Composite Wood Sheet Goods.**

*This exception may apply to the following Divisions and sections:*

* *Section 08 14 13, Stile and Rail Wood Doors*

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## Added formaldehyde is allowed in door rail joints.

**Exception I10-E11 Composite Wood Sheet Goods.**

*This exception may apply to the following Divisions and sections:*

* *Section 08 14 16, Flush Wood Doors*

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## Flush wood doors may contain no more than 2% added phenol or melamine formaldehyde.

**Exception I10-E12 HFRs in Foam Insulation.**

*This exception may apply to some foam insulation products in the following Divisions and sections:*

* *Section 06 12 00, Structural Panels*
* *Section 07 21 13, Board Insulation*
* *Section 07 21 19, Foamed-In-Place Insulation*
* *Section 07 24 00, Exterior Insulation and Finish Systems*
* *Section 08 13 13, Hollow Metal Doors*

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## Foam insulation may contain Halogenated Flame Retardants.

**Exception I10-E13 Mercury in UV Disinfection Lamps.**

*This exception may apply to the following Divisions and sections:*

* *Section 33 13 00, Disinfecting of Water Utility Distribution*

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## UV filtration lamps may contain mercury.

**Exception I10-E16 HFRs in Non-PVC Wiring.**

*This exception may apply to the following Divisions and sections:*

* *Division 26, Electrical*

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## Halogenated Flame Retardants (HFRs) are permitted in non-PVC electrical wiring.

##  1. Exception does not apply to data cable applications. Data cable must be HFR and PVC free.

**Exception I10-E17 Plumbing.**

*This exception may apply to the following Divisions and sections:*

* *Section 22 41 16, Residential Lavatories and Sinks*
* *Section 22 41 23, Residential Showers*
* *Section 22 42 16, Commercial Lavatories and Sinks*
* *Section 22 42 23, Commercial Showers*
* *Section 22 43 23, Healthcare Showers*
* *Section 22 43 39, Healthcare Faucets*
* *Section 22 47 00, Drinking Fountains and Water Coolers*

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## B. Plumbing fixtures in direct contact with potable water for human consumption may contain low levels of lead provided they meet the definition of “Lead Free” as defined in S. 3874: Reduction of Lead in Drinking Water Act, effective January 1, 2014.

**Exception I10-E18 Commercial Water Systems.**

*This exception may apply to the following Divisions and sections:*

* *Section 22 13 00, Facility Sanitary Sewerage*
* *Section 22 14 00, Facility Storm Drainage*
* *Section 23 20 00, HVAC Piping and Pumps*
* *Section 32 80 00, Irrigation*

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## B. Commercial water systems that do not require a potable water connection may contain some added lead.

**Exception I10-E21 Chrome VI in Plumbing Flush Fixtures.**

*This exception may apply to the following Divisions and sections:*

* *Section 22 41 13, Residential Water Closets, Urinals, and Bidets*
* *Section 22 42 43, Flushometers*
* *Section 22 43 43, Healthcare Plumbing Fixture Flushometers*

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## B. Plumbing fixture flush levers and flush valves may contain Chromium VI in the fixture plating.

**Exception I10-E22 Formaldehyde in Systems Furniture Laminate.**

*This exception may apply to the following Divisions and sections:*

* *Section 12 59 00, Systems Furniture*

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## Systems furniture surfaces may contain a small amount of formaldehyde in the laminate binder and adhesive. Manufacturers must demonstrate through emissions testing that formaldehyde emissions from the finished product are below that allowed by CDPH Standard Method v1.1-2010 or international equivalent.

**Exception I10-E23 Phenol Formaldehyde Polymers in Foam Board Insulation.**

*This exception may apply to the following Divisions and sections:*

* *Section 07 21 13, Board Insulation*
* *Section 07 24 00, Exterior Insulation and Finish Systems*

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## Foam board insulations containing phenol formaldehyde polymers may be used if, as specified in the California Air Resources Board (CARB) Regulation:

## the phenol formaldehyde polymer in the insulation contains acceptable levels of free/residual formaldehyde, and

## the phenolic foam boards' bonds are between formaldehyde and phenol, resorcinol, cresols, or a mixture thereof.

## To demonstrate compliant levels of free/residual formaldehyde, the manufacturer or supplier must:

## conduct testing of the polymer in accordance with ISO 11402 (Formaldehyde content) or EN 717 (Formaldehyde emissions) or an equivalent standard, and

## document that test results were below the CARB formaldehyde limits (content or emissions).

## This exception does not apply to polymeric materials with urea-formaldehyde or urea-melamine or mixtures of these materials with phenol formaldehyde.

**Exception I12-E25 Lead Products in Medical Facilities**

*This exception may apply to Divisions and sections related to medical equipment on construction specialties.*

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B. When required for protection from internal radiation sources such as X-ray and MRI machines, hospital doors and other building products in medical facilities may contain lead. Non-protective doors and building products may not contain lead.

**Exception I12-E01 Intentional Harvest.**

*This exception may apply to Divisions and sections specifying wood containing products:*

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## On-site timber harvest is allowed, in lieu of FSC Chain of Custody, if the project team can demonstrate that the tree removal was required for project construction or as part of a reforestation or restoration program.

### Documentation of minimally invasive harvesting practices must be submitted.

### A narrative and/or photo explanation must be submitted documenting why tree removal was required for construction or restoration efforts with details of the harvest and milling process to create the finished goods.

**Exception I12-E02 Pending Forest Stewardship Council (FSC) Certification.**

*This exception may apply to Divisions and sections specifying wood containing products.*

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## Wood from entities with pending FSC Certification is acceptable if the timber is processed, harvested or milled, after the FSC Certification audit is complete.

### Final Certification of the mill or forest may be in progress.

**Exception I12-E03 Invasive Species.**

*This exception may apply to Divisions and sections specifying wood containing products.*

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## Wood that does not carry a third party certification, but was sourced from either trees infested with invasive species or trees that are an invasive species and need to be removed for the health of the forest may be installed. All invasive species require written approval from the International Living Future Institute.

### Pine Beetle Wood from British Columbia, CA has been approved by the Institute for use.

### Western Juniper from Oregon, USA has been approved by the Institute for use.

### Black Locust from states where the species has been identified by a federal or state environmental agency as invasive has been approved by the Institute for use.