

SECTION 01 81 13.03**SUSTAINABILITY CERTIFICATION REQUIREMENTS - LEED V4 BD+C: HEALTHCARE**

SPEC WRITER NOTE: Delete between //-----// if not applicable to project. Also delete any other item or paragraph not applicable in the section and renumber the paragraphs.

PART 1 - GENERAL**1.1 DESCRIPTION**

- A. This section describes requirements and procedures which are additive to and compatible with 01 81 13 SUSTAINABLE CONSTRUCTION REQUIREMENTS, and necessary to contribute to sustainability certification under the LEED v4 BD+C: Healthcare rating system (LEED v4 BD+C: HC).

SPEC WRITER NOTE:

1. Ensure that the project specific checklist is provided as attachment to this section.

- B. A copy of the LEED v4 BD+C: HC Project Checklist is attached at the end of this section.

1.2 RELATED WORK

- A. Section 01 81 13 SUSTAINABLE CONSTRUCTION REQUIREMENTS.

1.3 DEFINITIONS

- A. Chain-of-Custody Certificates: Certificates signed by manufacturers certifying that wood used to make products was obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-40-004 v3.0, "FSC Principles and Criteria for Forest Stewardship." Certificates must include evidence that manufacturer is certified for chain of custody by an FSC-accredited certification body.
- B. Regional Materials: Materials that have been extracted, harvested, recovered, manufactured, and purchased, within 100 miles (160 km) of project site. If only a fraction of a product or material is extracted or harvested or recovered and manufactured locally, then only that percentage (by weight) must contribute to regional value. The purchase location, distribution and all points of manufacture are now included in the definition of regional materials.
- C. Recycled Content: The recycled content value of a material assembly shall be determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled value.

1. Postconsumer Recycled Content: Material generated by end users (households, or commercial, industrial, and institutional facilities) of a product, which can no longer be used for its intended purpose that is recycled into raw material for a new product.
 2. Preconsumer Recycled Content: Material diverted from the waste stream during the manufacturing process. Excluded is reutilization of materials, such as rework, regrind, or scrap, generated in a process and capable of being reclaimed within the same process that generated it.
- D. Biobased Material: Products which meet the Sustainable Agriculture Network's Sustainable Agriculture Standard. Biobased raw materials must be tested using ASTM Test Method D6866 and be legally harvested, as defined by the exporting and receiving country. Exclude hide products, such as leather and other animal skin material.
- E. Salvaged or Reused Materials: Construction materials recovered from existing buildings or construction sites and reused. Common salvaged materials include structural beams and post, flooring, doors, cabinetry, brick, and decorative items.
- F. Refurbished Materials: Products that could have been disposed of as solid waste. These products have completed their life cycle as consumer items and are then refurbished for reuse without substantial alteration of their form. Refurbishing includes renovating, repairing, restoring or generally improving appearance, performance, quality, functionality, or value of a product.
- G. Environmental Product Declaration (EPD): A standardized document communicating the environmental effects associated with a product or system's raw material extraction, energy use, chemical makeup, waste generation, and emissions to air, soil, and water.
1. Product-specific declaration: A publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that has at least a cradle to gate scope.
 2. Industry Wide (generic) EPD: Products with third-party certification (Type III), including external verification, in which the manufacturer is explicitly recognized as a participant by the program operator. Must conform to ISO 14025 and EN 15804 or ISO 21930 and have at least a cradle to gate scope.

3. Product-specific Type III EPD: Products with a third-party certification (Type III), including external verification in which the manufacturer is explicitly recognized as the participant by the program operator. Must conform to ISO 14025 and EN 15804 or ISO 21930.
- H. Health Product Declaration (HPD): A compliant HPD provides full disclosure of known hazards and demonstrates chemical inventory of the product to at least 0.1 percent (1000 ppm), in compliance with the Health Product Declaration Open Standard.
- I. Extended Producer Responsibility: An environmental policy approach in which a producer's responsibility for a product is extended to the postconsumer stage of the product's lifecycle. An extended producer responsibility policy shifts responsibility (physically and/or economically, fully or partially) upstream toward the producer and away from municipalities; and creates incentives for producers to take into account environmental considerations when designing their products.
- J. Low-Emitting Products: Building products, both solid and liquid, that are within the waterproofing membrane, that meet specific criteria for Low-Emitting.
1. Inherently Non-Emitting sources: Products that are inherently non-emitting sources of VOCs (stone, ceramic, powder-coated metals, plated or anodized metal, glass, concrete, clay, brick, and unfinished or untreated solid wood) are considered fully compliant without any VOC emissions testing if they do not include integral organic-based surface coatings, binders, or sealants.
 2. Salvages and Reused Materials: Products and materials that are more than one year old at the time of use. If finishes are applied to the product on-site, the finishes must meet the VOC emissions evaluation AND VOC content evaluation requirements.
 3. VOC Emissions Evaluation: Products must be tested according to California Department of Public Health (CDPH) Standard Method v1.1-2010, using the applicable exposure scenario. The manufacturer's or third-party certification must state the exposure scenario used to determine compliance. Compliance of wet-applied products must state the amount applied in mass per surface area.
 4. VOC Content Evaluation: Products meet the VOC content limits outlined in one of the applicable standards and for projects in

North America, methylene chloride and perchloroethylene may not be intentionally added.

- K. Single Product: A "product" includes the physical components and services needed to serve the intended function. If there are similar products within a specification, each contributes as a separate product. For example, wallboard, gypsum, and binder are all required for a single installed assembly and cannot count individually. However, metal studs, wallboard, and concrete masonry units are examples of separate products. Different gloss levels of paints are considered separate products, but different colors of the same paint from the same manufacturer can only be counted once as a single product.
- L. Total Materials Cost: This includes costs for all permanently installed material on the project. This typically includes products from Divisions 3-10, 31 and 32. The materials cost excludes labor but include all taxes and expenses to deliver the material to the project site. The following items are excluded for the Total Materials Cost: All MEP items, special equipment (elevators, escalators, process equipment, and fire suppression systems), and temporary materials.
- M. WaterSense Label: WaterSense Labeled products meet EPA's specifications for water efficiency and performance, and are backed by independent, third-party certification. Flush-/Flow-fixtures that are required to have a WaterSense Label include all newly installed water-closets, urinals, private lavatory faucets, and showerheads.
- N. PBT Source Reduction: Persistent Bioaccumulative and Toxic substances (PBTs) are chemicals that break down slowly in the environment, accumulate in humans and other species and are toxic. Specific PBTs looked at for LEED include Mercury, Lead, Cadmium, and Copper.
- O. Medical Furnishings: Medical Furnishings include mattresses, foams, panel fabrics, cubicle curtains, window coverings, and other textiles. This category also includes furniture designed for use in health care - including surgical tables; procedure, supply, and mobile technology carts; lifting and transfer aids; supply closet carts and shelving; and overbed tables.

1.4 SUBMITTALS

- A. Additional Sustainability Action Plan requirements.

SPEC WRITER NOTE:

- 1. If the Erosion and Sedimentation Control Plan is provided by the design team omit //...//

1. //Erosion and Sedimentation Control Plan which conforms to erosion and sedimentation requirements of the 2012 EPA Construction General Permit or local standards and codes, whichever is more stringent. The plan must describe measures implemented to accomplish the following objectives:
 - a. To prevent loss of soil during construction by stormwater runoff and wind erosion, including protecting topsoil by stockpiling for reuse.
 - b. To prevent sedimentation of storm sewers or receiving streams.
 - c. To prevent pollution of air with dust and particulate matter.//
2. Additional inclusions in Sustainable Construction Progress Reports:
 - a. Inspection report or date-stamped photos confirming compliance with the Erosion and Sedimentation Control Plan.
 - b. Provide updated information submittals using LEED Online forms and USGBC-provided spreadsheets for the following LEED Credits sought for Project.

SPEC WRITER NOTE:

1. Delete between //-----// if not applicable to project. Also delete any other item or paragraph not applicable in the section and renumber the paragraphs.
 2. Project should substitute BPDO credits MRc 2, 3, & 4 with the v4.1 version.
3. //Receipts for salvaged and refurbished materials used for Project, indicating sources and costs for salvaged and refurbished materials.//
 4. //Additional Product Submittals to be provided with manufacturer documentation:
 - a. USGBC BPDO Calculator for Environmental Product Declarations, Sourcing of raw Materials, and Material Ingredients.
 - b. Life-cycle assessment conforming to ISO 14044 with cradle to gate scope.
 - c. Environmental Product Declaration.
 - d. Corporate Sustainability Report.
 - e. Evidence of manufacturer participation in an extended producer responsibility program.
 - f. Health Product Declaration.
 - g. Regional Materials: Indicate location and distance from project site of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating

- cost for each regional material and fraction by weight that is considered regional. Show the purchase location, distribution and all points of manufacture.//
- h. //Biobased Materials: Indicate percent of biobased content. Include statement indicating cost of each relevant product and fraction by weight that is considered biobased material.//
 - i. //Provide chain-of-custody(CoC) certificates for products containing certified wood. An invoice must be included from the CoC certificate holder that lists the vendor's CoC certificate code and an itemized list of the FSC-certified products and specific FSC claims. The invoice must show the entity being invoiced and indicate the delivery is intended for the LEED project.//
 - j. //Provide product documentation to demonstrate that the project did not utilize Lead, Cadmium, and Copper Pipe Joint Material to reduce the release of PBTs associated with the life cycle of building materials.
 - 1) Manufacturer's Data.
 - 2) Proof of Certification.
 - 3) Description of Pipe jointing process (for copper pipe only).//
 - k. //USGBC Furniture and Medical Furnishings Calculator.
 - 1) Minimal Chemical Content.
 - 2) Testing and Modeling of Chemical Content.
 - 3) Multi-Attribute Assessment of Products.//
 - l. //USGBC Construction and Demolition Waste Calculator tracking construction recycling for the project. Provide documentation for all activities.//
 - m. //IAQ Management plan, including checklists, protection measures description, photographs of IAQ measures and records for filtration media.//

SPEC WRITER NOTE:

1. Project should substitute EQc2 Low-emitting Materials with the v4.1 version. The categories listed below are split in accordance with v4.1. Current standards, however, still allow projects using v4 as the base standard to utilize the v4 CDPH testing Method.

5. //USGBC Low-Emitting Materials Calculator, product information showing MSDS, third party certifications, and testing reports for low emitting materials.//
- a. For paints and coatings applied on site within the weatherproofing membrane provide documentation of compliance with low-emitting materials requirements:
 - 1) The manufacturer or third-party certification must state the exposure scenario used to determine compliance. Claims of compliance for wet-applied products must state the amount applied in mass per surface area.
 - 2) For at least 75%, by volume or surface area, provide manufacturers' claims of compliance with the California Department of Public Health (CDPH) Standard Method v1.1-2010 must also state range of total VOCs after 14 days (336 hours), measured as specified in the CDPH Standard Manual v1.1: 0.5 mg/cubic meter or less; between 0.5 and 5.0 mg/cubic meter; or 5.0 mg/cubic meter or more.
 - 3) VOC content for each product.
 - 4) Exclude foamed-in place and sprayed insulation.
 - b. For adhesives and sealants applied on site within the weatherproofing membrane provide documentation of compliance with low-emitting material requirements:
 - 1) The manufacturer or third-party certification must state the exposure scenario used to determine compliance. Claims of compliance for wet-applied products must state the amount applied in mass per surface area.
 - 2) For at least 75%, by volume or surface area, provide manufacturers' claims of compliance with the California Department of Public Health (CDPH) Standard Method v1.1-2010 must also state the range of total VOCs after 14 days (336 hours), measured as specified in the CDPH Standard Manual v1.1: 0.5 mg/cubic meter or less; between 0.5 and 5.0 mg/cubic meter; or 5.0 mg/cubic meter or more.
 - 3) VOC content for each product.
 - c. For flooring installed on site within the weatherproofing membrane provide documentation of compliance with low-emitting material requirements:

- 1) For at least 90%, by cost or surface area, provide manufacturers' claims or third-party certification of compliance with the California Department of Public Health (CDPH) Standard Method v1.1-2010 which states the exposure scenario used to determine compliance.
 - 2) This category includes all types of hard and soft surface flooring (carpet, ceramic, vinyl, rubber, engineered, solid wood, laminates), raised flooring, wall base, underlayments, and other floor coverings.
 - 3) Exclude subflooring (include subflooring in the composite wood category, if applicable). Exclude wet-applied products applied on the floor (include in paints and coatings category).
- d. Composite Wood Products: For at least 75%, by cost or surface area, provide manufacturer documentation which confirms low formaldehyde emissions that meet the California Air Resources Board Composite Wood Products Airborne Toxic Control Measures (ATCM) for formaldehyde requirements for ultra-low-emitting formaldehyde (ULEF) resins or no added formaldehyde resins (NAUF).
- 1) This category includes all particleboard, medium density fiberboard (both medium density and thin), hardwood plywood with veneer, composite or combination core, and wood structural panels or structural wood products.
 - 2) Exclude products covered in the flooring, ceiling, wall panels, or furniture material categories.
- e. Ceilings:
- 1) For at least 90%, by cost or surface area, provide manufacturers' claims or third-party certification of compliance with the California Department of Public Health (CDPH) Standard Method v1.1-2010 which states the exposure scenario used to determine compliance.
 - 2) Category includes all ceiling panels, ceiling tile, surface ceiling structures such as gypsum or plaster, suspended systems (including canopies and clouds), and glazed skylights.
- f. Wall Panels: For at least 75%, by cost or surface area, provide manufacturers' claims or third-party certification of compliance with the California Department of Public Health (CDPH) Standard

Method v1.1-2010 which states the exposure scenario used to determine compliance.

- 1) This category includes all finish wall treatments (wall coverings, wall paneling, wall tile), surface wall structures such as gypsum or plaster, cubicle/curtain/partition walls, trim, interior and exterior doors, wall frames, interior and exterior windows, and window treatments.
 - 2) Exclude cabinetry and vertical structural elements.
- g. Insulation: For at least 75%, by cost or surface area, provide manufacturers' claims or third-party certification of compliance with the California Department of Public Health (CDPH) Standard Method v1.1-2010 which states the exposure scenario used to determine compliance.
- 1) This category includes all thermal and acoustic boards, batts, rolls, sound attention fire blankets, foamed-in place, loose-fill, blown and sprayed insulation.
 - 2) Exclude insulation for HVAC ducts and plumbing piping from the credit. Insulation for HVAC ducts may be included at the project team's discretion.
- h. Furniture: For at least 75%, by cost, provide manufacturers' claims or third-party certification of compliance with the ANSI/BIFMA Standard Method M7.1-2011. Comply with ANSI/BIFMA e3-2011 Furniture Sustainability Standard, Sections 7.6.1, or 7.6.2, or 7.6.2 AND 7.6.3. Laboratories that conduct the tests must be accredited under ISO/IEC 17025 for the test methods they use.
- 1) This category includes all seating, desks and tables, filling/storage, free-standing cabinetry, workspaces, and furnishing items purchased for the project.
 - 2) Exclude office accessories from the credit.

SPEC WRITER NOTE:

1. Any of the optional construction credits that the project is not attempting, the design team may omit //...//.

6. Additional Closeout Submittals:

- a. LEED Online: Final completed LEED Online forms and associated required documentation uploaded to LEED Online for the following prerequisites and credits:
 - 1) Construction activity pollution prevention.
 - 2) Construction and demolition waste management planning.

- 3) //Building product disclosure and optimization - environmental product declaration.//
- 4) //Building product disclosure and optimization - sourcing of raw materials.//
- 5) //Building product disclosure and optimization - material ingredients.//
- 6) //Construction and demolition waste management.//
- 7) //Low-emitting materials.//
- 8) //Construction indoor air quality management plan.//
- 9) //Indoor air quality assessment.//

SPEC WRITER NOTE:

- 1. Omit the following if indoor air testing is not planned for the project.
- 7. //Report from testing and inspecting agency indicating results of indoor-air-quality testing and documentation showing compliance with indoor-air-quality testing procedures and requirements.//

1.5 APPLICABLE PUBLICATIONS

- A. LEED v4 for Healthcare Rating System.
- B. LEED Reference Guide for Building Design and Construction, July 25, 2019, Edition, including all addenda current at date of project registration.
- C. Forest Stewardship Council Principles and Criteria for Forest Stewardship (FSC STD-40-004 v3.0).
- D. Sustainable Agriculture Network's Sustainable Agriculture Standard.
- E. 2012 EPA Construction General Permit.
- F. California Department of Public Health Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, Version 1.1, Emission Testing method for California Specification 01350 (CDPH Standard Method V1.1-2010).
- G. California Air Resources Board Composite Wood Products Airborne Toxic Control Measures (ATCM).
- H. California Air Resources Board (CARB) 2007 Suggested Control Measure (SCM) for Architectural Coatings.
- I. ANSI/BIFMA Standard Method M7.1-2011.
- J. ANSI/BIFMA e3-2011 Furniture Sustainability Standard, Sections 7.6.1 and 7.6.2.

- K. South Coast Air Quality Management District (SCAQMD) Rule 1168, July 1, 2005, and rule amendment date of January 7, 2005.
- L. South Coast Air Quality Management District (SCAQMD) Rule 1113, effective June 3, 2011.
- M. Global Reporting Initiative (GRI) Sustainability Report.
- N. Organization for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises.
- O. U.N. Global Compact: Communication of Progress.
- P. ISO 26000: 2010 Guidance on Social Responsibility.
- Q. Chemical Abstract Service Registration Number (CASRN).
- R. Health Product Declaration Open Standard.
- S. Cradle to Cradle Certified.
- T. GreenScreen v1.2 Benchmark.
- U. GreenScreen List Translator.
- V. REACH Optimization.
- W. EPA's "Compendium of Methods for the Determination of Air Pollutants in Indoor Air".
- X. Guidelines for the Design and Construction of Health Care Facilities, 2010 Edition Facility Guidelines Institute: fgiguidelines.org.
- Y. ASTM B813 for Copper Flux.
- Z. ASTM B828, Standard for Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings.

PART 2 - PRODUCTS

PART 2 -

2.1 PERFORMANCE CRITERIA

SPEC WRITER NOTE:

1. The following are options for the LEED v4 credit 'Building product disclosure and optimization - environmental product declarations.' This credit should be substituted for v4.1 'Environmental Product Declarations'. The information below aligns with the v4.1 requirements and scoring for points. Coordinate with project team to determine which option is being pursued. When this credit is not being pursued omit //...//.
- A. //Environmental Product Declarations: Achieve one or more of the options below, for a maximum of 2 points.

1. Option 1. Environmental Product Declaration (EPD) (1 point): At least 20 permanently installed products from at least 5 different manufacturers must have one of the following:
 - a. Life-cycle Assessment and environmental product declarations:
 - 1) Products with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that has at least a cradle to gate scope are valued as one whole product for the purpose of credit achievement calculation.
 - 2) Products with an internally critically reviewed LCA in accordance with ISO 14071, which conform to ISO 14025, and EN 15804 or ISO 21930 and have at least a cradle to gate scope are valued at one whole product for the purpose of credit achievement calculation.
 - 3) Industry-wide (generic) EPD - Products with third-party certification (Type III), including external verification in which the manufacturer is explicitly recognized as a participant by the program operator and conform with ISO 14025, and EN 15804 or ISO 21930 and have at least a cradle to gate scope are valued as one whole product for the purposes of credit achievement calculation.
 - b. Environmental Product Declarations:
 - 1) Product-specific Type III EPD - Products with third-party certification (Type III), including external verification and external critical review, and conform to ISO 14025, and EN 15804 or ISO 21930 and have at least cradle to gate scope are valued as 1.5 products for the purposes of credit achievement calculation.
2. Option 2. Embodied Carbon/LCA Optimization (1 point): Use products that have a compliant embodied carbon optimization report or action plan separate from the LCA or EPD. Use at least 5 permanently installed products sourced from at least three different manufacturers:
 - a. Embodied Carbon/LCA Action Plan:
 - 1) Product Specific LCA or product-specific Type III EPD.
 - 2) Prepared by the manufacturer and signed by company executive.
 - 3) Valued at half of a product.
 - b. Reductions in Embodied Carbon: Less than 10% reduction in GWP relative to baseline.

- 1) Baseline: Product-specific LCA, Product-specific Type III EPD, or Industry-wide Type III EPD.
 - 2) Optimized: Product-specific LCA or Product-specific Type III EPD.
 - 3) Comparative Analysis is verified by an independent party
 - 4) Valued at one whole product.
- c. Reductions in Embodied Carbon: 10%+ reduction in GWP relative to baseline.
- 1) Baseline: Product-specific LCA, Product-specific Type III EPD, or Industry-wide Type III EPD.
 - 2) Optimized: Product-specific LCA or Product-specific Type III EPD.
 - 3) Comparative Analysis is verified by an independent party.
 - 4) Valued at 1.5 products.
- d. Reductions in Embodied Carbon: 20%+ reduction in GWP and 5%+ reduction in two additional impact categories, relative to baseline.
- 1) Baseline: Product-specific LCA, Product-specific Type III EPD, or Industry-wide Type III EPD.
 - 2) Optimized: Product-specific LCA or Product-specific Type III EPD.
 - 3) Comparative Analysis is verified by an independent party.
 - 4) Valued at 1.5 products.
 - 5) Impact Categories:
 - a) Global warming potential (greenhouse gases), in CO₂e.
 - b) Depletion of stratospheric ozone layer, in kg CFC-11e.
 - c) Acidification of land and water sources, in moles H⁺ or kg SO₂e.
 - d) Eutrophication, in kg nitrogen or kg phosphate equivalent.
 - e) Formation of tropospheric ozone, in kg NO_x, kg O₃ eq, or kg ethene.
 - f) Depletion of nonrenewable energy resources, in MJ using CML / depletion of fossil fuels in TRACI.
- e. For Credit achievement calculation, products sourced (extracted, manufactured, purchased) within 100 miles (160 km) of project site are valued at twice their base contributing number of products, up to a maximum of 2 products.//

SPEC WRITER NOTE:

1. The following are options for the LEED v4 credit 'Building product disclosure and optimization - sourcing of raw materials.' This credit should be substituted for v4.1 'Sourcing of Raw Materials'. The information below aligns with the v4.1 requirements and scoring for points. Coordinate with project team to determine which option is being pursued and edit accordingly. When this credit is not being pursued omit //...//.
- B. //Sourcing of Raw Materials (1-2 points): Based on the total value of permanently installed building products in the project, use products sourced from at least three different manufacturers that meet at least one of the responsible sourcing and extraction criteria below for at least 15%, by cost (1 Point) - OR - Use products sourced from at least five different manufacturers that meet at least one of the responsible sourcing and extraction criteria below for at least 30%, by cost (2 Points).
1. Extended producer responsibility. Products purchased from a manufacturer (producer) that participates in an extended producer responsibility program or is directly responsible for extended producer responsibility. Products meeting extended producer responsibility criteria are valued at 50 percent of their cost for the purposes of credit achievement calculation.
 2. Biobased materials. Biobased products and materials other than wood must be tested using ASTM Test Method D6866 or equivalent method ISO 16620-2, or be certified to the USDA BioPreferred Voluntary Labeling Initiative that includes verification via ASTM 6866 testing. Exclude hide products, such as leather and other animal skin material.
 - a. Biobased products that meet the criteria above are valued at 50% of the cost multiplied by the biobased content of the product for the purpose of credit achievement calculation.
 - b. Biobased products that meet the Sustainable Agriculture Network's Sustainable Agriculture Standard in addition to the testing requirements above are valued at 100% of the cost multiplied by the biobased content of the product for the purposes of credit achievement calculation.
 3. Wood products. Wood products must be certified by the Forest Stewardship Council or USGBC-approved equivalent. Products meeting

- wood products criteria are valued at 100% of their cost for the purposes of credit achievement calculation.
4. Materials reuse. Reuse includes salvaged, refurbished, or reused products. Products meeting materials reuse criteria are valued at 200% of their cost for the purposes of credit achievement calculation.
 5. Recycled content. Recycled content is the sum of postconsumer recycled content plus one-half the pre-consumer recycled content, based on weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value. Products meeting recycled content criteria are valued at 100% of their cost for the purposes of credit achievement calculation.
 6. For credit achievement calculation, products sourced (extracted, manufactured, and purchased) within 100 miles (160 km) of project site are valued at twice their base contributing cost, up to 200% of cost.//

SPEC WRITER NOTE:

1. The following are options for the LEED v4 credit 'Building product disclosure and optimization - material ingredients.' This credit should be substituted for v4.1. The information below aligns with the v4.1 requirements and scoring for points. Coordinate with project team to determine which option(s) is being pursued and edit accordingly. When this credit is not being pursued omit // //.
- C. //Material Ingredients: Achieve one or more of the options below, for a maximum of 2 points.
1. Option 1. Material Ingredient Reporting (1 point): Use at least 20 permanently installed products from at least 5 different manufacturers that use any of the following programs to demonstrate chemical inventory of the product to at least 0.1% (1000 ppm). Any compliant reports from below with third-party verification that includes the verification of content inventory are worth 1.5 products for credit achievement calculations.
 - a. ANSI/BIFMA e3 Furniture Sustainability Standard. The documentation from the assessor or scorecard from BIFMA must demonstrate the product earned at least 3 points under 7.5.1.3

- Advanced Level in e3-2014 or 3 points under 7.4.1.3 Advanced Level in e3-2012.
- b. Cradle to Cradle. The end use product has Material Health Certificate or is Cradle to Cradle Certified under standard version 3 or later with a Material Health achievement level at the Bronze level or higher.
 - c. Declare. The Declare product label must meet the following requirements:
 - 1) Declare labels designed as Red List Free, LBC Red List Free, or Declared.
 - 2) Declare labels designated as LBC Red List Approved or LBC Compliant that demonstrate content inventory to 0.1% (1000ppm).
 - d. Facts - NSF/ANSI 336: Sustainability Assessment for Commercial Furnishings Fabric at any certification level
 - e. Global Green TAG PHD labels issued after January 1, 2020.
 - f. Health Product Declaration. The end use product has a published, complete Health Product Declaration with full disclosure of known hazards in compliance with the Health Product Declaration Open Standard.
 - g. Living Product Challenge. The included Declare product label must demonstrate content inventory to 0.1% (1000ppm).
 - h. Manufacturer Inventory. The manufacturer has published complete content inventory for the product following these guidelines:
 - 1) A publicly available inventory of ingredients identified by name and Chemical Abstract Service Registration Number (CASRN).
 - 2) Materials defined as trade secret or intellectual property may withhold the name and/or CASRN/EC Number but must disclose ingredient/chemical role, amount and hazard score/class using either:
 - a) Greenscreen List Translator (LT) score and/or Full GreenScreen Benchmark (BM)
 - b) The Globally Harmonized System of Classification and Labeling of Chemicals rev.6 (2015) (GHS)
 - 1) The hazard screen must be applied to each trade secret ingredient and the inventory lists the hazard

category for each of the health hazards included in Part 3 of GHS (e.g. "GHS Category 2 Carcinogen").

i. Product Lens Certification.

2. Option 2. Material Ingredient Optimization (1 point): Use products that have a compliant material ingredient optimization report or action plan. Use at least 5 permanently installed products sourced from at least three different manufacturers. Products are valued as noted below:
 - a. Material Ingredient Screening and Optimization Action Plan (value at ½ product).
 - 1) Manufacturer self-reported.
 - b. Advanced Inventory & Assessment (value at 1 product).
 - 1) Inventory to 0.01% by weight (100 ppm) and at least 75% by weight of product assessed using GreenScreen Translator (www.greenscreenchemicals.org).
 - a) Cradle-to-Cradle (bronze level).
 - b) Declare (third-party verified "Red List Free").
 - c) Health Product Declaration (HPD).
 - 1) Must meet optimization and verification criteria.
 - 2) Must be third-party verified.
 - d) Living Product Challenge certified products that include Red List Free or LBC Red List Free Declare label.
 - e) Manufacturer Inventory.
 - 1) Must meet all optimization and verification criteria.
 - c. Material Ingredient Optimization (value at 1.5 products).
 - 1) Inventory to 0.01% by weight (100 ppm) and at least 95% by weight of product assessed using GreenScreen Translator (www.greenscreenchemicals.org).
 - a) Cradle-to-Cradle (Silver or higher).
 - b) Health Product Declaration (HPD).
 - 1) Must meet optimization and verification criteria.
 - 2) Must be third-party verified.
 - 3) GreenScreen benchmark (No BM-1 hazards).
 - c) Living Product Challenge certified products that achieve Imperative 09: Transparent Material Health.
 - d) Manufacturer Inventory.
 - 1) Must meet all optimization and verification criteria.//

SPEC WRITER NOTE:

1. The following are requirements for the LEED v4 credit 'PBT Source Reduction - Lead, Cadmium, and Copper.' When this credit is not being pursued omit //...//.

D. //PBT Source Reduction - Lead, Cadmium, and Copper:

1. Lead: For water intended for human consumption, specify and use solder, flux, pipe, pipe fittings, plumbing fittings, and faucets to connect plumbing pipe on site that meets the California AB1953 standard, which specifies that solder not contain more than 0.2% lead, flux not more than a weighted average of 0.25% lead for wetted surfaces, and pipes, fittings, and faucets have a weighted average lead content of the wetted surface area of not more than 0.25%.
 - a. The "lead free" label as defined by the Safe Drinking Water Act (SDWA) does not provides adequate screening for the purposes of this credit.
 - b. Specify and use lead-free roofing and flashing.
 - c. Specify and use electrical wire and cable with lead content less than 300 parts per million.
 - d. Specify no use of interior or exterior paints containing lead.
 - e. For renovation projects, ensure the removal and appropriate disposal of disconnected wires with lead stabilizers, consistent with the 2002 National Electric Code requirements.
 - f. Lead used for radiation shielding and copper used for MRI shielding are exempt.
2. Cadmium: Specify no use of interior or exterior paints containing intentionally added.
3. Copper: For copper pipe applications, reduce or eliminate joint-related sources of copper corrosion:
 - a. Use mechanically crimped copper joint systems.
 - b. Specify that all solder joints comply with ASTM B828 2002, and specify and use ASTM B813 2010 for flux.//

SPEC WRITER NOTE:

1. The following are requirements for the LEED v4.1 credit 'Furniture and Medical Furnishings'. When this credit is not being pursued omit //...//.

E. //Furniture and Medical Furnishings (1-2 points): Use at least 30% (1 point) or 40% (2 points), by cost, of all freestanding furniture and medical furnishings that meet the criteria in one of the following

three options. Include built-in casework and built-in millwork in the base building calculations, even if manufactured off site.

1. Option 1. Minimal Chemical Content: All components that constitute at least 5%, by weight, of a furniture or medical furnishing assembly, including textiles, finishes, and dyes, must contain less than 100 parts per million (ppm) of at least four of the five chemical groups:
 - a. Urea formaldehyde;
 - b. heavy metals, including mercury, cadmium, lead, and antimony;
 - c. hexavalent chromium in plated finishes consistent with the European Union Directive on the Restriction of the Use of Certain Hazardous Substances (EU RoHS);
 - d. stain and nonstick treatments derived from perfluorinated compounds (PFCs), including perfluorooctanoic acid (PFOA); and
 - e. added antimicrobial treatments.
2. Option 2. Testing and Modeling of Chemical Content: All compounds of a furniture or medical furnishing assembly, including textiles, finishes, and dyes, must contain less than 100 parts per million (ppm) of at least two of the five chemicals or materials listed in Option 1. New furniture or medical furnishings must be in accordance with ANSI/BIFMA Standard Method M7.1-2011. Comply with ANSI/BIFMA e3-2010 Furniture Sustainability Standard, Sections 7.6.1 and 7.6.2, using either the concentration modeling approach or the emissions factor approach. Model the test results using the open plan, private office, or seating scenario in ANSI/BIFMA M7.1, as appropriate. Documentation submitted for furniture must indicate the modeling scenario used to determine compliance.
 - a. USGBC-approved equivalent testing methodologies and contaminant thresholds are also acceptable.
 - b. Salvaged and reused furniture more than one year old at the time of use is considered compliant, provided it meets the requirements for any site-applied paints, coatings, adhesives, and sealants.
3. Option 3. Building Product Disclosure and Optimization: Use products that meet at least one of the criteria below. Each product can receive credit for each criterion met. The scope of any EPD must be at least cradle to gate.
 - a. Life-cycle Assessment and environmental product declarations:

- 1) Products with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that has at least a cradle to gate scope are valued as one whole product for the purpose of credit achievement calculation.
 - 2) Product-Specific Type III EPD - Internally Reviewed. Products with an internally critically reviewed LCA in accordance with ISO 14071. Products with product-specific internal EPDs which conform to ISO 14025, and EN 15804 or ISO 21930 and have at least a cradle to gate scope are valued as one whole product for the purposes of credit achievement calculation.
 - 3) Industry-wide Type III EPD - Products with third-party certification (Type III), including external verification in which the manufacturer is explicitly recognized as a participant by the program operator. Products with industry-wide EPDs, which conform with ISO 14025, and EN 15804 or ISO 21930 and have at least a cradle to gate scope are valued as one whole product for the purposes of credit achievement calculation.
- b. Environmental Product Declarations:
- 1) Product-specific Type III EPD - Products with third-party certification (Type III), including external verification and external critical review, and conform to ISO 14025, 14040, 14044, and EN 15804 or ISO 21930 and have at least cradle to gate scope are valued as 1.5 products for the purposes of credit achievement calculation.
- c. Extended producer responsibility. Products purchased from a manufacturer (producer) that participates in an extended producer responsibility program or is directly responsible for extended producer responsibility. Products meeting extended producer responsibility criteria are valued at 50% of their cost for the purposes of credit achievement calculation.
- d. Biobased materials. Biobased products and materials other than wood must be tested using ASTM Test Method D6866 or equivalent method ISO 16620-2, or be certified to the USDA BioPreferred Voluntary Labeling Initiative that includes verification via ASTM 6866 testing. Exclude hide products, such as leather and other animal skin material.

- 1) Biobased products that meet the criteria above are valued at 50% of the cost multiplied by the biobased content of the product for the purposes of credit achievement calculation.
 - 2) Biobased products that meet the Sustainable Agriculture Network's Sustainable Agriculture Standard in addition to the testing requirements above are valued at 100% of the cost multiplied by the biobased content of the product for the purposes of credit achievement calculation.
- e. Wood products. Wood products must be certified by the Forest Stewardship Council or USGBC-approved equivalent. Products meeting wood products criteria are valued at 100% of their cost for the purposes of credit achievement calculation.
 - f. Materials reuse. Reuse includes salvaged, refurbished, or reused products. Products meeting materials reuse criteria are valued at 200% of their cost for the purposes of credit achievement calculation.
 - g. Recycled content. Recycled content is the sum of postconsumer recycled content plus one-half the pre-consumer recycled content, based on weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value. Products meeting recycled content criteria are valued at 100% of their cost for the purposes of credit achievement calculation.
 - h. For credit achievement calculation, products sourced (extracted, manufactured, and purchased) within 100 miles (160 km) of project site are valued at twice their base contributing cost, up to 200% of cost.//

SPEC WRITER NOTE:

1. The following are options for the LEED v4 credit 'Low-emitting Materials.' This credit should be substituted for v4.1. The information below aligns with the v4.1 requirements and scoring for points. Coordinate with project team to determine which option(s) is being pursued and edit accordingly. When this credit is not being pursued omit //...//.
- F. //Low Pollutant-Emitting Materials (1-3 points): Use materials on the building interior (everything within the waterproofing membrane) that meet the low-emitting criteria below. Meet the requirements for two

categories below for 1 point, three categories for 2 points, and four categories for 3 points. An exemplary performance point can be earned by achieving 5 categories or by reaching a 90% threshold in at least three categories.

1. Paints and Coatings: For field applications that are inside the weatherproofing system, 75% (by volume or area) of paints and coatings meet the emissions evaluation and 100% meet the VOC content evaluation. To meet the 100% requirement for VOC content evaluation, a VOC budget may be used. See part 2.1, section F.9 Low-Emitting Criteria for further information regarding the evaluations.
 - a. Anti-Corrosive/Antirust Paints: 100 g/L.
 - b. Clear Wood Finish, Lacquer: 275 g/L.
 - c. Clear Wood Finish, Sanding Sealer: 275 g/L.
 - d. Clear Wood Finish, Varnish: 275 g/L.
 - e. Floor Coating: 50 g/L.
 - f. Interior Flat Paint, Coating or Primer: 50 g/L.
 - g. Interior Non-Flat Paint, Coating or Primer: 50 g/L.
 - h. Shellac, Clear: 730 g/L.
 - i. Shellac, Pigmented: 550 g/L.
 - j. Stain: 250 g/L.
 - k. Concrete Curing Compounds: 100 g/L.
 - l. Faux Finishing Coatings (Decorative, Glazes, Japan): 350 g/L.
 - m. Magnesite Cement Coatings: 450 g/L.
 - n. Waterproofing Sealers: 100 g/L.
 - o. Wood Preservatives: 350 g/L.
 - p. Low-Solids Coatings: 120 g/L.
 - q. Dry-Fog Coatings: 150 g/L.
 - r. Primers, Sealers, and Undercoaters: 100 g/L.
 - s. Zinc-Rich Industrial Maintenance Primers: 100 g/L.
 - t. Pretreatment Wash Primers: 420 g/L.
2. Adhesives and Sealants: For field applications that are inside the weatherproofing system, 75% of adhesives and sealants meet the emissions evaluation and 100% meet the VOC content evaluations. See part 2.1, section F.9 Low-Emitting Criteria for further information regarding the evaluations. The adhesives and sealants product category includes all interior adhesives and sealants wet-applied on site.
 - a) Wood Glues: 30 g/L.

- b) Metal-to-Metal Adhesives: 30 g/L.
 - c) Adhesives for Porous Materials (Except Wood): 50 g/L.
 - d) Subfloor Adhesives: 50 g/L.
 - e) Plastic Foam Adhesives: 50 g/L.
 - f) Carpet Adhesives: 50 g/L.
 - g) Cove Base Adhesives: 50 g/L.
 - h) Gypsum Board and Panel Adhesives: 50 g/L.
 - i) Rubber Floor Adhesives: 60 g/L.
 - j) Ceramic Tile Adhesives: 65 g/L.
 - k) Multipurpose Construction Adhesives: 70 g/L.
 - l) Fiberglass Adhesives: 80 g/L.
 - m) Contact Adhesives: 80 g/L.
 - n) Structural Glazing Adhesives: 100 g/L.
 - o) Wood Flooring Adhesives: 100 g/L.
 - p) Single-Ply Roof Membrane Adhesives: 250 g/L.
 - q) Top and Trim Adhesives: 250 g/L.
 - r) Plastic Cement Welding Compounds: 250 g/L.
 - s) CPVC Welding Compounds: 490 g/L.
 - t) PVC Welding Compounds: 510 g/L.
 - u) Adhesive Primer for Plastic: 550 g/L.
 - v) Sheet-Applied Rubber Lining Adhesives: 850 g/L.
 - w) Other Adhesives: 250 g/L.
 - x) Architectural Sealants: 250 g/L.
3. Flooring: A minimum of 90% of flooring products (by cost or surface area) meet the emissions evaluation or inherently non-emitting sources criteria or salvaged and reused materials criteria. See part 2.1, section F.9 Low-Emitting Criteria for further information regarding the evaluations and criteria. Subflooring is excluded. All flooring adhesives must comply with Adhesives and Sealants low-emitting materials criteria.
4. Walls: A minimum of 75% of wall panel products meet the emissions evaluation or inherently non-emitting sources criteria or salvaged and reused materials criteria. See part 2.1, section F.9 Low-Emitting Criteria for further information regarding the evaluations and criteria. Wall panel products include wall paneling, wall coverings, wall tile, surface wall structures, cubicle/curtain/partition walls, trim, doors, frames, windows, and

- window treatments. Removable/interchangeable fabric panels, built-in cabinetry, and vertical structural elements are excluded.
5. Ceilings: A minimum of 90% of ceilings meet the emissions evaluation or inherently non-emitting sources criteria or salvaged and reused materials criteria. See part 2.1, section F.9 Low-Emitting Criteria for further information regarding the evaluations and criteria. Ceiling products include ceiling panels, ceiling tile, surface ceiling structures, suspended systems, and glazed skylights. Overhead structural elements are excluded.
 6. Composite Wood: A minimum of 75% of all composite wood meet the formaldehyde emissions evaluation meet the California Air Resources Board ATCM for formaldehyde requirements for ultra-low-emitting formaldehyde (ULEF) resins or no added formaldehyde resins (NAF) or salvaged and reused materials criteria. Composite wood materials include particleboard, MDF, hardwood veneer plywood, and structural composite wood.
 7. Insulation: A minimum of 75% of insulation products meet the emissions evaluation. See part 2.1, section F.9 Low-Emitting Criteria for further information regarding the evaluation. Insulation products include all thermal and acoustic boards, batts, rolls, blankets, sound attenuation fire blankets, and foamed-in-place, loose-fill, blown, and sprayed insulation. HVAC duct and plumbing piping insulation are excluded.
 8. Furniture: At least 75% of all furniture in the project scope of work, by cost, meets the furniture emissions evaluation, OR inherently non-emitting sources criteria, OR salvaged and reused materials criteria. See part 2.1, section F.9 Low-Emitting Criteria for further information regarding the evaluations and criteria.
 - a. The furniture product category includes all seating, desks, and tables, filing/storage, free-standing cabinetry, workspaces, and furnishing items purchased for the project.
 9. Low-Emitting Criteria:
 - a. Inherently non-emitting sources:
 - 1) Product is an inherently non-emitting source of VOCs (stone, ceramic, powder-coated metals, plated or anodized metal, glass, concrete, clay brick, and unfinished or untreated solid wood) and has no binders, surface coatings, or sealants that include organic chemicals.

- b. Salvaged and reused materials:
 - 1) Product is more than one year old at the time of use. If finishes are applied to the product on-site, the finishes must meet the VOC emissions evaluation AND VOC content evaluation requirements.
- c. VOC Emissions evaluation:
 - 1) Product has been tested according to California Department of Public Health (CDPH) Standard Method v1.2-2017 (v1.1-2010 also currently acceptable for LEEDv4) and complies with the VOC limits of the method.
- d. VOC Content evaluation:
 - 1) Product meets the VOC content limits outlined in one of the applicable standards and for projects in North America, methylene chloride and perchloroethylene may not be intentionally added.
 - 2) Statement of product compliance must be made by the manufacturer or a USGBC-approved third-party.
 - 3) Any testing must follow the test method specified in the applicable regulation. If the applicable regulation requires subtraction of exempt compounds, any content of intentionally added exempt compounds larger than 1% weight by mass (total exempt compounds) must be disclosed.
 - a) Paints and Coatings:
 - 1) California Air Resource Board (CARB) 2007 Suggested Control Measure (SCM) for Architectural Coatings.
 - 2) South Coast Air Quality Management District (SCAQMD) Rule 1113, effective February 5, 2016.
 - b) Adhesives and sealants:
 - 1) SCAQMD Rule 1168, October 6, 2017.
- e. Formaldehyde Emissions evaluation - Product meets one of the following:
 - 1) Certified as ultra-low-emitting formaldehyde (ULEF) product under EPA Toxic Substances Control Act, Formaldehyde Emission Standards for Composite Wood Products or California Air Resources Board (CARB) Airborne Toxic Control Measure (ATCM).
 - 2) Certified as no added formaldehyde (NAF) product by EPA or CARB ATCM.

- 3) Wood structural panel manufactured according to PS 1-09 or PS 2-10 (or one of the standards considered by CARB to be equivalent to PS 1 or PS 2) and labeled bond classification Exposure-1 or Exterior.
 - 4) Structural wood product manufactured according to ASTM D 5456 (for structural composite lumber), ANSI A190.1 (for glued laminated timber), ASTM D 5055 (for I-joists), ANSI PRG 320 (for cross-laminated), or PS 20-15 (for finger-jointed lumber).
- f. Furniture emissions evaluation:
- 1) Product has been tested in accordance with ANSI/BIFMA Standard Method M7.1-2011 (R2016) and complies with ANSI/BIFMA Furniture Sustainability Standard, Sections 7.6.1 (for half credit, by cost) OR 7.6.2 (for full credit, by cost), OR 7.6.2 AND 7.6.3 for one and a quarter credit, by cost. Laboratories that conduct the tests must be accredited under ISO/IEC 17025 for the test methods they use.
 - 2) Statements of product compliance must include the exposure scenario(s). Organizations that certify manufacturers' claims must be accredited under ISO/IEC 17065.//

PART 3 - EXECUTION

PART 3 -

3.1 CONSTRUCTION INDOOR AIR QUALITY TESTING REQUIREMENTS

SPEC WRITER NOTE:

1. For the LEED credit Indoor Air Quality Assessment, Option 1 Flush-Out is satisfied by the requirements included in 01 81 13. Retain below only when air testing is also to be included in the project. If not utilizing Option 2 Air Quality Testing, omit //...//
- A. //Construction Indoor Air Quality Management additional requirement:
1. Perform air quality testing.
 - a. Conduct baseline indoor-air-quality testing, after construction ends and prior to occupancy, using testing protocols consistent with the EPA's "Compendium of Methods for the Determination of Air Pollutants in Indoor Air," and as additionally detailed in the LEED Reference Guide for Building Design and Construction, 2013 Edition.
 - b. Demonstrate that contaminant maximum concentrations listed below are not exceeded:

- 1) Formaldehyde: 27 ppb.
 - 2) Particulates (PM10): 50 micrograms/cu. m.
 - 3) Ozone (for buildings in EPA nonattainment areas): 0.075 ppm.
 - 4) Total Volatile Organic Compounds (TVOC): 500 micrograms/cu. m.
 - 5) Target chemicals listed in CDPH Standard Method v1.1, Table 4-1, except formaldehyde: CDPH Standard Method v1.1-2010, Allowable Concentrations, Table 4-1.
 - 6) Carbon Monoxide: 9 ppm and no greater than 2 ppm above outdoor levels.
- c. For each sampling point where maximum concentration limits are exceeded, conduct additional flush-out with outside air and retest the specific parameter(s) exceeded to indicate the requirements are achieved. Repeat procedure until all requirements have been met. When retesting non-complying building areas, take samples from same locations as in the first test.
- d. Air-sample testing must be conducted as follows:
- 1) Measurements must be conducted prior to occupancy but during normal occupied hours, and with building ventilation system starting at the normal daily start time and operated at minimum outside air flow rate for occupied mode throughout duration of air testing.
 - 2) Building must have all interior finishes installed including millwork, doors, paint, carpet, and acoustic tiles. Non-fixed furnishings such as workstations and partitions are encouraged, but not required, to be in place for testing.
 - 3) Number of sampling locations varies depending on size of building and number of ventilation systems. For each portion of building served by a separate ventilation system, number of sampling points must not be less than one per 25,000 sq. ft. (2300 sq. m) or for each contiguous floor area, whichever is larger, and must include areas with the least ventilation and greatest presumed source strength.
 - 4) Air samples must be collected between 3 and 6 feet (0.9 and 1.8 m) from the floor to represent the breathing zone of occupants, and over a minimum four-hour period.//

3.2 ATTACHMENTS

A. LEED v4 BD+C: HC Project Checklist

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