

SECTION 01 81 13 - SUSTAINABLE DESIGN REQUIREMENTS - LEED V4 & V4.1**PART 1 GENERAL****1.1 SUMMARY**

- A. Section includes general requirements and procedures for compliance with USGBC's LEED prerequisites and credits needed for Project to obtain **LEED Silver** certification based on USGBC's "LEED v4 / v4.1 for Building Design and Construction/Schools" (hereafter, LEED v4 / v4.1 BD+C/SCHOOLS).
1. Specific requirements for LEED are also included in other Sections.
 2. Other LEED prerequisites and credits needed to obtain LEED certification depend on product selections and may not be specifically identified as LEED requirements. Compliance with requirements needed to obtain LEED prerequisites and credits may be used as one criterion to evaluate substitution requests and comparable product requests.
 3. A copy of LEED Project checklist is attached at end of this Section for information only.
 - a. Some LEED prerequisites and credits needed to obtain indicated LEED certification depend on Architect's design and other aspects of Project that are not part of the Work of the Contract.
- B. General requirements for sustainable design reporting.
1. This project intends to be constructed using procedures and documentation complying with LEED V4 & V4.1 BD&C-SCHOOLS.

1.2 ADMINISTRATIVE AND REPORTING REQUIREMENTS

- A. Respond to questions and requests from Architect about USGBC's LEED prerequisites and credits that are Contractor's responsibility, that depend on product selection or product qualities, or that depend on Contractor's procedures, until USGBC has made its determination on Project's LEED certification application.
- B. A Sustainable Design Consultant has been employed by Architect to review Contractor's required sustainability certification documentation submittals, in addition to review of those submittals by Architect.
- C. ALL Contractors must familiarize themselves with the relevant reporting requirements and provide the necessary information and instruction to all subcontractors and installers.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site. Review sustainability goals, municipal and state sustainability requirements, LEED objectives, and action plans for meeting requirements.

1.4 RELATED REQUIREMENTS

- A. Section 01 74 19 – Construction Waste Management and Disposal.
- B. Section 01 81 19 – LEED Indoor Air Quality Management

1.5 DEFINITIONS

- A. BUG Rating Method: The BUG rating of a fixture determines how much light trespass is produced by considering Backlight (B), Uplight (U), and Glare (G).
- B. 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. Certificates to include evidence that manufacturer is certified for chain of custody by an FSC-accredited certification body.
- C. Cradle to Cradle: Product certification assessing material health, material reutilization, renewable energy and carbon management, water stewardship, and social fairness.
- D. Declare: A product transparency disclosure that identifies material source, composition, and end-of-life procedures.
- E. Environmental Product Declaration (EPD): A transparency reporting tool communicating what a product is made of and the environmental impact.
- F. Extended Producer Responsibility: A waste management strategy promoting integration of the life-cycle costs associated with goods into the market price of products. Typically, this involves a take-back or recycling program run by manufacturer at the end of the product's lifespan.
- G. Health Product Declaration (HPD): Disclosure of products contents and associated health information.
- H. Indoor Air Quality (IAQ) Management Plan: Plan developed by the Contractor to provide a healthy indoor environment for workers and building occupants during construction. Plan must meet or exceed the recommendations of SMACNA (OCC) 'IAQ Guidelines for Occupied Buildings Under Construction'. See Section Indoor Air Quality Management for additional IAQ Requirements of the Project.
- I. Living Product Challenge: A product framework for manufacturers examining place, water, energy, health, materials, and equity in production of materials.
- J. Material Cost: The dollar value of materials being provided to the Project, after Contractor mark-ups, including transportation costs, taxes, fees, and shop labor, but EXCLUDING field equipment and field labor costs.
- K. Manufacturer Inventory: A published, complete content inventory for products.
- L. Product Lens: Transparency disclosure highlighting hazard information.
- M. Recycled Content: The recycled content value of a material assembly to be determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.

1. "Postconsumer" material is defined as waste material generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product, which can no longer be used for its intended purpose.
 2. "Pre-consumer" material is defined as material diverted from the waste stream during the manufacturing process. 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) is excluded.
- N. Regional Materials: Materials that have been extracted, harvested, or recovered, as well as manufactured, within 100 miles 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) contributes to the regional value.
- O. Solar Reflectance Index (SRI): The measure of a constructed surface's ability to stay cool in the sun by reflecting solar radiation and emitting thermal radiation. SRI values range from zero (solid black surface) to 100 (solid white surface). SRI value of a material is calculated according to ASTM E1980 and based on the aged tested values of solar reflectance and thermal emittance.
- P. Vertical Illuminance: Illuminance levels calculated at a point on a vertical surface or plane.
- Q. WaterSense Label: The WaterSense label from the EPA specifies water efficiency and performance.
- R. Whole-Building Life-Cycle Assessment: The Life Cycle Assessment (LCA) is a methodology that evaluates the carbon and other environmental impacts of building materials over the projected lifespan of the building.

1.6 PRODUCT REPORTING SCOPE

- A. General: Product reporting scope for the purpose of achieving the selected sustainability certification level is limited to those items directly affecting ability to achieve targeted credits. See Part 1.7 Submittals for detailed submittal and documentation requirements. See Project LEED Checklist at end of this section for complete list of all credits anticipated for this Project.
- B. LEED Product Reporting Scope (for MR and EQ Credits): Will include any of the products specified in Divisions 2 through 10, 31, 32, and the following:
1. All paints, coatings, adhesives, and sealants that are used but not specified.
 2. All Flooring and associated adhesives that are used but not specified.
 3. All Composite wood that is permanently installed but not specified; and associated adhesives that are used but not specified.
 4. Plumbing and HVAC pipe insulation and associated adhesives that are used but not specified.
 5. Plumbing fixtures and associated adhesives that are used but not specified.
- C. LEED Product Reporting Scope (for EQ Credit only): May include any of the products in the following product categories, whether specified or not. Refer to Project LEED Checklist for Specific Category Criteria from the list below for credit EQ2 Low Emitting Materials. See project specific credit Checklist for breakdown of required criteria.

1. Interior paints and coatings.
2. Interior adhesives and sealants, including flooring adhesives.
3. Flooring.
4. Composite wood.
5. Ceilings.
6. Walls.
7. Insulation.

1.7 REFERENCE STANDARDS

- A. BIFMA e3 - Furniture Sustainability Standard; Business and Institutional Furniture Manufacturers Association 2019.
- B. C2C (DIR) - C2C Certified Products Registry; Cradle to Cradle Products Innovation Institute Current Edition.
- C. GreenScreen (METH) - GreenScreen for Safer Chemicals Method v1.2; Clean Production Action Current Edition.
- D. HPDC (HPD-OLT) - Create an HPD On-Line Tool; Health Product Declaration Collaborative Current Edition.
- E. ILFI (DEC) - International Living Future Institute 'Declare' Program 2017.
- F. SMACNA (OCC) - IAQ Guidelines for Occupied Buildings Under Construction 2007.
- G. USGBC LEED v4-BD+C - LEED v4 for Building Design and Construction 2019.

1.8 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for additional submittal procedures requirements.
- B. General: Submit sustainable design submittals required by other Sections and throughout this Section.
- C. Sustainable design submittals are in addition to other submittals.
 1. If submitted item is identical to that submitted to comply with other requirements, include additional copy with other submittal as a record of compliance with indicated LEED requirements instead of separate sustainable design submittal. Mark additional copy "LEED Submittal."
- D. Project Materials Cost Data: Provide Schedule Of Values (SOV) indicating total cost for Materials & Labor broken out separately, used for Project. Include breakout of costs for the following categories of items:
 1. Complete Project SOV for ALL Divisions
 2. Accurate Material Only Cost (including markup, shipping, tax, etc....as charged to the project) information on all LEED Submittals
- E. Sustainable Design Action Plans: Provide preliminary submittals within 30 days of date established for commencement of the Work , indicating how the following requirements will be met:

1. List of proposed products with EPDs.
 2. List of proposed products complying with requirements for multi-attribute optimization.
 3. List of proposed products complying with requirements for sourcing of raw materials (i.e. Recycled Content).
 4. List of proposed products complying with requirements for material ingredient reporting.
 5. List of proposed products complying with requirements for material ingredient optimization.
 6. Waste management plan complying with Section 01 74 19 "Construction Waste Management and Disposal."
 7. Construction IAQ management plan.
 8. IAQ Management & Assessment plan.
 9. Complete VOC Logs for EVERY Contractor and Subcontractor. All Divisions, No Exceptions Taken.
- F. Sustainable Design Progress Reports: Concurrent with each Application for Payment, submit reports comparing actual construction and purchasing activities with sustainable design action plans.
1. Submit working BPDO Tracking Spreadsheet/Calculator with current cost/count/percentage of products that meet BPDO requirements for MR2 (EPD's), MR3 (Sourcing of Raw Materials) & MR4 (Material Ingredients).
 2. Submit working Low Emitting Materials Spreadsheet/Calculator with accurate list of every Adhesive, Sealant, Paint, Coating, Wall Panel, Ceiling, Insulation, Flooring and Composite Wood material used or planned for use on the project.
 - a. No Adhesive, Sealant, Paint, Coating, Wall Panel, Ceiling, Insulation, Flooring or Composite Wood material/product may be used on the project without prior LEED Review and Approval.
- G. QUALITY ASSURANCE
- H. LEED Coordinator: Engage an experienced LEED AP or LEED Green Associate to coordinate LEED requirements. LEED coordinator may also serve as waste management coordinator.
- I. Summary of Key Sustainable Design Documentation Submittals:
1. Plumbing submittal packages showing all Flush and Flow rates AND WaterSense certifications for applicable fixtures. All fixtures to be Low Flow. Toilet & Urinal Flushvalves, Showerheads and
 2. Product Data and certification for WaterSense-labeled water fixtures.
 3. Mechanical submittal packages showing compliance with various LEED criteria.
 4. EPDs complying with LEED requirements.
 5. Documentation for products that comply with LEED requirements for Multi-Attribute Optimization/Embodied Carbon/LCA Optimization.
 6. Sustainability reports for products that comply with LEED requirements for sourcing of raw materials (i.e. Recycled Content).

7. Material ingredient reports for products that comply with LEED requirements for material ingredient reporting.
 8. Documentation for products that comply with LEED requirements for material ingredient optimization.
 9. Documentation complying with Section 01 74 19 "Construction Waste Management and Disposal."
 10. Product data for ALL adhesives and sealants used inside the weatherproofing system, indicating VOC content and laboratory test reports showing compliance with requirements for low-emitting materials.
 11. Product data for paints and coatings used inside the weatherproofing system, indicating VOC content and laboratory test reports showing compliance with requirements for low-emitting materials.
 12. Laboratory test reports for flooring, indicating compliance with requirements for low-emitting materials.
 13. Laboratory test reports for products containing composite wood or agrifiber products or wood glues, indicating compliance with requirements for low-emitting materials.
 14. Acoustical documentation for classroom materials showing an NRC of 0.70 or higher Ceiling Tile, Acoustic Deck, etc. for 100% of Ceiling area in ALL Classroom and Core Learning Spaces. (Applicable on all LEED Schools projects and see project Checklist for credit Enhanced Acoustics for all other projects types)
 15. Documentation for luminaires indicating BUG ratings, lumens emitted, and vertical illuminance values.
 16. Documentation for compliant paving materials indicating the SRI/SR.
 17. Documentation for compliant roofing materials indicating the SRI.
 18. Construction Indoor Air Quality (IAQ) Management:
 - a. Construction IAQ management plan.
 - b. Product data for temporary filtration media.
 - c. Product data for filtration media used during occupancy if applicable.
 - d. Construction Documentation: Fifteen (15) photographs at three different times during construction period, along with a brief description of SMACNA approach employed, documenting implementation of IAQ management measures, including protection of ducts and additional photos of on-site stored or installed absorptive materials.
- J. IAQ Assessment:
1. Signed statement describing the building air flush-out procedures, Total Volume of Outside Air delivered, Trend Logs from BAS confirming O.A., including dates when flush-out was begun and

- completed and statement that filtration media was replaced after flush-out (if Flushout is opted for).
2. Product data for filtration media used during flush-out and occupancy.
 3. Report from testing and inspecting agency indicating results of IAQ testing and documentation showing compliance with IAQ testing procedures and requirements.
- K. Sustainable Design Documentation: The scope of required documentation is specified in this section and in applicable individual specification sections. Refer to Project LEED Checklist for most current LEED anticipated credits.
- L. LEED v4 & 4.1 Prerequisites and Credits - Documentation is required for the following items. Refer to LEED Checklist at end of this Section for complete list of anticipated credits.:
1. Location and Transportation:
 - a. LT6 – Bicycle Facilities
 - 1) Submit cutsheets of Bike Racks complying with LEED Requirements.
 - b. LT8 – Green Vehicles
 - 1) Submit cutsheets of Level 2 EV Charging Stations complying with LEED Requirements.
 2. Sustainable Sites
 - a. SSp1 – Construction Activity Pollution Prevention
 - 1) Submit SWPPP Inspection Report Samples from multiple timeframes throughout the projects construction. A minimum sampling of 9+ reports are required for review and possible upload to LEED Online to confirm that all requirements have been met.
 - b. SS6 - Light Pollution Reduction
 - 1) Submit B.U.G. Lighting information and cutsheets for ALL Exterior light fixtures installed on the project.
 3. Water Efficiency
 - a. WEp2 & WE2 - Indoor Water Use Reduction
 - 1) Submit cutsheets for all Flush and Flow fixtures installed on the project showing Flush and Flow rates (gpf/gpm) for each fixture AND the required WaterSense certification label for all Toilet / Urinal Flush valves & Showerheads.
 - b. WE4 – Water Metering
 - 1) Submit cutsheets for all Water Sub-Meters installed on the project at locations identified in Mechanical and Plumbing drawings and specs.
 4. Energy and Atmosphere

- a. EA6 – Enhanced Refrigerant Management
 - 1) Submit cutsheets and complete submittal package for all Refrigerant containing equipment (HVAC, Kitchen Equipment, etc.).
5. Materials and Resources
 - 1) Use the Building Product Disclosure and Optimization (BPDO) Calculator spreadsheet software available from USGBC to track and document materials and products purchases and use. Use for documentation of USGBC LEED v4-BD+C MR Credits.
 - 2) Provide products and procedures necessary to obtain LEED credits indicated as Contractor's responsibility. Although other Sections may specify some requirements that contribute to these LEED credits, Contractor provides additional materials and procedures necessary to obtain LEED credits indicated.
- b. MRp1 - Storage & Collection of Recyclables
 - 1) Submit cutsheets of all Office Recycle bins, Recycle Stations and Large Scale Recycle Centers provided on the project.
- c. MR2 - Building Product Disclosure and Optimization - Environmental Product Declarations (EPD's). V4.1 Criteria Required.
 - 1) Submit Environmental Product Declarations (EPD's) complying with LEED reporting requirements.
 - a) Submit for at least **FORTY (40)** permanently installed products, sourced from at least **Five (5)** different manufacturers.
 - 1) Product-specific Type III EPDs are valued as one and one-half (1.5) of a product. Industry Wide (Generic) EPDs shall be valued as one (1) product and the Manufacturer must be listed as a Participating Company on the EPD to comply.
 - 2) Submit Environmental Product Declarations (EPD's) complying with LEED reporting requirements for Embodied Carbon / LCA Optimization.
 - a) Submit for at least **FIVE (5)** permanently installed products, sourced from at least **Three (3)** different manufacturers .
- d. MR3 - Building Product Disclosure and Optimization - Sourcing of Raw Materials. V4.1 Criteria Required.
 - 1) Submit Recycled Content data complying with LEED reporting requirements.
 - a) Building materials have recycled content such that postconsumer recycled content plus one-half of pre-consumer recycled content for Project constitutes a **Minimum of 30 Percent (30%) (2 points)** of cost of materials used for the Project.

- 1 Cost of postconsumer recycled content plus one-half of pre-consumer recycled content of an item to be determined by dividing weight of postconsumer 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.
 - 2 If product is Extracted, Manufactured & Sourced within 100 miles of Project site, material cost can be doubled in the BPDO Calculator such that the material contributes up to 200% of the product cost.
 - 3 Do not include furniture, plumbing, mechanical and electrical components, and specialty items, such as elevators and equipment, in the calculation.
 - 4 Only products in Divisions 2-10, 31 & 32 are required to submit Recycled Content and Regional Information.
- e. MR4 - Building Product Disclosure and Optimization - Material Ingredients. V4.1 Criteria Required.
- 1) Material Ingredient Reporting: Submit Material Ingredient Reports complying with LEED reporting requirements for BOTH Option 1 and Option 2.
 - a) Option 1 - Submit at least **FORTY (40)** permanently installed products, sourced from at least **Five (5)** different manufacturers that comply with - Material Ingredient Reporting.
 - b) Option 2 - Submit at least **FIVE (5)** permanently installed products, sourced from at least **Three (3)** different manufacturers that comply with - Material Ingredient Optimization:
 - 1 Use the following, as is appropriate to locate documents necessary for Options 1 and 2:
 - 2 GBCI Database: Better Materials - <https://bettermaterials.gbci.org/>
 - 3 GreenScreen - v1.2 Benchmark reports.
 - 4 Manufacturers' inventories of ingredients.
 - 5 HPDC (HPD-OLT) Health Product Declarations.
 - 6 C2C (DIR) Cradle-to-Cradle certifications.
 - 7 C2C (DIR) Cradle-to-Cradle Material Health certifications.
 - 8 ILFI (DEC) 'Declare' product labels.
 - 9 C2C (DIR)Cradle-to-Cradle certifications.
 - 10 Other USGBC approved program.
- f. MR5 - Construction & Demolition Waste Management. V4 Criteria Required.
- 1) See Section 017419 Construction & Demolition Waste Management and Disposal for detailed LEED Requirements.
 - a) Submit a Construction & Demolition Waste Management Plan complying with LEED reporting requirements **Thirty (30)** days prior to Commencement of Work for a **Minimum 75 percent (75%)** Diversion and a **Minimum of 5 Material Streams**.

- b) Submit Monthly reports quantifying diversion of construction and demolition waste showing total Quantities in Cubic Yards of Waste Recycled versus Landfilled/Incinerated.
 - c) Submit a **Final Report** quantifying diversion of construction and demolition waste showing a **Minimum 75 percent (75%+)** total Waste Recycled / Diverted from Landfill/Incineration from a **Minimum of 5 Material Streams**.
6. Indoor Environmental Quality
- a. EQp2 – No Smoking
 - 1) Smoking is not permitted within the building or within 25 ft. of entrances, operable windows, or outdoor-air intakes or on ANY SCHOOL GROUNDS.
 - b. EQ1 - Enhanced IAQ Strategies
 - 1) Submit cutsheets for all Integrated or Roll Out Walk Off Systems installed at building entry points.
 - 2) Submit Filtration Media cutsheets showing MERV 13 minimum at all Outdoor and Return Air filter locations.
 - c. EQ2 - Low-emitting Materials
 - 1) Use the Low-Emitting Materials Calculator spreadsheet software (available from USGBC) to track and document the following categories in compliance with all documentation requirements of USGBC LEED v4 & v4.1 BD+C Credits:
 - a) Interior paints and coatings applied on site:
 - 1 For field applications, 75 percent of paints and coatings meet the VOC emissions evaluation and 100 percent meet the VOC content (g/L) evaluations (table of VOC Content limits below). *For projects in North America, methylene chloride and perchloroethylene may not be intentionally added in paints or coatings.
 - 2 Submit General Emissions Evaluation for Each unique product used.
 - 3 Submit VOC content data for all wet applied products.
 - 4 Submit Total Volume (gallons/liters/tubes/etc) of each wet applied product used on site.
 - 5 Submit using the “Low Emitting Materials Reporting Form” at end of this Section.
 - b) Interior adhesives and sealants applied on site (including flooring adhesives):
 - 1 For field applications, 75 percent of adhesives and sealants meet the VOC emissions evaluation and 100 percent meet the VOC content (g/L) evaluations (table of VOC Content limits below).
 - 2 Submit General Emissions Evaluation for Each unique product used.
 - 3 Submit VOC content requirements for all wet applied products.

- 4 Submit Total Volume (gallons/liters/tubes/etc) of each wet applied product used on site.
- 5 Submit using the “Low Emitting Materials Reporting Form” at end of this Section.

c) Flooring:

- 1 A minimum of 90 percent of flooring products meet the VOC emissions evaluation or inherently non-emitting sources* criteria. The flooring product 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. Subflooring is excluded, but documented in the Composite Wood category.
- 2 *Inherently non-emitting sources - Products that are inherently non-emitting sources of VOCs are: 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.
- 3 For the purposes of this credit, untreated and unfinished solid wood (not engineered wood) can also be considered non-emitting even though such materials will likely emit some amount of formaldehyde naturally.
- 4 Submit General Emissions Evaluation information for all flooring materials.
- 5 Submit VOC content requirements for all wet applied flooring adhesives.
- 6 Submit Total Volume (gallons/liters/tubes/etc) of each wet applied product used on site.
- 7 Submit using the “Low Emitting Materials Reporting Form” at end of this Section.

d) Composite wood:

- 1 A minimum of 75 percent of all composite wood meet the Formaldehyde emissions evaluation or salvaged and reused materials criteria. Composite wood materials include particleboard, MDF, hardwood veneer plywood, and structural composite wood. Submit composite wood evaluation information for all materials not covered by another product category.
- 2 Submit VOC content requirements for all wet applied adhesives.
- 3 Submit Total Volume (gallons/liters/tubes/etc) of each wet applied product used on site.
- 4 Submit using the “Low Emitting Materials Reporting Form” at end of this Section.

d. EQ3 - Construction Indoor Air Quality Management Plan

- 1) See Section 018119 Indoor Air Quality for detailed LEED Requirements.

- a) Comply with SMACNA's "SMACNA IAQ Guideline for Occupied Buildings under Construction."
 - b) If Owner authorizes use of permanent heating, cooling, and ventilating systems during construction period as specified in Section 01 50 00 "Temporary Facilities and Controls," install MERV 8 filter media at each return-air inlet for the air-handling system used during construction. Air Filter Change Logs, Dated Photos, Cutsheets of Temporary and Permanent Filtration Media are required if system is used at any time During Construction and at all times, after system startup, testing and balancing.
 - c) Replace air filters immediately prior to occupancy with new filters specified in Section 23 41 00 "Particulate Air Filtration." MERV 13 Minimum.
 - d) Submit an **Indoor Air Quality Management Plan** complying with all LEED requirements **Thirty (30)** days prior to Commencement of Work.
 - e) Submit Dated Photos showing implemented IAQ Measures complying with LEED Requirements throughout the duration of construction. A minimum of 30 photos from various phases of construction:
 - 1 Photos of Sealed and Protected Ductwork
 - 2 Photos of Protected Mechanical, Electrical and Lighting Equipment
 - 3 Photos of Protected Storage of Dry Absorptive Materials (Drywall, Ceiling Tile, Insulation, Flooring, etc...) Stored On Site
- e. EQ4 - Indoor Air Quality Assessment - V4.1 Criteria Testing Required
- 1) See Section 018119 Indoor Air Quality for additional information.
 - 2) Flush-Out: Project will achieve IAQ Assessment via Air-Quality Testing, below. Flushout is not required, however it is advisable to run a mini-flushout of the building with all systems set to a high percentage up to 100% Outdoor Air and maintain at least 60 deg F and a relative humidity no higher than 60 percent for a minimum of 2-3+ days PRIOR to the arrival of the Air Quality Testing Agency performing the Tests to purge the building of any existing contaminants and increase likelihood of passing all IAQ Test criteria.
 - 3) Air-Quality Testing: CM/CMR will engage testing agency to perform the following:
 - a) Conduct baseline IAQ 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 USGBC's "LEED v4.1 Reference Guide for Building Design and Construction."
 - b) Demonstrate that contaminant maximum concentrations listed in both tables below are not exceeded:

Table 1. Particulate Matter and Inorganic Gases

Contaminant (CAS#)	Concentration Limit ($\mu\text{g}/\text{m}^3$)	Allowed Test Methods
Carbon monoxide (CO)	9 ppm; no more than 2 ppm above outdoor levels	ISO 4224 EPA Compendium Method IP-3 GB/T 18883-2002 for projects in China Direct calibrated electrochemical instrument with accuracy of (+/- 3% of reading and resolution of 0.1 ppm). NDIR CO Sensors with accuracy of 1% of 10 ppm full scale and display resolution of less than 0.1ppm
PM 10	ISO 14644-1:2015, cleanroom class of 8 or lower 50 $\mu\text{g}/\text{m}^3$ Healthcare only: 20 $\mu\text{g}/\text{m}^3$	Particulate monitoring device with accuracy greater of 5 micrograms/ m^3 or 20% of reading and resolution (5 min average data) +/- 5 $\mu\text{g}/\text{m}^3$
PM 2.5**	12 $\mu\text{g}/\text{m}^3$ or 35 $\mu\text{g}/\text{m}^3$ **	
Ozone	0.07 ppm	Monitoring device with accuracy greater of 5 ppb or 20% of reading and resolution (5 min average data) +/- 5 ppb ISO 13964 ASTM D5149 — 02 EPA designated methods for Ozone

**Projects in areas with high ambient levels of PM2.5 (known EPA nonattainment areas for PM2.5, or local equivalent) must meet the 35 $\mu\text{g}/\text{m}^3$ limit, all other projects should meet the 12 $\mu\text{g}/\text{m}^3$ limit.

Table 2. Volatile Organic Compounds

Contaminant (CAS#)	Concentration Limit ($\mu\text{g}/\text{m}^3$)	Allowed Test Methods
Formaldehyde 50-00-0	20 $\mu\text{g}/\text{m}^3$ (16 ppb)	ISO 16000-3, 4; EPA TO-11a, EPA comp. IP-6 ASTM D5197-16
Acetaldehyde 75-07-0	140 $\mu\text{g}/\text{m}^3$	
Benzene 71-43-2	3 $\mu\text{g}/\text{m}^3$	ISO 16000-6 EPA IP-1, EPA TO-17, EPA TO-15 ISO 16017-1, 2; ASTM D6196-15
Hexane (n-) 110-54-3	7000 $\mu\text{g}/\text{m}^3$	
Naphthalene 91-20-3	9 $\mu\text{g}/\text{m}^3$	
Phenol 108-95-2	200 $\mu\text{g}/\text{m}^3$	
Styrene 100-42-5	900 $\mu\text{g}/\text{m}^3$	
Tetrachloroethylene 127-18-4	35 $\mu\text{g}/\text{m}^3$	
Toluene 108-88-3	300 $\mu\text{g}/\text{m}^3$	
Vinyl acetate 108-05-4	200 $\mu\text{g}/\text{m}^3$	
Dichlorobenzene (1,4-) 106-46-7	800 $\mu\text{g}/\text{m}^3$	

Xylenes-total 108-38-3, 95-47-6, and 106-42-3	700 µg/m ³	
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- c) For each sampling point where the maximum concentration limits above are exceeded, take corrective action and retest for the non-compliant contaminants until requirements have been met.
- d) Consolidate all Test Results into Final Submission showing compliance with all Contaminants as required per LEED criteria.
- e) Air-sample testing to be conducted as follows:
 - 1 All measurements to 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 the minimum outside airflow rate for the occupied mode throughout the duration of the air testing.
 - 2 Building to have All interior finishes, such as millwork, doors, paint, carpet, acoustic tiles, and movable furnishings (e.g., workstations, partitions), must be installed, and major VOC punch list items must be finished.
 - 3 Number of sampling locations varies depending on the size of building and number of ventilation systems. Testing Agency shall provide a list of locations based on project floorplans, HVAC design and LEED Requirements. For each portion of building served by a separate ventilation system, the number of sampling points to not be less than one per 5000 sq. ft. For large open spaces, one sampling point per 50,000 sq. ft. may be used.
 - 4 Air samples to be collected between 3 and 6 ft. from the floor to represent the breathing zone of occupants, and over a minimum four-hour period.
 - 5 **Air Testing Agency to Confirm all testing criteria, limits and testing location requirements with most current LEED Addenda prior to completing on site tests.
- f. EQp3 Minimum Acoustic Performance (LEED Schools) / EQ9 Acoustic Performance, if applicable, for all other LEED Rating systems (See Project Specific LEED Checklist) -
 - 1) Submit cutsheets for all Ceiling Materials (Acoustic Ceiling Tile, Acoustic Deck, etc.) in all Classrooms and Core Learning Spaces for Schools and in all Regularly Occupied Spaces for all other LEED Rating Systems, showing Noise Reduction Coefficient (NRC) of 0.70 or better for 100% of All Ceiling Area (excluding diffusers, lighting, equipment, etc.).

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION****3.1 PROCEDURES**

- A. Submit sustainable design documentation required of Contractor, using procedures defined under Submittals for Information in Section 01 30 00.
- B. Submit extra copy of sustainable design documentation to Architect for transmittal to Sustainable Design Consultant, unless otherwise indicated. LEED Submittals will say “LEED” in the Submittal Description.
- C. Where an item of sustainable design documentation is specified, fill out and submit electronically the appropriate form(s), and/or use appropriate software for submitting Progress Reports.
 - 1. Fill out one line for each different brand name product and each different manufacturer of a lot of commodity products.
 - 2. Where required attachments are specified, attach the documentation. In all cases LEED submittals **MUST** be submitted with Manufacturers Supporting Documentation of Sustainable Criteria.
- D. Each form must be signed by the entity capable of certifying the information.
 - 1. Certification signatures must be made by an officer of the company.
 - 2. For products, certification must be made by the manufacturer not the supplier.
 - 3. For custom fabricated products, certification by the fabricator is acceptable.
- E. Submit the completed forms in accordance with the requirements of Section 01 30 00, as information submittals.
 - 1. Give each form a unique submittal number. Include “LEED” in the name/description.
 - 2. Do not combine sustainable design documentation with shop drawing submittals.
- F. Submit forms applicable to work for which application for payment is being made, either prior to or concurrent with application for payment; payment will not be made until relevant forms have been submitted.
- G. For work covered by multiple applications for payment, the initial submittal of a form is sufficient for subsequent applications unless the nature of the product has changed.

END OF SECTION 01 81 13

Building Product Disclosure and Optimization Reporting Form - LEED V4[®]

Project:	Massillon – Westside PK-3	Date:
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Please provide one of this form for each item which is different, for example if "Hollow Metal Doors" are listed and two manufacturers were used, provide this form for each manufacturer of the item with separate material values and other information required below.

Contractor & Contact Phone #: _____

Item Supplied (Manuf. & Make/Model): _____

Applicable Spec Section #: _____

Material Only \$ Cost of Material (as Charged to Project including all markup, tax, freight, etc., everything except onsite labor cost): \$ _____

MR2 – BPDO Environmental Product Declarations

Are EPD sheets attached? YES or NO

EPD Program Operator (example: UL, ASTM, Manufacturer, etc.): _____

What type of EPD is it (circle one)? -Product Specific- -Industry-Wide Generic- -Product Specific Type III-

Does the EPD address Reductions in Embodied Carbon? YES or NO

MR3 – BPDO Sourcing of Raw Materials

• Recycled Content:

- » Post-Industrial/Pre-Consumer Recycled content of item: _____
- » Post-Consumer Recycled content of item: _____

• Regional Content Multiplier

- » Location of raw material Extraction & Mileage from Project Site: _____
- » Location of Manufacture & Mileage from Project Site: _____
- » Location of Purchase (including Distribution) & Mileage from Project Site: _____

MR4 – BPDO Material Ingredients

Material Ingredient Reporting is attached? YES or NO

Material Ingredient Report Type (circle one)? -Green Screen- -Globally Harmonized System- -Declare-
-Health Product Declaration- -Cradle to Cradle- -Other-

Contractor Signature: _____ Date: _____

I verify that the item listed above was used in the project & the information provided is accurate to the best of my knowledge.



Low Emitting Materials Reporting Form - LEED V4 ©

Project:	Massillon – Westside PK-3	Date:
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IT IS MANDATORY to provide one of these sheets for EVERY Adhesive, Sealant, Paint, Coating, Flooring, Ceilings, Walls, Thermal & Acoustic Insulation, Composite Wood within your scope of work. All Trades, All Divisions, NO EXCEPTIONS

Contractor & Contact Phone #: _____

Item Supplied (Manuf. & Make/Model): _____

Applicable Spec Section #: _____

Material Only \$ Cost of Material (as Charged to Project including all markup, tax, freight, etc., everything except onsite labor cost): \$ _____

Inherently Non-Emitting

Is the Material Inherently Non-Emitting: Stone, Ceramic, Powder-Coated Metals, Plated or Anodized Metals, Glass, Concrete, Clay, Brick, Unfinished or Untreated Solid Wood Flooring? YES or NO

General Emissions Evaluation - (ALL Paints & Coatings, Adhesives & Sealants, Flooring, Ceilings, Walls, Thermal & Acoustic Insulation)

Does the product meet the CDPH Standard Method V1.1-2010? YES or NO

CDPH certification backup attached? YES or NO

TVOC as shown on the provided Documentation: -0.5 mg/m³ or less- -between 0.5 and 5.0 mg/m³- -5.0 mg/m³ or more-

Interior Applied Paints & Coatings (CARB, SCAQMD Rule 1113)

VOC Contents in g/L for Paints & Coatings (attach MSDS/Data sheet): _____ g/L

VOC Limit in g/L for the Paints & Coating (see reference table): _____ g/L

Does product meet the requirements? YES or NO

Any Intentionally Added Methylene Chloride or Perchloroethylene? YES or NO *If YES product is banned from use.*

For Wet Applied Products – Total Volume (L) of Product Installed: _____

Interior Applied Adhesives & Sealants (SCAQMD 1168)

VOC Contents in g/L for Adhesives & Sealants (attach MSDS/Data sheet): _____ g/L

VOC Limit in g/L for the Adhesives & Sealants (see reference tables): _____ g/L

Does product meet the requirements? YES or NO

Any Intentionally Added Methylene Chloride or Perchloroethylene? YES or NO *If YES product is banned from use.*

For Wet Applied Products – Total Volume (L) of Product Installed: _____

Flooring

Does the product meet the VOC Emissions Evaluation OR Inherently Non-Emitting Sources exemption? YES or NO

Supporting backup documentation attached to confirm compliance? YES or NO

**Subflooring must be included in Composite Wood category.*

**Wet Applied Flooring must be included in Paints & Coatings category.*

Composite Wood

Does the product meet the TSCA or CARB ATCM for Ultra-Low Emitting Formaldehyde resins (ULEF)? YES or NO

Is the product Urea Formaldehyde Free or No Added Urea Formaldehyde (UFF or NAUF)? YES or NO

Supporting backup documentation attached to confirm compliance? YES or NO

Contractor Signature: _____ Date: _____

I verify that the item listed above was used in the project & the information provided is accurate to the best of my knowledge.



Low-Emitting Materials Reference Sheet - LEED V4 / 4.1

Paints & Coatings - Either CARB 2007 'OR' SCAQMD Rule 1113 whichever is more beneficial. Adhesives & Sealants - SCAQMD Rule 1168.

Paints & Coatings	CARB 2007	SCAQMD Rule 1113, Feb 5, 2016
	Max VOC (g/L)	
Basement specialty coatings	400	
Bond breakers	350	350
Colorant - Architectural coatings, excluding IM		50
Colorant - Solvent-based IM		600
Colorant - Waterborne IM		50
Concrete - Curing compounds	350	400
Concrete - Curing compounds - roads/bridges		350
Concrete/Masonry sealers	100	
Concrete surface retarder		50
Driveway sealer	50	50
Dry-fog coatings	150	50
Faux finishing coatings - Clear topcoat	350	400
Faux finishing coatings - Decorative coatings	350	350
Faux finishing coatings - Glazes	350	350
Faux finishing coatings - Japan	350	350
Faux finishing coatings - Trowel applied	350	50
Fire-proofing coatings		150
Fire resistive coatings	350	
Flats	50	50
Floor coatings	100	50
Form release compound	250	400
Graphic arts (sign) coatings	500	200
Industrial Maintenance (IM) coatings	250	400
IM coatings - color indicating safety		480
IM coatings - High temperature IM	420	420
IM coatings - Non-sacrificial anti-graffiti		100
IM coatings - Zinc-rich IM primers	340	100
Low solids coatings	120	120
Magnesite cement coatings	450	450
Mastic coatings/texture	100	100
Metallic pigmented coatings	500	450
Multi-Color coatings	250	250
Non-flat coatings	100	50
Non-flat coatings - High Gloss	150	
Pre-treatment wash primers	420	420
Primers, sealers, and undercoaters	100	100
Reactive penetrating sealers	350	350
Recycled coatings	250	250
Roof coatings	50	50
Roof coatings, aluminum	400	400
Roof coatings, bituminous	50	
Roof primers, bituminous	350	350
Rust preventative coatings	250	400
Sacrificial anti-graffiti coatings		50
Shellac - Clear	730	730
Shellac - Pigmented or Opaque	550	550
Specialty primers, sealers/undercoaters	100	100
Stains	250	400
Stone consolidants	450	450
Swimming pool coatings - Repair	340	340
Swimming pool coatings - Other	340	340
Tile and stone sealers		100
Traffic coatings	100	100
Tub and tile refinish coatings	420	420
Waterproofing membranes	250	
Waterproofing sealers		100
Waterproofing concrete/masonry sealers		100
Wood coatings - varnish	275	275
Wood coatings - sanding sealers	275	275
Wood coatings - lacquer	275	275
Wood conditioners		100
Wood preservatives	350	350

Adhesives & Sealants	SCAQMD Rule 1168, Oct 6, 2017
	Max VOC (g/L)
<u>Adhesives for Architectural Applications</u>	
Building envelope membrane adhesive	250
Carpet pad adhesives	50
Ceramic glass, porcelain, & stone tile adhesive	65
Cove base adhesives	50
Dry wall and panel adhesives	50
Multi-purpose construction adhesives	70
Roofing- single ply roof membrane adhesive	250
Roofing- all other roof adhesives	250
Rubber floor adhesives	60
Structural glazing adhesives	100
Structural wood member adhesive	140
Subfloor adhesive	50
VCT and asphalt tile adhesives	50
Wood flooring adhesive	100
All other indoor floor covering adhesives	50
All other outdoor floor covering adhesives	50
<u>Specialty Applications</u>	
Computer diskette manufacturing adhesive	350
Contact adhesive	80
Edge glue adhesive	250
ABS welding cement	325
ABS to PVC transition cement	510
CPVC welding cement	490
PVC welding cement	510
All other plastic cement welding cements	100
Rubber Vulcanization Adhesive	250
Special purpose contact adhesive	250
Thin metal laminating adhesive	780
Tire tread adhesive	100
Top and trim adhesive	250
Waterproof resorcinol glue	170
All other adhesives	250
<u>Substrate Specific Applications</u>	
Metal substrate-specific adhesives	30
Plastic foam substrate-specific adhesives	50
Porous material (except wood) adhesives	50
Wood substrate-specific adhesives	30
Fiberglass substrate-specific adhesives	80
Reinforced plastic composite adhesives	200
<u>Sealants for Architectural Applications</u>	
Clear, paintable, & immediately water-resistant sealant	250
Foam insulation	250
Grout	250
Roadway sealant	250
Non-staining plumbing putty	250
Potable water sealant	250
Roofing - single ply roof membrane sealant	450
Roofing - all other roof sealants	300
All other architectural sealants	50
Marine deck sealant	760
All other sealants	420
<u>Adhesive Primers</u>	
Plastic adhesive primers	550
Pressure sensitive adhesive primers	250
Traffic marking tape adhesive primers	150
Vehicle glass adhesive primers	250
All other adhesive primers	250
<u>Sealant Primers</u>	
Architectural non-porous sealant primer	250
Architectural porous sealant primer	775
Modified bituminous sealant primer	500
Marine deck sealant primer	760
All other sealant primers	750

Low-Emitting Materials Reporting Form KEY	
Interior Paints & Coatings	General emissions evaluation and VOC content
Interior Adhesives & Sealants	General emissions evaluation and VOC content
Flooring	General emissions evaluation or Inherently nonemitting
Composite Wood	Composite wood evaluation or Inherently nonemitting
Ceilings, Walls, Thermal & Acoustic Insulation	General emissions evaluation or Inherently nonemitting
Furniture	Furniture evaluation or Inherently nonemitting



ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

Project Name: **Massillon – Westside PK-3**

1.1 Use of This Form:

- A. Because installers are allowed and directed to choose accessory materials suitable for the applicable installation, there is a possibility that such accessory materials might contain VOC contents in excess of that permitted, especially where such materials have not been explicitly specified.
- B. Contractor is required to obtain and submit this form from each installer of work on this project.
- C. For each product category listed, circle the correct words in brackets: either [HAS] or [HAS NOT].
- D. If any of these accessory materials has been used, attach to this form product data and MSDS sheet for each such product FOR APPROVAL PRIOR TO USE.

1.2 VOC content restrictions are specified in Section 01 81 13.

1.3 PRODUCT CERTIFICATION

- A. I certify that the installation work of my firm on this project:
 - 1. [HAS] [HAS NOT] required the use of any ADHESIVES.
 - 2. [HAS] [HAS NOT] required the use of any SEALANTS.
 - 3. [HAS] [HAS NOT] required the use of any PAINTS OR COATINGS.
 - 4. [HAS] [HAS NOT] required the use of any COMPOSITE WOOD/AGRIFIBER PRODUCTS.
- B. Product data and MSDS sheets are attached for any line above marked [HAS].

1.4 CERTIFIED BY: (Installer/Manufacturer/Supplier Firm)

Firm Name: _____

Print Name: _____

Signature: _____

Contact (Phone / Email): _____ (officer of company)

Date: _____



LEED v4 for BD+C: Schools

Project Checklist

Project Name: **Massillon Westside - 250 29th St NW, Massillon Ohio**
 Date: 3/14/2023

Y ? N

Y	1	Credit	Integrative Process	1
2	1	12	Location and Transportation	15
	0	Credit	LEED for Neighborhood Development Location	15
1		Credit	Sensitive Land Protection	1
	2	Credit	High Priority Site	2
	1	4	Surrounding Density and Diverse Uses	5
	4	Credit	Access to Quality Transit	4
	1	Credit	Bicycle Facilities	1
	1	Credit	Reduced Parking Footprint	1
1		Credit	Green Vehicles	1
3	2	7	Sustainable Sites	12
Y		Prereq	Construction Activity Pollution Prevention	Required
Y		Prereq	Environmental Site Assessment	Required
1		Credit	Site Assessment	1
	2	Credit	Site Development - Protect or Restore Habitat	2
	1	Credit	Open Space	1
	1	2	Rainwater Management	3
	2	Credit	Heat Island Reduction	2
1		Credit	Light Pollution Reduction	1
	1	Credit	Site Master Plan	1
1		Credit	Joint Use of Facilities	1
5	3	4	Water Efficiency	12
Y		Prereq	Outdoor Water Use Reduction	Required
Y		Prereq	Indoor Water Use Reduction	Required
Y		Prereq	Building-Level Water Metering	Required
2		Credit	Outdoor Water Use Reduction	2
2	3	2	Indoor Water Use Reduction	7
	2	Credit	Cooling Tower Water Use	2
1		Credit	Water Metering	1
17	4	10	Energy and Atmosphere	31
Y		Prereq	Fundamental Commissioning and Verification	Required
Y		Prereq	Minimum Energy Performance	Required
Y		Prereq	Building-Level Energy Metering	Required
Y		Prereq	Fundamental Refrigerant Management	Required
5		1	Enhanced Commissioning	6
9	2	5	Optimize Energy Performance	16
	1	Credit	Advanced Energy Metering	1
2		Credit	Demand Response	2
	3	Credit	Renewable Energy Production	3
1		Credit	Enhanced Refrigerant Management	1
	2	Credit	Green Power and Carbon Offsets	2

8	0	5	Materials and Resources	13
Y		Prereq	Storage and Collection of Recyclables	Required
Y		Prereq	Construction and Demolition Waste Management Planning	Required
		5	Building Life-Cycle Impact Reduction	5
2		Credit	Building Product Disclosure and Optimization - EPD's	2
2		Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
2		Credit	Building Product Disclosure and Optimization - Material Ingredients	2
2		Credit	Construction and Demolition Waste Management	2
10	0	6	Indoor Environmental Quality	16
Y		Prereq	Minimum Indoor Air Quality Performance	Required
Y		Prereq	Environmental Tobacco Smoke Control	Required
Y		Prereq	Minimum Acoustic Performance	Required
2		Credit	Enhanced Indoor Air Quality Strategies	2
3		Credit	Low-Emitting Materials	3
1		Credit	Construction Indoor Air Quality Management Plan	1
2		Credit	Indoor Air Quality Assessment	2
1		Credit	Thermal Comfort	1
1	1	Credit	Interior Lighting	2
	3	Credit	Daylight	3
	1	Credit	Quality Views	1
	1	Credit	Enhanced Acoustic Performance	1
5	1	0	Innovation	6
4	1	Credit	Innovation	5
1		Credit	LEED Accredited Professional	1
1	2	1	Regional Priority (High Priority, Dense&Diverse, Rain Mgmt, Renewable E, LCA, Enhanced)	4
	1	Credit	Regional Priority: Rainwater Management??	1
1		Credit	Regional Priority: Enhanced IAQ	1
	1	Credit	Regional Priority: Surrounding Density & Diverse Uses - Infill/Adjacent	1
	1	Credit	Regional Priority:	1

51 | **14** | **45** **TOTALS** Possible Points: **110**

Certified: 40 to 49 points, Silver: 50 to 59 points, Gold: 60 to 79 points, Platinum: 80 to 110