

SECTION 01 81 13.11**SUSTAINABILITY CERTIFICATION REQUIREMENTS - LEED HC V3****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 2009 for Healthcare New Construction and Major Renovations rating system (LEED HC v3).
- B. Refer to the 'Guiding Principles Checklist LEED 2009 for Healthcare' for mandatory credits.

SPEC WRITER NOTE:

- 1. Ensure that the project specific checklist is provided as attachment to this section.
- C. A copy of the LEED HC v3 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-01-001, "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, as well as manufactured within 500 miles (800 km) of project site. If only a fraction of a product or material is extracted/harvested/recovered and manufactured locally, then only that percentage (by weight) must contribute to regional value.
- C. Pre-Consumer Recycled Content: See 01 81 13 for definition, with the following constraint which applies to the LEED for Healthcare only: Supplemental cementitious material derived from coal fired power plant wastes can be considered Recycled Content only if they do not have mercury content >5.5 ppb (0.0055 mg/L). Fly ash generated as a by-product of municipal solid waste incinerators does not qualify as a recycled-content.

- D. Rapidly Renewable Material: Building materials and products which are made from plants that are typically harvested within a 10-year or shorter cycle.
- 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.

1.4 SUBMITTALS

- A. Additional Sustainability Action Plan requirements.
 - 1. Erosion and Sedimentation Control Plan which conforms to erosion and sedimentation requirements of the 2003 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 the air with dust and particulate matter.
 - 2. Noise and Vibration Control Plan based on the British Standard (BS 5228).

SPEC WRITER NOTE:

- 1. The following item is relevant for an occupied healthcare facility undergoing renovation, an addition adjacent to occupied healthcare facilities, or new construction with phased occupancy.
- 3. // Infection Control Plan with required precautions to meet the 2010 FGI Guidelines for Design and Construction of Health Care Facilities and the Joint Commission standards and describing the use of the Infection Control Risk Assessment (ICRA) standards as a guideline for construction activities to assess risk and select mitigation procedures. //

4. Moisture Control Plan to address measures that will maintain dry conditions to protect stored on-site and installed absorptive materials from moisture damage. Also include strategies for protecting the building from moisture intrusion and occupant exposures to dangerous mold spores.

SPEC WRITER NOTE:

1. Omit the following if LEED for Healthcare IEQc4 Low Emitting Materials Group 5 Exterior Applied Products is not being pursued.
5. // A plan to manage fumes and avoid infiltration to occupied spaces, which complies with procedures established by NIOSH's Asphalt Fume Exposures During the Application of Hot Application to Roofs (Publication No. 2003-112). //
- B. Additional inclusions in Sustainable Construction Progress Reports
1. Inspection report or date-stamped photos confirming compliance with the Erosion and Sedimentation Control Plan.
 2. Provide updated information submittal using LEED Online forms and USGBC-provided spreadsheets for the following LEED Credits sought for Project.
- C. Additional Product Submittals
1. Receipts for salvaged and refurbished materials used for Project, indicating sources and costs for salvaged and refurbished materials.
 2. Submit product data as follows:
 - a. Statement indicating source of supplemental cementitious materials. For supplemental cementitious material derived from coal fired power plant wastes, provide a statement indicating mercury content.
 - b. Regional Materials: Indicate location and distance from Project 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.
 - c. Rapidly Renewable Materials: Indicate percent of rapidly renewable content. Include statement indicating cost of each relevant product and fraction by weight that is considered rapidly renewable material.
 - d. Provide chain-of-custody certificates for products containing certified wood. Include statement indicating cost for each

product with certified wood and fraction by weight that is certified wood.

SPEC WRITER NOTE:

1. Omit the following if MRc4.2 PBT Source Reduction - Lead, Cadmium, and Copper is not being pursued.

3. // Submit product data for PBT Source Reduction: Lead, Cadmium and Copper as follows:
 - a. Product data for solder and flux used to connect piping for water for human consumption indicating lead content. Include statement indicating that the product meets the California AB1953 standard.
 - b. Product data for copper piping, pipe fittings, and faucets indicating lead content. Include statement indicating that the product meets the California AB1953 standard.
 - c. Provide a statement which confirms that copper pipe included in scope of Project has joints that are mechanically crimped or connected with ASTM B828 and ASTM B813-compliant flux.
 - d. Product data for roofing and flashing indicating lead content.
 - e. Product data or manufacturer statement for interior and exterior paints indicating lead and cadmium content.
 - f. Product data for electrical wire and cable indicating lead content. Include statement indicating that lead content is less than 300ppm.
 - g. Provide a statement indicating that removal and appropriate disposal of disconnected wires with lead stabilizers has occurred and was consistent with 2002 National Electric Code and IEQ Prerequisite 3 requirements. //

D. Additional Closeout Submittals

1. LEED Online: Final completed LEED Online forms and associated required documentation uploaded to LEED Online for the following prerequisites and credits:
 - a. SSp1 Construction Activity Pollution Prevention.
 - b. MRc2 Construction Waste Management.
 - c. MRc3 Sustainably Sourced Materials and Products.
 - d. // MRc4.2 PBT Source Reduction: Lead, Cadmium and Copper. //
 - e. EQc3.1 Construction IAQ Management Plan - During Construction.
 - f. EQc3.2 Construction IAQ Management Plan - Before Occupancy.
 - g. EQc4 Low-Emitting Materials:
 - 1) Interior Adhesives and Sealants.

- 2) Wall and Ceiling Finishes.
- 3) Flooring.
- 4) Composite Wood, Agrifiber Products, and Batt Insulation Products.
- h. // Exterior Applied Products. //
- 2. Additional submittals to confirm implementation of the Construction Indoor Air Quality Management Plan, for LEED for Healthcare:
 - a. Signed statement confirming that active outdoor air intakes and return grilles with filtration media were protected during construction.
 - b. Signed statement confirming that construction procedures were scheduled to minimize exposure of absorbent materials to VOC emissions. This schedule included completing "wet" procedures such as painting and sealing before storing or installing "dry" absorbent materials such as carpet or ceiling tiles.
 - c. Signed statement confirming that fuels, solvents, and other sources of VOCs were stored separately from absorbent materials.
 - d. Signed statement confirming that, during construction, smoking was prohibited inside the building and within 50 feet of the building entrance.

SPEC WRITER NOTE:

- 1. The following item is relevant for an occupied healthcare facility undergoing renovation, an addition adjacent to occupied healthcare facilities, or new construction with phased occupancy.
- 3. // Signed statement confirming that Infection Control Risk Assessment (ICRA) standards were used as a guideline for construction activities to assess risk and to select mitigation procedures. //
- 4. Signed statement confirming that noise emissions and vibrations from construction equipment and other non-road engines were reduced by using equipment with low-noise emission design or the lowest decibel level available that meets performance requirements in the British Standard (BS 5228).
- 5. Signed statement confirming that construction crews wore ear protection in areas where sound levels exceeded 85 dB for extended periods of time.

SPEC WRITER NOTE:

1. Omit the following if indoor air testing is not planned for the project.
6. // 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. //

SPEC WRITER NOTE:

1. When SSc7.1 Heat Island Effect - Non-Roof is being pursued and the SRI of existing hardscape is included in the compliant calculation for compliance, include the following requirement. Otherwise, omit.
7. // Compliance with SSc7.1 Heat Island Effect - Non-Roof is being partially supported by existing hardscape. Provide a letter confirming that these hardscapes have been power washed to restore reflectivity close to original value. //
8. Statement indicating that adhesives and sealants do not contain carcinogen or reproductive toxicant components present at more than 1 percent of total mass as defined in the California Office of Environmental Health Hazard Assessment's (OEHHA) list entitled "Chemicals Known to the State to Cause Cancer" or the Reproductive Toxicity, Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65).

SPEC WRITER NOTE:

1. Omit the following if IEQc4 Group 5 Low-Emitting Materials: Exterior Applied Products is not being pursued.
9. // Statement indicating that roofing installations do not use hot-mopped asphalt installation techniques.
10. Statement indicating that no coal tar sealants were used for parking lots or other paved surfaces. //

1.5 APPLICABLE PUBLICATIONS

- A. LEED 2009 for Healthcare New Construction and Major Renovations Rating System.
- B. LEED Reference Guide for Green Building Design and Construction - Healthcare Supplement, 2009 Edition.
- C. Forest Stewardship Council Principles and Criteria for Forest Stewardship (FSC STD-01-001).
- D. 2003 EPA Construction General Permit.
- E. EPA's "Compendium of Methods for the Determination of Air Pollutants in Indoor Air".

- 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. South Coast Air Quality Management District (SCAQMD) Rule 1168, July 1, 2005 and rule amendment date of January 7, 2005.
- H. California Air Resources Board (CARB) 2007 Suggested Control Measure (SCM) for Architectural Coatings.
- I. California Office of Environmental Health Hazard Assessment (OEHHA) list "Chemicals Known to the State to Cause Cancer".
- J. Reproductive Toxicity, Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65).
- K. California AB1953 standard.
- L. British Standard (BS 5228).
- M. 2010 FGI Guidelines for Design and Construction of Health Care Facilities.
- N. Joint Commission standards.
- O. Infection Control Risk Assessment (ICRA).
- P. NIOSH's Asphalt Fume Exposures during the Application of Hot Application to Roofs (Publication No. 2003-112).
- Q. ASTM B828 and ASTM B813.
- R. 2002 National Electric Code.

PART 2 - PRODUCTS

2.1 PERFORMANCE CRITERIA

- A. Sustainably Sourced Materials and Products: Not less than [10] [20] [30] [40] percent of the value of building material content and products (by cost) must be sustainably sourced. The value of materials and products which meet any of the following criteria are considered sustainably sourced:
 1. Salvaged, refurbished, or reused materials.
 2. Recycled Content: Cost of post-consumer recycled content plus one-half of pre-consumer recycled content of an item must be determined by dividing weight of post-consumer recycled content plus one-half of pre-consumer recycled content in the item by total weight of the item and multiplying by cost of the item.
 3. Regional Materials.
 4. Rapidly Renewable.

5. Wood products which are FSC Certified.
6. Do not include [furniture,] plumbing, mechanical and electrical components, and specialty items such as elevators and equipment in the calculation.

SPEC WRITER NOTE:

1. Omit the following if MRC4.2 PBT Source Reduction: Lead, Cadmium, and Copper is not being pursued.

B. // Meet the following requirements for PBT Source Reduction: Lead, Cadmium and Copper:

1. Solder and flux used to connect piping for water for human consumption must be lead-free as defined by the California AB1953 standard.
2. Copper piping, pipe fittings, and faucets must be lead-free as defined by the California AB1953 standard.
3. Copper pipe included in the scope of Project must either have joints that are mechanically crimped or connected with ASTM B828 and ASTM B813-compliant flux.
4. Roofing and flashing must be lead-free.
5. Interior and exterior paints must contain no lead and no cadmium.
6. Lead content of electrical wire and cable must be less than 300 ppm.

//

C. Low Pollutant-Emitting Materials additional requirements:

1. Adhesives and sealants must not contain carcinogen or reproductive toxicant components present at more than 1 percent of total mass as defined in the California Office of Environmental Health Hazard Assessment's (OEHHA) list entitled "Chemicals Known to the State to Cause Cancer" or the Reproductive Toxicity, Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65).
2. Ceiling tiles, including suspended acoustical tiles, and wall coverings must comply with the testing and product requirements of the 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 (CDPH/EHLB Standard Method v1.1).
3. Carpet and hard surface flooring installed in the building interior (excluding mineral-based finish flooring products such as tile, masonry, terrazzo, and cut stone without integral organic based coatings and sealants and unfinished/untreated solid wood flooring)

must meet the testing and product requirements of the 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 (CDPH/EHLB/M-500 Standard Method v1.1) modeled using the standard office building protocol parameters and certified as compliant by an independent third party.

4. Batt Insulation Products must not contain added formaldehyde, including urea formaldehyde, phenol formaldehyde, and urea-extended phenol formaldehyde.

SPEC WRITER NOTE:

1. Omit the following if IEQc4 Group 5 Low-Emitting Materials: Exterior Applied Products is not being pursued.
5. // Exterior Applied Products: Adhesives, sealants, coatings, roofing and waterproofing materials (defined as from the weatherproofing system out and applied on-site) must comply with VOC limits of the California Air Resources Board (CARB) 2007 Suggested Control Measure (SCM) for Architectural Coatings and South Coast Air Quality Management District (SCAQMD) Rule 1168 effective July 1, 2005:
 - a. Aluminum Roof Coatings: 400 g/L.
 - b. Basement Specialty Coatings: 400 g/L.
 - c. Concrete Curing Compounds: 350 g/L.
 - d. Concrete/Masonry Sealers: 100 g/L.
 - e. Driveway Sealers: 50 g/L.
 - f. Floor Coatings: 100 g/L.
 - g. Industrial Maintenance Coatings: 250 g/L.
 - h. Non flat Coatings: 100 g/L.
 - i. Non flat High Gloss: 150 g/L.
 - j. Primers, Sealants, and Undercoaters: 100 g/L.
 - k. Quick Dry Enamels: 150 g/L.
 - l. Reactive Penetrating Sealer: 350 g/L.
 - m. Rust Preventative Coatings: 250 g/L.
 - n. Stains: 250 g/L.
 - o. Stone Consolidant: 450 g/L.
 - p. Traffic Coatings: 100 g/L.
 - q. Waterproofing Membranes: 250 g/L.
 - r. Wood Coatings: 275 g/L.
 - s. Outdoor Carpet Adhesives: 150 g/L.

- t. Wood Flooring Adhesives: 100 g/L.
 - u. Rubber Floor Adhesives: 60 g/L.
 - v. Ceramic Tile Adhesives: 65 g/L.
 - w. Dry Wall and Panel Adhesives: 50 g/L.
 - x. Cove Base Adhesives: 50 g/L.
 - y. Multipurpose Construction Adhesives: 70 g/L.
 - z. Structural Glazing Adhesives: 100 g/L.
 - aa. Single Ply Roof Membrane Adhesives: 250 g/L.
 - bb. Structural Wood Member Adhesives: 140 g/L.
 - cc. PVC Welding Adhesives: 510 g/L.
 - dd. CPVC Welding Adhesives: 490 g/L.
 - ee. ABS Welding Adhesives: 325 g/L.
 - ff. Plastic Cement Welding Adhesives: 250 g/L.
 - gg. Adhesive Primer for Plastic: 550 g/L.
 - hh. Contact Adhesive: 80 g/L.
 - ii. Special Purpose Contact Adhesive: 250 g/L.
 - jj. Adhesive Primer for Traffic Marking Tape: 150 g/L.
 - kk. Structural Wood Member Adhesive: 140 g/L.
 - ll. Sheet Applied Rubber Lining Operations: 850 g/L. //
6. Roofing installations must not use hot-mopped asphalt installation techniques.
 7. Parking lots and other paved surfaces must not use coal tar sealants.
 8. For any waterproofing, asphalt roofing needing repair, parking lot sealing or other high VOC emissions outdoor construction process, create a plan to manage fumes and avoid infiltration to occupied spaces. Comply with procedures established by NIOSH's Asphalt Fume Exposures During the Application of Hot Application to Roofs (Publication No. 2003-112).

PART 3 - EXECUTION

3.1 SPECIAL REQUIREMENTS

- A. Construction Indoor Air Quality Management additional requirements:
 1. Immediately remove from site and properly dispose of any materials susceptible to microbial growth and replace with new, undamaged materials. Protect the building from moisture intrusion and occupant exposures to dangerous mold spores.

SPEC WRITER NOTE:

1. The following item is relevant for an occupied healthcare facility

undergoing renovation, an addition adjacent to occupied healthcare facilities, or new construction with phased occupancy.

2. // Use the Infection Control Risk Assessment (ICRA) standards as a guideline for construction activities to assess risk and select mitigation procedures. //
3. Store fuels, solvents, and other sources of VOCs separately from absorbent materials.
4. Prohibit smoking inside the building and within 50 feet of the building entrance during construction.
5. Schedule construction procedures to minimize exposure of absorbent materials to VOC emissions. Schedule completing "wet" procedures such as painting and sealing before storing or installing "dry" absorbent materials such as carpet or ceiling tiles.
6. Reduce noise emissions and vibrations from construction equipment and other non-road engines by using equipment with low-noise emission design or the lowest decibel level available that meets performance requirements in the British Standard (BS 5228).
7. Construction crews must wear ear protection in areas where sound levels exceeded 85 dB for extended periods of time.

SPEC WRITER NOTE:

1. For the LEED credit IEQc3.2, 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.
8. 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 USGBC's "Green Building Design and Construction Reference Guide."
 - b. Demonstrate that the contaminant maximum concentrations listed below are not exceeded:
 - 1) Formaldehyde: 27 ppb.
 - 2) Particulates (PM10): 50 micrograms/cu. m.
 - 3) Total Volatile Organic Compounds (TVOC): 500 micrograms/cu. m.
 - 4) 4-Phenylcyclohexene (4-PH): 6.5 micrograms/cu. m.

- 5) 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 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 HC v3 Project Checklist

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