

SECTION 019000

SUSTAINABILITY

PART 1 GENERAL

1.1 COLUMBIA UNIVERSITY GREEN BUILDING REQUIREMENTS

- A. Columbia University has achieved LEED Neighborhood Development (ND) Stage 1 Platinum certification for the Manhattanville campus, demonstrating Columbia's commitment to a sustainably designed campus.
- B. LEED, or Leadership in Energy and Environmental Design, is the most widely used third-party verification for green buildings, homes and communities that are designed, constructed, maintained and operated for optimal environmental and human health performance.
- C. All new construction and renovation projects on the Manhattanville campus must meet LEED ND requirements (Columbia University Green Building Design Standards – LEED Neighborhood Development masterplan appended below).
- D. All new construction and renovation projects on the Manhattanville campus must meet, at minimum, a LEED Silver certification. The following Sustainable Design Requirements provide the standard for all construction related activities.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions and Division 1 Specification Sections, apply to this Section. See Appendix for LEED ND Scorecard.

1.3 SUMMARY

- A. This Section includes administrative, procedural, and product requirements for compliance with the United States Green Building Council's (USGBC) LEED for Building Design + Construction (BD+C). Version to be the most current and applicable to the project.
- B. LEED requirements should be followed in conjunction with requirements in the Sections for individual construction activities. Any discrepancies between the two require notification of the Architect and the Architect's approval of the resolution.
- C. Other LEED prerequisites and credits needed to obtain LEED certification depend upon 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.
- D. The University has established that this Project shall achieve minimum LEED Silver certification.

1.4 GREEN BUILDING REQUIREMENTS

- A. The University requires the CM/GC to implement practices and procedures to meet the project's environmental performance goals, which include achieving LEED Silver Certification. Specific project goals that may affect this area of work include but are not limited to the following: use of recycled-content materials; use of locally manufactured materials; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor- air quality management plan. The Contractor shall ensure that the requirements related to these goals, as defined in the sections below, are fully implemented. Substitutions, or other changes to the work proposed by the CM/GC or their Subcontractors, shall not be allowed if such changes compromise the aforementioned environmental goals and LEED certification.

1.5 REFERENCED STANDARDS

- A. ANSI/ASHRAE/IESNA 90.1–Energy Standard for Buildings Except Low-Rise Residential Buildings.
- B. ANSI/ASHRAE 52.2-2017 – Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size.
- C. ANSI/ASTM-E779-03 – Standard Test Method for Determining Air Leakage Rate by Fan Pressurization.
- D. ANSI/SMACNA 008:2008 2nd Edition – IAQ Guidelines for Occupied Buildings under Construction.
- E. ASHRAE 55-2017 – Thermal Comfort Conditions for Human Occupancy.
- F. ASHRAE 62.1-2016 – Ventilation for Acceptable Indoor Air Quality.
- G. ASTM C1371-04a – Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
- H. ASTM C1549-04 – Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
- I. ASTM E408-71(2002) – Standard Test Methods for Total Normal Emittances of Surfaces Using Inspection-Meter Techniques.
- J. ASTM E903-96 – Standard Test Method for Solar Absorptance (SA), Reflectance, and Transmittance of Materials Using Integrating Spheres.
- K. ASTM E1371-04 – Standard Test Method for Gravimetric Determination of Phosphorus in Phosphorus-Copper Alloys or Phosphorus-Copper-Silver Alloys.
- L. ASTM E1903-97 – Phase II Environmental Site Assessment Process.
- M. ASTM E1918-16 – Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field.
- N. ASTM E1980-11– Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

- O. CA Title 24 – Residential Manual for Compliance with California’s 2001 Energy Efficiency Standards, Chapter 4.
- P. CIBSE – Applications Manual 10: 2005, Natural Ventilation in Non-Domestic Buildings.
- Q. CRI – Green Label Plus Testing Program.
- R. EPA – Brownfields Definition – Sustainable Redevelopment of Brownfields Program.
- S. EPA – Energy Policy Act (EPAct) of 1992, Fixture Flow Requirements.
- T. EPA 832-R-92-005 – Storm Water Management for Construction Activities, Chapter 3.
- U. EPA 840-B-92-002, Jan. 1993 – Guidance Specifying Management Measures for Sources of Non-Point Pollution in Coastal Waters
- V. EPA PB90200288 – Compendium of Methods for the Determination of Air Pollutants in Indoor Air.
- W. FEMA – 100-Year Flood Definition.
- X. FSC – Principles and Criteria for Certified Wood.
- Y. FWS – Endangered Species List.
- Z. Green-e – Center for Resource Solutions’ Electricity Product Certification Requirements.
- AA. Green Seal Standards – GS-03 Anti-corrosive Paints; GS-11 Architectural Paints, Coatings, and Primers; GS-36 Commercial Adhesives.
- BB. IPMVP – International Performance Measurement and Verification Protocol, Volume III: Concepts and Options for Determining Energy Savings in New Construction, April 2003.
- CC. ISO 14021:2016 – Environmental Labels and Declarations.
- DD. SCAQMD Rule #1113 – VOC Limits for Architectural Coatings.
- EE. SCAQMD Rule #1168 – VOC Limits for Adhesives, Sealant and Sealant Primers.
- FF. The Carbon Trust Good Practice Guide 237 – Natural Ventilation in Non-Domestic Buildings.
- GG. US Code of Federal Regulations – Definition of Prime Agricultural Land, Title 7, Volume 6, Parts 400-699, Section 657.5.
- HH. US Code of Federal Regulations – Definition of Wetlands, 40 CFR, Parts 230-233, and Part 22.

II. USGBC – LEED v4 BD+C Reference Guide

1.6 DEFINITIONS

- A. Brownfields: U.S. EPA Definition of Brownfields – With certain legal exclusions and additions, brownfield site means real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.
- B. Chain of Custody (COC): A tracking procedure to document the status of a product from the point of harvest or extraction to the ultimate end use. A “vendor” is defined as the company that supplies wood products to project contractors or subcontractors for on- site installation. Awarded to companies that produce, sell, promote, or trade forest products after audits verify proper accounting of material flows and proper use of the Forest Stewardship Council name and logo. The COC certificate number is listed on invoices for non-labeled products to document that an entity has followed FSC guidelines for product accounting.
- C. Chlorofluorocarbons (CFCs): Hydrocarbons that deplete the stratospheric ozone layer.
- D. Forest Stewardship Council (FSC): Forest Stewardship Council (FSC) is an independent, non-governmental, not for profit organization established to promote the responsible management of the world's forests. FSC provides certifications to award forest managers who adopt environmentally and socially responsible forest management practices and to companies that manufacture and sell products that directly support responsible forest management.
- E. Hydrochlorofluorocarbons (HCFCs): Refrigerants used in building equipment that deplete the stratospheric ozone layer, but to a lesser extent than CFCs.
- F. Pre-Consumer Content: Defined as material diverted from the waste stream during the manufacturing process. Examples in this category include planer shavings, ply trim, sawdust, chips, bagasse, sunflower seed hulls, walnut shells, culls, trimmed materials, print overruns, over-issue publications, and obsolete inventories. 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. (Previously referred to as Post-industrial Content.)
- G. Point of Harvest/Extraction/Recovery: Location where raw material is gathered for use in production.
- H. Point of Final Assembly: Location where individual components are assembled into a product that is furnished and installed by tradesmen.
- I. Pre-Consumer Content: Defined as material diverted from the waste stream during the manufacturing process. Examples in this category include planer shavings, plytrim, sawdust, chips, bagasse, sunflower seed hulls, walnut shells, culls, trimmed materials, print overruns, over-issue publications, and obsolete inventories. 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.

- J. **Post-Consumer Waste:** 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. This includes returns of materials from the distribution chain. Examples of this category include construction and demolition debris, materials collected through curbside and drop-off recycling programs, broken pallets, discarded products (e.g., furniture, cabinetry and decking) and urban maintenance waste (e.g., leaves, grass clippings, tree trimmings, etc.).
- K. **Solar Reflectance Index (SRI):** A measure of a material's ability to reject solar heat, as shown by a small temperature rise. It is defined so that a standard black (reflectance 0.05, emittance 0.90) is equal to zero (0), and a standard white (reflectance 0.80, emittance 0.90) is equal to one hundred (100).
- L. **Systems Furniture:** defined as either a panel-based workstation comprised of modular interconnecting panels, hang on components and drawer/file components or a free-standing grouping of furniture items and their components that have been designed to work in concert.
- M. **Vendor:** A Vendor of certified wood is the organization that sells/supplies wood products to contractors or subcontractors. A vendor must have an FSC Chain of Custody (COC) certificate if it is selling FSC-certified products for which its packaging or form will be modified and/or products that are not individually labeled; this includes most lumber.
- N. **Volatile Organic Compounds (VOCs):** Carbon compounds that participate in atmospheric photochemical reactions (excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and carbonates, and ammonium carbonate). The compounds vaporize (become a gas) at normal room temperatures.

1.7 SUBMITTALS

- A. For all products submitted in CSI MasterFormat 2018 Divisions 2 through 10 submit the following forms included with the product submittal:

- 1. Materials Reporting Form
- 2. VOC Reporting Form

Reporting forms are developed and governed by the LEED Consultant under the advisement of the Design Architect. All reporting forms and applicable tracking spreadsheets will be distributed to the Contractor upon receipt of this Division 1 spec section.

- B. The Contractor shall complete the Materials Reporting Form for all products in Divisions 2 through 10 according to the following schedule and requirements:
 - 1. At the beginning of construction, submit the Materials Tracking Form with the specification sections updated according to the submittal log and with estimated construction cost and materials cost columns completed.
 - 2. On a monthly basis during construction update and submit the Materials Tracking Form with actual Product Data and Cost Data.

3. At the completion of construction, submit a final Materials Tracking Form with all product data and cost data.
- C. For all products containing recycled content except mechanical, electrical, and plumbing components, submit a cut sheet or a written affidavit on company letterhead (email is not acceptable) included with the product submittal from the manufacturer indicating:
1. The percentage by material weight of post-consumer recycled content.
 2. The percentage by material weight of pre-consumer recycled content.
- D. For all products with a Point of Harvest/Extraction/Recovery within five hundred (500) miles of the Project site except mechanical, electrical, and plumbing components, submit a cut sheet or a written affidavit from the manufacturer indicating:
1. The product Point of Final Assembly.
 2. Any product component materials harvested, extracted, or recovered within five hundred (500) miles of the project site and the material percentage by weight.
 3. The distance, in miles, from the Point of Final Assembly to the Project location measured as the most direct route between the two points.
- E. For permanently installed non-recycled wood and wood-based materials, submit the following:
1. Forest Stewardship Council's Chain of Custody (COC) Certification Number for each installed certified product, declaring conformance with FSC Guidelines for certified wood COC numbers shall be obtained from the manufacturer and must be itemized on a line-item basis.
 2. Vendor invoices including FSC certified and non FSC-certified, products purchased. Invoices must include:
 - a. Itemization of each wood product identified as such on a line item basis.
 - b. FSC products identified as such on a line-item basis and must be identified as "Credit," or "FSC Mixed [NN] %"
 - c. The dollar value of each line item.
 - d. The vendor's chain-of custody (COC) number must be shown on any invoice that includes FSC products.
 - e. If it is impractical for a vendor to invoice wood products on a line-item basis because the invoice would be excessive in length, the invoice should indicate the aggregate value of wood products sold by the vendor.
- F. For all composite wood and agrifiber products, including core materials, submit a cut sheet or written affidavit from the manufacturer stating that they contain no added urea-formaldehyde resins or adhesives.
- G. For all laminating adhesives, submit a cut sheet or written affidavit from the manufacturer stating that they contain no added urea-formaldehyde.

- H. For all carpet systems and carpet pad products, submit approved “Green Label Plus” Product Identification Numbers for each installed product or system.
- I. For the products listed below submit the following included with the product submittal:
 - 1. Adhesives
 - a. Material Safety Data Sheet (MSDS) or product data sheets highlighting VOC content.
 - 2. Sealants
 - a. Material Safety Data Sheet (MSDS) or product data sheets highlighting VOC content.
 - 3. Paints
 - a. MSDS or product data sheets highlighting VOC content.
 - b. Cut Sheet-highlighting compliance with Green Seal requirements.
 - 4. Architectural Coatings
 - a. MSDS or product data sheets highlighting VOC content.
 - 5. Carpets
 - a. MSDS or product data sheets highlighting VOC content.
 - b. Cut Sheet highlighting compliance with CRI Green Label Plus Testing Program standard.
 - 6. Roof System Components
 - a. Cut Sheet indicating that materials are Energy Star compliant and meet or exceed a Solar Reflectance Index (SRI) of 78 for low-sloped roof or 29 for steep-sloped roof.
 - 7. Stormwater filtration devices
 - a. Cut Sheets or written affidavit from the manufacturer indicating the percentage of Total Suspended Solids filtered and the percentage of Total Phosphorus filtered by the devices.
 - 8. Filtration media
 - a. Cut Sheets with MERV values highlighted.
 - 9. Plumbing fixtures
 - a. Cut Sheets with flow rates highlighted.

- J. Indoor Air Quality: The Contractor shall provide prior to the beginning of construction a copy of the Project Specific Contractor Construction Indoor Air Quality Management Plan, and upon substantial completion of the project a copy of the Project Specific Contractor Construction Indoor Air Quality Summary Report

1. Construction Project Specific Contractor IAQ Management Plan shall include:

- a. Designation of the parties who will implement and document the Plan.
- b. A description of how construction will meet or exceed the minimum requirements of SMACNA IAQ Guidelines for Occupied Buildings under Construction. The plan shall contain at least the following measures:

1.) HVAC Protection

- i. Avoid the use of the HVAC system during construction.
- ii. If the HVAC system must be used during construction, shut down return side of HVAC system whenever possible during heavy construction or demolition.
- iii. The HVAC system should be fitted with temporary filters during construction (filters must have a rating of MERV 8 or better) that should be replaced with clean media (MERV 13 or better) just prior to substantial completion and occupancy.

2.) Source Control

- i. Specify finish materials with low or no toxicity.

3.) Pathway Interruption

- i. Isolate areas of work to prevent contamination of clean or occupied spaces using pressure differentials and/or temporary barriers when necessary.
- ii. Depending on climate, ventilate using one hundred percent (100%) outside air to exhaust contaminated air directly to the outside during installation of VOC- emitting materials.

4.) Housekeeping

- i. Protect stored on-site or installed absorptive and porous materials from moisture damage:
 - Store materials on elevated platforms under cover and in a dry location.
 - If materials are not stored in an enclosed location, cover tops and sides of material with waterproof sheeting, securely tied.
 - Phase construction such that absorptive materials are installed only in areas that are weather-tight.
- ii. Use vacuum cleaners with high efficiency particulate filters.

5.) Scheduling

- i. Sequence construction activities in a way that minimizes impact on indoor air quality.
 - ii. Institute cleaning activities concentrating on HVAC and building spaces to remove contaminants from the building prior to occupancy. This includes cleaning all coils, air filters, and fans.
 - c. A description of corrective measures that will be taken if any absorptive materials are exposed to moisture during construction.
 - d. Replacement of all filtration media (MERV 13 or better – including but not limited to HEPA filtration) immediately prior to occupancy.
 - e. Measures taken to ensure high IAQ levels after occupation of interior construction and finish work.
 - 2. The Construction Project Specific Contractor IAQ Summary Report shall include:
 - a. Summary of measures taken during construction to comply with the SMACNA IAQ Guidelines for Occupied Buildings under Construction. Include a brief description of compliance measures implemented.
 - b. Photographs of measures taken during construction in order to show consistent adherence to the Construction Project Specific Contractor IAQ Plan. No less than six photographs are to be taken on each of three different occasions. Each photograph submitted should identify a particular SMACNA compliance measure.
 - c. Provide documentations of proper filter use and replacement according to the Indoor Air Quality Management Plan.
 - d. Documentation of building flush out with dates and cut sheets of filtration media OR Results of Construction Project Specific Contractor IAQ tests including a description of testing procedures.
- K. Construction Waste Management: The Contractor shall provide prior to the beginning of construction a copy of the Construction Waste Management Plan, and upon substantial completion of the project a copy of the Construction Waste Management Summary Report, highlighting the end-of-project recycling and salvage rates and landfill rates.
- 1. Construction Waste Management Plan shall include:
 - a. Designation of the parties who will implement and document the Plan.
 - b. Description of measures that will be taken to achieve recycling and salvage requirements with a requirement of recycling seventy-five percent (75%) of materials and a goal of ninety-five percent (95%).
 - c. Identification of materials to be diverted from disposal.
 - d. Description of whether waste materials will be stored on-site or co-mingled.
 - 2. The Construction Waste Management Summary Report shall include:
 - a. Summary of measures taken to recycle construction materials.
 - b. Listing of end-of-project recycling, salvage rates, and landfill rates, by material weight.
 - c. Copies of waste hauling receipts/tickets documenting whether the waste was

- recycled or landfilled.
 - d. A table of the demolition debris, including a general description of each category of waste generated, the quantity in tons or cubic yards, and the location of receiving agent (recycler, landfill, etc.) for waste.
 - e. A calculation showing total percentage of materials diverted from landfill disposal.
3. The Contractor shall complete a Construction Waste Management Tracking Form according to the following schedule and requirements:
- a. On a monthly basis during construction update and submit the Construction Waste Tracking Form.
 - b. At the completion of construction, submit a final Construction Waste Tracking Form with all product data and cost data.
- L. Construction Materials Summary Report: After substantial completion of the project, the Contractor shall prepare and submit a Construction Material Summary Report.
- 1. The Construction Materials Summary Report shall be organized by LEED credit, compiled and bound at the end of construction. This bound document (either paper or electronic) shall be submitted to Atelier Ten and the Columbia University.
 - 2. The Construction Materials Summary Report shall contain:
 - a. Total project material cost, which excludes related labor and equipment costs, and which excludes all mechanical, electrical, and plumbing components and related costs.
 - b. A summary by construction division of material costs, less related labor and equipment costs.
 - c. A summary by construction division of all products containing recycled content, including the product material costs and the product percentages of post-consumer recycled content and post-industrial recycled content.
 - d. A summary by construction division of the value of materials and products that have a Point of Final Assembly within five hundred (500) miles of the Project site.
 - e. A summary by construction division of the value of materials that are extracted, harvested, or recovered (as well as manufactured) within five hundred (500) miles of the Project site.
 - f. For any materials with recycled content, cut sheets or written affidavits from manufacturers listing the material percentage by weight of post-consumer recycled content and post-industrial recycled content.
 - g. For any materials with a Point of Final Assembly or an extraction, harvest, or recovery site within five hundred (500) miles of the Project, cut sheets with manufacturing and extract location or written affidavit from the manufacturer listing the distance from the manufacture or extract location to the Project site.
- M. LEED Application Documentation: At or before substantial completion, the Contractor shall prepare LEED Letter Templates and supporting documentation for each LEED construction credit to be attempted.
- 1. LEED Letter Template shall be downloaded from the LEED Online website and distributed to the Contractor by the Sustainability/LEED Consultant.

2. Sustainability/LEED Consultant shall prepare and distribute Documentation Matrix to the Contractor. The Documentation Matrix illustrates that the deliverables required to adequately record the project have met the intent of each credit.
3. The Contractor shall send completed LEED Letter Templates and associated documentation to the Sustainability /LEED Consultant for review and comment. LEED Letter Template shall contain:
 - a. All proper data fields completed declaring that the project has met the intent of the credit, including a narrative when applicable.
 - b. Electronic signature of Contractor and date signed.
4. Once approved, the Contractor shall upload LEED Letter Templates and documentation to the LEED Online website.

1.8 QUALITY ASSURANCE

- A. Site Stormwater Filtration: Remove a minimum of eighty percent (80%) of suspended solids and forty percent (40%) of total phosphorus from site stormwater runoff.
- B. Minimum Energy Performance: Exceed the minimum energy efficiency and performance standards as established by ASHRAE 90.1-2004 by twenty percent (20%.) This is a Columbia University Green Building Standard.
- C. Fundamental Building Systems Commissioning: Verify and ensure that fundamental building system elements are designed, installed, and calibrated to operate as intended. Comply with the LEED BD+C Energy and Atmosphere Prerequisite 1: Fundamental Commissioning of the Building Energy Systems.
- D. Montreal Protocol Compliance: Ensure that no CFCs or HCFCs are used in building HVAC&R equipment.
- E. Measurement & Verification: Provide building systems metering sufficient to allow for the ongoing accountability and optimization of water consumption, electrical consumption and building and/or energy system performance over time. Comply with the long-term continuous measurements of performance consistent with Option B or Option D of the International Performance Measurement and Verification Protocol (IPMVP) Volume III for building HVAC&R equipment and lighting systems and controls.
- F. Minimum Indoor Air Quality Performance: Provide HVAC equipment that will comply with the minimum requirements of ASHRAE 62.1-2010.
- G. Exterior Lighting: Meet or provide lower light level and uniformity ratios than those recommended by the Illuminating Engineering Society of North America (IESNA) Recommended Practice Manual: Lighting for Exterior Environments (RP-33-99). Insure that all exterior luminaires with more than one thousand (1000) initial lamp lumens are shielded, and all luminaires with more than three thousand five hundred (3500) initial lamp lumens meet the Full Cutoff IESNA Classification.
- H. Thermal comfort: Provide a thermally comfortable indoor environment.

1. Provide HVAC equipment to comply with ASHRAE Standard 55-2010 for thermal comfort standards including humidity control within established ranges.
 2. Install a permanent temperature and humidity monitoring system configured to provide operators control over thermal comfort performance and effectiveness of humidification and/or dehumidification systems in the building.
- I. Storage and Collection of Recyclables: Provide an easily accessible dedicated area or areas greater than 175 square feet for the collection and storage of materials for recycling. Materials must include at a minimum paper, corrugated cardboard, glass, plastics, and metals.
 - J. Low-Emitting Materials: Reduce the quantity of indoor air contaminants by ensuring adhesives, sealants, paints, and coatings used or installed on the interior of the building comply with the required limits of Volatile Organic Compounds as described in this Section.

PART 2 PRODUCTS

2.1 UNAUTHORIZED PRODUCTS

- A. Materials and products required for work of this section shall not contain asbestos, polychlorinated biphenyls (PCBs) or other hazardous materials identified by the University.

2.2 MATERIALS – GENERAL

- A. Provide products and procedures necessary to obtain LEED credits required in this Section. Although other Sections may specify some requirements that contribute to LEED credits, the Contractor shall determine additional materials and procedures necessary to obtain LEED credits indicated.
- B. VOC-Containing Products: All adhesives, sealants, paint, and architectural coatings used in the building interior (inside of the exterior moisture barrier) must meet the VOC content limits specified in this Section and other related Sections.

2.3 ADHESIVES

- A. All adhesives used in the building interior (i.e. inside of the exterior moisture barrier) must not exceed either the VOC content limits established by South Coast Air Quality Management District (SCAQMD) Rule #1168, including, but not limited to, the following:
 1. Architectural Adhesives Applications:
 - a. Indoor Carpet Adhesives: 50 g/L.
 - b. Carpet pad adhesives: 50 g/L.
 - c. Outdoor Carpet Adhesives: 150 g/L.
 - d. Wood Flooring Adhesives: 100 g/L.
 - e. Rubber Floor Adhesives: 60 g/L.
 - f. Subfloor Adhesives: 50 g/L.
 - g. Ceramic tile installation: 65 g/L.

- h. Dry Wall and Panel Adhesives: 50 g/L.
- i. VCT and asphalt tile installation: 50 g/L.
- j. Cove base installation: 50 g/L.
- k. Multipurpose Construction Adhesives: 70 g/L.
- l. Structural Glazing Adhesives: 100 g/L.

2. Substrates:

- a. Metal to metal: 30 g/L.
- b. Plastic foams: 50 g/L.
- c. Porous material except wood: 50 g/L.
- d. Wood: 30 g/L.
- e. Fiberglass: 80 g/L.

3. Welding & Installation

- a. PVC welding: 510 g/L.
- b. CPVC welding: 490 g/L.
- c. ABS welding: 400 g/L.
- d. Plastic cement welding: 350 g/L.
- e. Adhesive primer for plastic: 650 g/L.
- f. Contact Adhesive: 80 g/L.
- g. Special Purpose Contact Adhesives: 250 g/L.
- h. Structural Wood Member Adhesive: 140 g/L.
- i. Sheet Applied Rubber Lining Operations: 850 g/L.
- j. Top and Trim Adhesive: 250 g/L.

B. All aerosol adhesives used in the building interior (i.e. inside of the exterior moisture barrier) must not exceed the VOC content limits established by Green Seal Standard GC-36, Edition 2.1, July 12, 2013 including, but not limited to, the following:

- 1. General-purpose mist spray: 65% VOCs by weight.
- 2. General-purpose web spray: 55% VOCs by weight.
- 3. Special purpose aerosol adhesives (all types): 70% VOCs by weight.

2.4 SEALANTS

C. All sealants used in the building interior (i.e. inside of the exterior moisture barrier) must not exceed the VOC content limits established by SCAQMD Rule #1168, including, but not limited to, the following:

- 1. Architectural: 250 g/L.
- 2. Porous Architectural Sealant Primer: 775 g/L.
- 3. Non-porous Architectural Sealant Primer: 250 g/L.

2.5 PAINTS

- D. All paints must not exceed the VOC and chemical component limits of Green Seal Standard, GS-11, Paints, Edition 3.1, October 26, 2015, for Topcoat Paints, including, but not limited to, the following:
 - 1. Non-flat paint: 100 g/L.
 - 2. Non-flat high gloss paint: 150 g/L.
 - 3. Flat: 50 g/L.
- E. All anti-corrosive and anti-rust paints must not exceed the VOC and chemical component limits of Green Seal Standard, GS-03, Anti-Corrosive and Anti-Rust Paints, Second Edition, January 7, 1997 for applications on ferrous metal substrates, including, but not limited to, the following:
 - 1. Gloss: 250 g/L.
 - 2. Semi-gloss: 250 g/L.
 - 3. Flat: 250 g/L.

2.6 ARCHITECTURAL COATINGS

- F. All site-applied architectural coatings must meet or exceed the VOC and chemical component limits of SCAQMD Rule #1113 Amended February 5, 2016, VOC Limits for Architectural Coatings, including, but not limited to, the following:
 - 1. Bond Breakers: 350 g/L.
 - 2. Clear Wood Finishes
 - a. Varnish: 275 g/L.
 - b. Sanding Sealers: 275 g/L.
 - c. Lacquer: 275 g/L.
 - 3. Clear Brush Lacquer: 680 g/L.
 - 4. Concrete-curing compounds: 100 g/L.
 - 5. Dry-fog coatings: 50 g/L.
 - 6. Fireproofing exterior coatings: 350 g/L.
 - 7. Fire-retardant coatings:
 - a. Clear: 650 g/L.
 - b. Pigmented: 350 g/L.
 - 8. Floor coatings: 50 g/L.
 - 9. Graphic arts (signs) coatings: 200 g/L.

10. Industrial Maintenance (IM) coat: 100/gL.
 - a. High temperature IM coatings: 420 g/L.
 - b. Zinc-rich IM primers: 100g/L.
11. Japan/faux finishing coatings: 350 g/L.
12. Magnesite cement coatings: 450 g/L.
13. Mastic coatings: 100 g/L.
14. Metallic pigmented coatings: 150 g/L.
15. Multi-color coatings: 250 g/L.
16. Pigmented lacquer: 550 g/L.
17. Pre-treatment wash primers: 420 g/L.
18. Primers, sealers and undercoats: 100 g/L.
19. Quick dry enamels: 250 g/L.
20. Quick-dry primers, sealers and undercoats: 200 g/L.
21. Recycled coatings: 250 g/L.
22. Rust preventative coatings: 100 g/L.
23. Shellac-Clear: 730 g/L.
24. Shellac-Pigmented: 550 g/L.
25. Specialty primers: 100 g/L.
26. Stains: 250 g/L.
27. Waterproofing sealers: 100 g/L.
28. Waterproofing concrete/masonry sealers: 100 g/L.
29. Wood preservatives: 350 g/L.

2.7 FLOORING SYSTEMS

- G. Carpet systems must meet or exceed the testing and product requirements of the Carpet and Rug Institute's (CRI) Green Label Plus program.
- H. Carpet cushions must meet or exceed the requirements of the CRI Green Label Plus program.

- I. Carpet adhesives must meet the VOC requirements established by SCAQMD Rule #1168.
- J. Hard surface flooring must be certified as compliant with the Floor Score standard by an independent third party. This requirement does not apply to 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. Concrete, wood, bamboo and cork floor finishes such as sealer, stain and finish must meet the VOC requirements established by SCAQMD Rule #1168 and #1113.

2.8 WOOD AND WOOD PRODUCTS

- A. All non-recycled wood and wood-based materials should be certified in accordance with Forest Stewardship Council Guidelines. This includes all wood permanently installed in the project but is not limited to structural framing and dimensional lumber, blocking, flooring, finished woodwork, millwork, casework, and non-rented temporary construction applications such as bracing, concrete form work, and pedestrian barriers. No partial claims shall be made for products that contain FSC certified wood but are not sold with an FSC claim.
- B. Chain of Custody (COC) requirements are required to different extents based on two scenarios:
 - 1. If a manufacturer places its FSC COC label on product packaging used for individual sale (generally applying to fabricated products), then subsequent entities in the supply chain are not required to have COC certification unless the product's packaging or form is changed before it reaches the end consumer.
 - 2. For products that are not individually packaged for sale to be sold as FSC certified, the vendor to the consumer is required to have COC certification. CM/GCs and subcontractors are considered the end consumers; they can demonstrate with copies of invoices (if requested) the quantity purchased for the job and their suppliers' COC numbers.

2.9 COMPOSITE WOOD PRODUCTS

- A. Composite wood products must contain no added urea-formaldehyde resins.
- B. Laminating adhesives used to assemble composite wood and agrifiber products shall not contain added urea-formaldehyde resins.

2.10 AGRIFIBER PRODUCTS

- A. Agrifiber board products must contain no added urea-formaldehyde resins.

2.11 PLUMBING FIXTURES

- A. Plumbing fixtures must meet or exceed the following flow requirements, as described by EPA Energy Policy Act (EPA) of 1992 flow requirements.

1. Toilets: 1.6 gallons per flush (gpf)
2. Urinals: 1 gpf
3. Lavatory faucets (private applications): 2.2 gallons per minute (gpm) at 60 pounds per square inch (psi)
4. Lavatory faucets (public applications): 0.5gpm at 60psi
5. Lavatory metering faucets: 0.25 gallons per cycle
6. Pre-rinse spray valves: ≤ 1.6 gpm

END OF SECTION