

SECTION 01 81 13
SUSTAINABILITY REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY

- A. Work Included: BART Sustainability Requirements.
- B. Related Sections:
 - 1. Section 01 31 19, Project Meetings.
 - 2. Section 01 32 16, Construction Progress Schedule.
 - 3. Section 01 33 00, Submittal Procedures.
 - 4. Section 01 33 23, Shop Drawings, Product Data, and Samples.
 - 5. Section 01 57 00, Temporary Controls.
 - 6. Section 01 60 00, Product Requirements.
 - 7. Section 01 74 21, Waste Management.
 - 8. Division 1 sections as referenced in this section.
 - 9. Technical Specifications containing sustainability requirements as applicable for this Contract.
- C. This section represents Sustainability Requirements for BART projects.

1.02 REFERECNCES

- A. General: Comply with the applicable provisions of the current version of the referenced standards except as modified by governing codes and the Contract Documents. In the event of conflict between referenced standards, this specification or within themselves, the more stringent standard or requirement shall govern.
 - 1. American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)
 - 2. Bay Area Air Quality Management District (BAAQMD)
 - 3. California Green Building Standards Code California Code of Regulations, Title 24, Part 11 (CALGreen) Environmental Protection Agency (EPA)
 - 4. Carpet and Rug Institute (CRI) (Green Label, Green Label Plus)
 - 5. California Air Resources Board (ARB)

6. Forest Stewardship Council (FSC)
7. Green Seal
8. Illuminating Engineering Society of North America (IESNA)
9. Sheet Metal and Air Conditional National Contractor Association (SMACNA)
10. South Coast Air Quality Management District (SCAQMD)
11. United States Green Building Council (USGBC): Leadership in Energy and Environmental Design (LEEDTM) Green Building Rating System, 2009 Version.

1.03 DEFINITIONS

- A. Agrifiber Products: Composite panel products derived from agricultural fiber
- B. Biobased Product: As defined in the 2002 Farm Bill, a product determined by the Secretary to be a commercial or industrial product (other than food or feed) that is composed, in whole or in significant part, of biological products or renewable domestic agricultural materials (including plant, animal, and marine materials) or forestry materials.
- C. Biobased Content: The weight of the biobased material divided by the total weight of the product and expressed as a percentage by weight.
- D. Certificates of Chain-of-Custody: Certificates signed by manufacturers certifying that wood used to make products has been tracked through its extraction and fabrication to ensure that it was obtained from forests certified by a specified certification program.
- E. Composite Wood: A product consisting of wood fiber or other plant particles bonded together by a resin or binder.
- F. Construction and Demolition Waste: Includes solid wastes, such as building materials, packaging, rubbish, debris, and rubble resulting from construction, remodeling, repair, and demolition operations.
- G. Light Pollution: Light that extends beyond its source such that the additional light is wasted in an unwanted area or in an area where it inhibits view of the night sky.
- H. Recycled Content Materials: Products that contain pre-consumer or post-consumer materials as all or part of their feedstock.
- I. Post-Consumer Recycled Content: The percentage by weight of constituent materials that have been recovered or otherwise diverted from the solid-waste stream after consumer use.
- J. Pre-Consumer Recycled Content: Materials that have been recovered or otherwise diverted from the solid-waste stream during the manufacturing process. Pre-consumer content must be material that would not have otherwise entered the waste

stream as per Section 5 of the FTC Act, Part 260 “Guidelines for the Use of Environmental Marketing Claims”: www.ftc.gov/bcp/grnrule/guides980427

- K. Regional Materials: Materials that are extracted, harvested, recovered, and manufactured within a radius of 250 miles (400 km) from the Project site.
- L. Rapidly Renewable Materials: Materials from plants harvested within a 10-year or shorter cycle.
- M. Salvaged or Reused Materials: Materials extracted from existing buildings in order to be reused in other buildings without being manufactured.
- N. Sealant: Any material that fills and seals gaps between other materials.
- O. Volatile Organic Compounds (VOCs): Any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions. Compounds that have negligible photochemical reactivity, listed in EPA 40 CFR 51.100(s), are also excluded from this regulatory definition.

1.04 SUBSTITUTIONS

- A. The following substitution requirements apply to materials and assemblies that list Sustainability Requirements. For general substitution requirements, refer to Section 01 33 00, Submittal Procedures, Section 01 33 00, Shop Drawings, Product Data, and Samples, and Section 01 60 00, Product Requirements.
- B. To substitute products that affect Sustainability Requirements, propose products that offer equivalent or increased environmental sensitivity and meet the intent of the Contract Documents. Substitutions that may affect Sustainability Requirements shall be clearly identified.
- C. Inform Engineer in writing where Sustainability Requirements could detrimentally impact project cost, schedule or quality or where project conditions require alternate materials or procedures. This notice shall be given prior to the completion of the submittal schedule specified in Section 01 33 00.
- D. Guidelines: Only one substitution for a product with Sustainability Requirements will be considered. If the substitution is rejected, provide the specified product. Submit the following for review by Engineer:
 - 1. Product data, including manufacturer, website, and phone number.
 - 2. Copy of VOC testing data (if applicable).
 - 3. Description of the differences between the proposed substitution and the specified product related to Sustainability Requirements. Explain the environmental advantages of the proposed product as compared to the specified product.

4. The Contractor is responsible for re-submittals of calculations, documentation of products, or material substitutions that affect Sustainability Requirements.
 5. Identify product substitution by Specification and affected Sustainability Requirements.
 6. Give cost data comparing proposed substitution with specified product and amount of net change to Contract Sum.
 7. State effect of substitution on construction schedule and changes required in other work of products.
- E. Within 14 Days of substantial completion, provide all approved Substitution Request Forms related to this section.

1.05 SUBMITTALS

- A. General: This section provides an overview of Sustainability Information submittals. Refer to technical specification sections for Sustainability Information to be submitted for specific products.
- B. Schedule of submittals: Schedule shall be provided per Section 01 33 00. Not more than 30 Days after the effective date of Notice to Proceed, the General Contractor shall provide to the Engineer an updated schedule of submittals that includes cost and sustainability information. The Project Materials Cost Schedule shall be an electronic spreadsheet tabulating the total cost for the Project and the total cost of building materials used for the Project, as follows:
1. Schedule of materials costs for all materials to be submitted for the Project organized by specification section. Exclude labor costs and all mechanical, electrical, and plumbing (MEP) systems materials and labor costs. Include the following:
 - a. Statement indicating total cost for materials used for Project in Divisions 03-10 and 31-32 excluding labor, overhead, and profit.
 - b. Where materials cost breakdown is not available, use default value of 45 percent of total cost.
 - c. Only include materials permanently installed in the project. Furniture should also be included where applicable.
 - d. The spreadsheet shall include line items for each material including, the product name, the manufacturer of the material, and the product cost. The spreadsheet shall include line items for sustainability characteristics as applicable for each product as noted below:
 - 1) Salvaged or Reused Materials: Identify the reused or salvaged content being tracked for recycled content. As applicable, include the source or vendor and the product's replacement value. The spreadsheet shall provide a tabulation of the total combined salvaged/reused content value for all materials as a percentage of total materials costs.

- 2) Recycled Content: Identify the pre-consumer and post-consumer recycled content (as a percentage of the product's weight), the combined recycled content value (defined as the sum of the post-consumer recycled content value plus one-half of the pre-consumer recycled content value), and the source of the recycled content data. The spreadsheet shall provide a tabulation of the total combined recycled content value for all materials as a percentage of total materials costs.
 - 3) Regional Materials: Identify each regional material, its manufacturing location, the distance of this location from the Project site, the source location for each raw material component of the material, and the distance of these extraction locations from the Project site. For materials with multiple materials sources, tabulate the percentage of the product by weight that meets both the extraction and manufacturer location criteria. The spreadsheet shall provide a tabulation of the total value of regional materials as a percentage of total materials costs.
 - 4) Rapidly Renewable Products: Identify each rapidly renewable material, its source, and the percentage of the product (by weight) that meets the rapidly renewable criteria. The spreadsheet shall provide a tabulation of the total value of rapidly renewable materials as a percentage of total materials costs.
 - 5) Certified Wood: Identify each wood-based material, identify which of these products (or components of products) are FSC certified, and provide the entity's Chain of Custody (COC) certification number. The spreadsheet shall provide a tabulation of the total value of FSC Certified wood as a percentage of total wood-based materials costs.
2. Project Materials Cost Schedule Progress Reports: The spreadsheet shall be updated and submitted every third month (or as otherwise directed by the Engineer) with the Contractor's Certificate and Application for Payment.
 3. Provide final versions of the Project Materials Cost Schedule to the Engineer not more than 14 Days after Substantial Completion.
- C. Within seven Days of Notice to Proceed, submit Contractor timeline for providing the following plans. The submittal dates for these plans, and any critical-path items related to these plans, shall be integrated into the Contract Schedule specified in Section 01 32 16, Construction Progress Schedule.
1. Stormwater Pollution Prevention Plan complying with Section 01 57 00, Temporary Controls.
 2. Waste Management Plan complying with Section 01 74 21, Waste Management.
- D. Sustainability Progress Reports: Concurrent with each Payment Application Form, specified in Section 01 20 00, Price and Payment Procedures, submit reports for the following:
1. Project Materials Cost Schedule Progress Reports: Updated spreadsheets as noted in Project Materials Cost Schedule section above. Frequency of these reports shall be as directed by Engineer.

2. Stormwater Pollution Prevention Plan inspection documentation as specified in Section 01 57 00, Temporary Controls.
 3. Construction Waste Management: Waste reduction progress reports and logs complying with the requirements of Section 01 74 21, Waste Management.
- E. Final Sustainability Reports: Provide the following within 14 Days of Substantial Completion:
1. Final Project Materials Cost Schedule
 2. Final Summary of Solid Waste Disposal and Diversion complying with the requirements of Section 01 74 21, Waste Management.
 3. SWPPP final approved annual report as specified in Section 01 57 00, Temporary Controls.
- F. Product Sustainability Information: Furnish the following Sustainability Information submittals as noted in the applicable Technical Specifications sections. Sustainability Information shall be included in product submittals and shall not be submitted separately from other product information. No submittal is complete without formal verification by the Contractor that sustainability requirements for that product have been met:
1. Heat Island Effect:
 - a. Site Paving: Submit manufacturer's cut sheets for all impervious paving materials, highlighting the Solar Reflectance Index (SRI) of the material. Submit cut sheets for all pervious paving materials.
 - b. Roofing Materials: Submit manufacturer's cut sheets or product data highlighting the Solar Reflectance Index (SRI) of the material.
 2. Exterior Lighting Fixtures: Submit cut sheets with manufacturer's data on exterior light pollution minimization, as specified in Section 26 50 00, Lighting.
 3. Irrigation Systems: Submit manufacturer's cut sheets for permanent irrigation system components and for rainwater harvesting system components.
 4. Water Conserving Fixtures: Submit manufacturer's cut sheets for water-consuming plumbing fixtures and fittings (toilets, urinals, faucets, showerheads, etc.) per Section 22 40 00, Plumbing Fixtures.
 5. Process Water Use: Submit manufacturer's cut sheets for water-consuming commercial equipment highlighting water consumption performance, water use reduction measures, and corrosion inhibitors.
 6. Elimination of Ozone-Depleting Substances: Submit manufacturer's cut sheets for cooling equipment, fire-suppression equipment, and insulation highlighting refrigerant or blowing agents per Section 23 81 00, Unitary HVAC Equipment; Section 21 22 00, Clean Agent Fire Extinguishing System; and Section 07 21 11, Building Insulation.

7. Appliances and Equipment: Submit manufacturer's product data for equipment and appliances, including office equipment, computers and printers, and electronics (excluding HVAC and lighting components) highlighting Energy Star certification.
8. On-Site Renewable Energy Systems: Submit cut sheets and manufacturer's product data for on-site renewable energy generating components and equipment, including documentation of output capacity.
9. Salvaged or Reused Materials: Submit documentation of each salvaged or reused material, the source or vendor of the material, the purchase price, and the replacement cost if greater than the purchase price.
10. Recycled Content: Submit documentation for all materials with recycled content (excluding MEP systems equipment and components) and include the following:
 - a. Cost of each material or product, excluding cost of labor and equipment for installation per "Project Materials Cost Schedule" in the Submittals section above.
 - b. Manufacturer's product data, product literature, or a letter from the manufacturer verifying the percentage of post-consumer and pre-consumer recycled content (by weight) of each material or product.
11. Regional Materials: Submit documentation of products or materials expected to contribute to the regional calculation (excluding MEP systems equipment and components) and include the following:
 - a. Cost of each material or product, excluding cost of labor and equipment for installation per "Project Materials Cost Schedule" in the Submittals section above.
 - b. Location of product manufacture and distance from point of manufacture to the Project Site.
 - c. Location of point of extraction, harvest, or recovery for each raw material in each product and distance from the point of extraction, harvest, or recovery to the Project Site.
12. Rapidly Renewable Products: Submit documentation of products or materials expected to contribute to the rapidly renewable product calculation and include the following:
 - a. Cost of each material or product, excluding cost of labor and equipment for installation per "Project Materials Cost Schedule" in the Submittals section above.
 - b. Manufacturer's product data, product literature, or a letter from the manufacturer verifying that rapidly renewable materials and indicate the percentage (by weight) of the rapidly renewable components contained in the candidate products, along with the costs of each of these materials, excluding labor and delivery costs.

13. Certified Wood: Submit documentation of wood-based materials and include the following:
 - a. Cost of each material or product, excluding cost of labor and equipment for installation per “Project Materials Cost Schedule” in the Submittals section above.
 - b. Product data and certificates of chain-of-custody of certified-wood products by an FSC-accredited certification body for FSC 1.2 “Principles and Criteria.” Visit www.fscus.org/green_building for more information.
14. Adhesives and Sealants: Submit documentation of field-applied adhesives, sealants, and sealant primer product, and include:
 - a. Manufacturer’s name, product name, specific VOC data (in g/L less water) for each product, and the corresponding allowable VOC from the referenced standard.
 - b. Manufacturer cut sheets, literature, letter, or MSDS for each adhesive/sealant, with the VOC content (g/L less water) circled. VOC content shall be calculated according to 40 CFR 59, Subpart D (EPA method 24).
 - c. Manufacturers’ documentation verifying all adhesives used to apply laminates, whether shop-applied or field-applied, contain no urea-formaldehyde.
15. Paints and Coatings: Submit documentation for field-applied paints and coatings and include:
 - a. Manufacturer’s name, product name, specific VOC data (in g/L less water) for each product, and the corresponding allowable VOC from the referenced standard.
 - b. Manufacturer cut sheets, literature, letter, or MSDS for each paint or coating, with the VOC content (g/L less water) circled, calculated according to 40 CFR 59, Subpart D (EPA method 24).
16. Floorcoverings: Submit documentation for floorcovering systems, including carpet, resilient flooring, and engineered wood and bamboo flooring and include indoor emissions testing information as specified in the applicable technical specifications sections.
17. Composite Wood and Agrifiber Binders and Glues: Submit documentation for all composite wood and agrifiber products (including but not limited to particleboard, wheatboard, strawboard, agriboard products, engineered wood components, solid-core wood doors, OSB, MDF, and plywood products) and include:
 - a. Manufacturer’s product data verifying that products contain no urea-formaldehyde resins.
18. Entryway Systems: Submit manufacturer’s cut sheets for walk-off systems installed to capture particulates, including permanently installed grates, grilles, slotted systems, direct glue-down walk-off mats, and non-permanent roll-out

mats. Include shop drawings indicating length of walk-off system in direction of travel.

19. Air Filtration: Submit manufacturer's cut sheets and product information for filtration media per Section 23 81 00, Unitary HVAC Equipment.
20. Mercury in Lighting: Submit manufacturer's cut sheets or product data for fluorescent or HID lamps highlighting mercury content per Section 26 50 00, Lighting.
21. Lighting Controls: Submit manufacturer's cut sheets and shop drawing documentation highlighting lighting controls systems components.
22. Thermal Comfort Controls: Submit manufacturer's cut sheets and shop drawing documentation highlighting thermal comfort-control systems components.
23. Blended Cement: Submit the following documentation for concrete mixes:
 - a. Copies of concrete design mixes for installed concrete
 - b. Copies of typical regional baseline concrete design mixes for each compressive strength used on the Project
 - c. Quantities in cubic yards of each installed concrete mix
24. Gypsum Wall Board: Submit manufacturer's cut sheets or product data verifying that all gypsum wallboard products are moisture and mold-resistant.
25. Fiberglass Insulation: Submit manufacturer's cut sheets or product data verifying that fiberglass batt insulation contains no urea-formaldehyde.
26. Green Housekeeping: Submit documentation of cleaning products and janitorial paper products used during construction meet the VOC limits and content requirements per Section 01 74 14, Cleaning.

1.06 PROJECT MEETINGS

- A. General: Refer to Section 01 31 19, Project Meetings for general project meeting requirements.
- B. Preconstruction Meeting: Sustainability Requirements shall be an agenda item at the pre-construction meeting. The purpose of this agenda item is to develop an understanding of the Project's Sustainability Requirements and coordination of the Contractor's management of these requirements.
- C. Construction Job Conferences: The status of compliance with the Sustainability Requirements of these specifications will be an agenda item at all regular job meetings conducted during the course of work at the site.

1.07 DELIVERY, STORAGE AND HANDLING

- A. General: Package, transport, and store materials in accordance with Section 01 60 00, Product Requirements.
- B. Packaging: Deliver materials in recyclable or in reusable packaging such as cardboard, wood, paper, or reusable blankets, which will be reclaimed by supplier or manufacturer for recycling.
 - 1. General: Minimize packaging materials to maximum extent possible while still ensuring protection of materials during delivery, storage, and handling:
 - a. Unacceptable Packaging Materials: Polyurethane, polyisocyanate, polystyrene, polyethylene, and similar plastic materials such as “foam” plastics and “shrink-fit” plastics.
 - 2. Reusable Blankets: Deliver and store materials in reusable blankets and mats reclaimed by manufacturers or suppliers for reuse where program exists or where program can be developed for such reuse.
 - 3. Pallets: Where pallets are used, suppliers shall be responsible to ensure pallets are removed from site for reuse or for recycling.
 - 4. Corrugated Cardboard and Paper: Where paper products are used, recycle as part of construction waste management recycling program, or return to material's manufacturer for use by manufacturer or supplier.
 - 5. Sealants, Paint, Primers, Adhesives, and Coating Containers: Return to supplier or manufacturer for reuse where such program is available.

PART 2 – PRODUCTS

2.01 PRODUCT SUSTAINABILITY REQUIREMENTS

- A. Site Clearing: Topsoil and vegetated material shall be salvaged and reused on-site whenever possible. See Section 31 00 00, Earthwork and Section 31 11 00, Clearing and Grubbing.
- B. Site Paving: Refer to Division 32 paving sections for required Solar Reflectance Index for impervious paving.
- C. Roofing Materials: Refer to Division 8 roofing specifications for required Solar Reflectance Index for roofing systems.
- D. Exterior Lighting Fixtures: Refer to Section 26 50 00, Lighting for requirements to minimize exterior light pollution.
- E. Irrigation Systems: Refer to Section 32 84 00, Planting Irrigation for water conservation requirements.
- F. Water-Conserving Fixtures: Refer to Division 22 for maximum flow and flush rates for specific fixtures.

- G. Process Water Use: Employ strategies that in aggregate result in 20 percent less water use than the EPACT 2005 process water use baseline for the project. For equipment not addressed by EPACT 2005, equipment performance requirements may be proposed, provided documentation supporting the proposed benchmark or industry standard is submitted.
- H. Elimination of Ozone-Depleting Substances: Refer to Section 23 81 00, Unitary HVAC Equipment, Section 21 22 00, Clean Agent Fire Extinguishing System, and Section 07 21 11, Building Insulation.
- I. Appliances and Equipment: All Energy Star eligible equipment and appliances, including office equipment, computers and printers, and electronics (excluding HVAC and lighting components), shall be qualified by EPA's Energy Star or EPEAT programs.
- J. Outdoor Air Delivery Monitoring: Refer to Section 23 09 00, Instrumentation and Control for HVAC for HVAC monitoring requirements.

2.02 RECYCLED CONTENT OF MATERIALS

- A. Provide building materials with recycled content such that post-consumer recycled content value plus half the pre-consumer recycled content value constitutes a minimum of 20 percent of the cost of materials used for the Project, exclusive of all MEP equipment, labor, and delivery costs. The Contractor shall make all attempts to maximize the procurement of materials with recycled content.
- B. The post-consumer recycled content value of a material shall be determined by dividing the weight of post-consumer recycled content by the total weight of the material and multiplying by the cost of the material.
- C. The pre-consumer recycled content value of a material shall be determined by dividing the weight of pre-consumer recycled content by the total weight of the material and multiplying by the cost of the material.
- D. Do not include mechanical and electrical components in the calculations.
- E. Do not include labor and delivery costs in the calculations.
- F. Recycled content of materials shall be defined according to the Federal Trade Commission's "Guide for the Use of Environmental Marketing Claims," 16 CFR 260.7 (e).
- G. Utilize all on-site existing paving materials that are scheduled for demolition as granulated fill, and include the cost of this material had it been purchased in the calculations for recycled content value.

2.03 REGIONAL MATERIALS

- A. Target percentages for regional materials will vary by project. Where possible, contractor shall select materials harvested and manufactured regionally, within a

500-mile “adjusted radius” of the project site. The “adjusted radius” allows an adjustment factor for transportation with lower environmental impact. Rail miles are multiplied by a factor of 3; ship miles are multiplied by a factor of 15:

1. The regional content fraction of a material shall be determined by the proportion by weight of its constituents that are extracted, harvested, or sourced within 500 miles of the project site. The regional fraction of the material is then multiplied by the cost of the material to determine the regional content value. If a material is processed or manufactured more than 500 miles from the project site, then no part of the material can be counted for regional content value.
- B. The Contractor shall make all attempts to maximize the procurement of materials within this radius. In the event that materials comprising a significant percentage of the total project materials (5 percent or more) cannot be regionally sourced, contractor shall provide the Engineer with an explanation in writing.

2.04 RAPIDLY RENEWABLE MATERIALS

- A. Biobased Products:
1. Use only biobased concrete form-release products.
 2. Solid Wood Products: All new solid-wood-based materials will be certified as “FSC 100 percent” by an independent third party in accordance with FSC Forest Stewardship Council “Principles and Criteria” and will have received Chain-of-Custody Certification as certified by an accredited certification group such as Smartwood or Scientific Certification Systems (SCS).
 3. Other Wood Products: All other new wood-based materials will be certified by an independent third party in accordance with any of the following standards:
 - a. FSC: Forest Stewardship Council “Principles and Criteria” and has received Chain-of-Custody Certification as certified by an accredited certification group such as Smartwood or Scientific Certification Systems (SCS).
 4. Preservative-treated lumber with chromated copper arsenate (CCA) treatments is not permitted, and lumber with copper-based treatments (such as ACQ) is permitted only for ground-contact applications.
 5. Wood-based materials include but are not limited to the following materials (when made from wood), engineered wood products, or wood-based panel products:
 - a. Rough carpentry
 - b. Miscellaneous carpentry
 - c. Heavy timber construction
 - d. Wood decking
 - e. Particleboard
 - f. Plywood

- g. Metal-plate-connected wood trusses
- h. Structural glued-laminated timber
- i. Finish carpentry
- j. Architectural woodwork
- k. Wood paneling
- l. Wood veneer wall covering
- m. Wood flooring
- n. Wood lockers
- o. Wood cabinets
- p. Wood doors
- q. Non-rented temporary construction, including bracing, concrete formwork, pedestrian barriers, and temporary protection.
- r. Furniture (if included consistently in total project material cost).

B. Brominated Flame Retardants: brominated flame retardants in new furniture including cushioned office seating and lounge seating are not permitted.

2.05 LOW-EMITTING MATERIALS

A. Adhesives and Sealants:

1. All adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable, or SCAQMD Rule #1168 VOC limits, as shown in table below. VOC content shall be calculated according to 40 CFR 59, Subpart D (EPA method 24).
2. Aerosol adhesives, sealants, and caulking compounds (in units of product, less packaging, which do not weigh more than one pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards California Code of Regulations, Title 17, commencing with section 94507.

a.	Carpet Adhesives	50 g/L
b.	Carpet Pad Adhesives	50 g/L
c.	Wood Flooring Adhesives	100 g/L
d.	Rubber Floor Adhesives	60 g/L
e.	Subfloor Adhesives:	50 g/L
f.	Ceramic Tile Adhesives:	65 g/L

SUSTAINABILITY REQUIREMENTS

g.	VCT and Sheet Vinyl Adhesives:	50 g/L
h.	Gypsum Board and Panel Adhesives:	50 g/L
i.	Cove Base Adhesives:	50 g/L
j.	Multipurpose Construction Adhesives:	70 g/L
k.	Structural Glazing Adhesives and Compounds:	100 g/L
l.	Single-Ply Roofing Membrane Adhesives	250 g/L
m.	Other Adhesive not specifically listed	50 g/L
n.	PVC Welding Compounds	285 g/L
o.	CPVC Welding Compounds:	270 g/L
p.	ABS Welding Compounds:	325 g/L
q.	Adhesive Primer for Plastic:	250 g/L
r.	General Contact Adhesive:	80 g/L
s.	Special Purpose Contact Adhesive (used to bond melamine covered board, metal, unsupported vinyl, Teflon, ultra-high molecular weight polyethylene, rubber or wood veneer 1/16 inch or less in thickness to any surface):	250 g/L
t.	Structural Wood Member Adhesive	140 g/L
u.	Top and Trim Adhesive	250 g/L
	Substrate Specific Applications	
v.	Metal to Metal Adhesives	30 g/L
w.	Plastic Foam Adhesives:	50 g/L
x.	Adhesives for Porous Materials (Except Wood):	50 g/L
y.	Wood Glues	30 g/L
z.	Millwork and Casework Adhesives	20g/L
aa.	Fiberglass Adhesives	80 g/L

SUSTAINABILITY REQUIREMENTS

	Sealants	
bb.	Architectural Sealants	250 g/L
cc.	Nonmembrane Roof Sealants	300 g/L
dd.	Roadway	250 g/L
ee.	Single-Ply Roof Membrane Sealants	450 g/L
ff.	Other Sealants	420 g/L
	Sealant Primers	
gg.	Sealant Primers for Nonporous Substrates	250 g/L
hh.	Sealant Primers for Porous Substrates	775 g/L
ii.	Carpet Seam Sealer:	50g/L
jj.	Modified Bituminous Sealant Primers	500 g/L
kk.	Other Sealant Primers	750 g/L
	Aerosol Adhesive	
ll.	Aerosol Adhesive, General Purpose Mist Spray:	65% by weight
mm.	Aerosol Adhesive, General Purpose Web Spray:	55 % by weight.
nn.	Special Purpose Aerosol Adhesive (All Types):	70% by weight.

3. Interior sealants shall not contain: mercury, butyl rubber, neoprene, SBR (styrene butadiene rubber), or nitrile.
4. Sealants and glazing compounds shall not contain aromatic solvents (organic solvent with a benzene ring in its molecular structure), fibrous talc, asbestos, formaldehyde, halogenated solvents, mercury, lead, cadmium, or hexavalent chromium.
5. Adhesives shall not contain urea-formaldehyde.

B. Paints and coatings:

1. Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB Architectural Coatings Suggested Control Measure, as shown in the Table below. VOC limits for paints and coatings shall be calculated according to 40 CFR 59, Subpart D (EPA method 24).

SUSTAINABILITY REQUIREMENTS

2. Aerosol paints and coatings shall meet the Project-Weighted MIR Limits for ROC in section 94522(a)(3) and other requirements, including prohibitions on use of toxic compounds and ozone-depleting substances, in sections 94522(c)(2) and (d)(2) of the California Code of Regulations, Title 17, commencing with section 94507; and in areas under the jurisdiction of the Bay Area Air Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8 Rule 49.
3. Table of Allowable VOCs for Paints and Coatings.

a.	Flat Paints, Coatings, and Primers:	50 g/L
b.	Nonflat Paints, Coatings, and Primers	100 g/L
c.	Nonflat – High Gloss Coatings	150 g/L
d.	Aluminum Roof Coatings	400 g/L
e.	Basement Specialty Coatings	400 g/L
f.	Bituminous Roof Coatings	50 g/L
g.	Bituminous Roof Primers	350 g/L
h.	Bond Breakers	350 g/L
i.	Concrete Curing Compound	350 g/L
j.	Concrete Sealer	100 g/L
k.	Garage Deck/Driveway Sealer	50 g/L
l.	Dry-Fog Coatings:	400 g/L
m.	Faux Finishing Coatings	350 g/L
n.	Fire Resistive Coatings	350 g/L
o.	Floor Coatings	100 g/L
p.	Form Release Agents:	250 g/L
q.	Graphic Arts Coatings (sign paints)	500 g/L
r.	High Temperature Coatings	420 g/L
s.	Industrial Maintenance Coatings	250 g/L.
t.	Low Solids Coatings (includes water and exempt)	120 g/L
u.	Magnesite Cement Coatings	450 g/L
v.	Mastic Texture Coatings	100 g/L
w.	Metallic Pigmented Coatings	500 g/L

SUSTAINABILITY REQUIREMENTS

x.	Multi-color Coatings	250 g/L
y.	Pretreatment Wash Primers:	420 g/L
z.	Primers, Sealers, and Undercoaters	100 g/L
aa.	Reactive Penetrating Sealers	350 g/L
bb.	Recycled Coatings	250 g/L
cc.	Roof Coatings	50 g/L
dd.	Rust Preventative Coatings	250 g/L
ee.	Stains	250 g/L.
ff.	Stone Consolidants	450 g/L
gg.	Traffic Marking Coatings	100 g/L
hh.	Tub and Tile Refinish Coatings	420 g/L
ii.	Waterproofing Membranes	250 g/L
jj.	Wood Coatings	275 g/L
kk.	Wood Preservatives	350 g/L
ll.	Zinc-Rich Industrial Maintenance Primers:	340 g/L

4. Interior paints shall not contain antimicrobial additives (such as fungicides and biocides).
5. Interior field-applied varnishes and lacquers are not permitted.
6. Clear wood finishes, floor coatings, stains, sealers, and shellacs for interior elements shall comply with South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, rules in effect on January 1, 2004:
 - a. (Exterior) Clear Wood Finishes, Varnishes: 350 g/L
 - b. (Exterior) Clear Wood Finishes, Lacquers: 550 g/L
 - c. Floor Coatings: 100 g/L
 - d. (Exterior) Shellacs, Clear: 730 g/L
 - e. (Exterior), Pigmented: 550 g/L
 - f. Stains: 250 g/L
 - g. Waterproofing Sealers: 250 g/L

SUSTAINABILITY REQUIREMENTS

- h. Sanding Sealers: 275 g/L
 - i. All Other Sealers: 200 g/L
7. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
8. Restricted Components: Paints and coatings shall not contain any of the following per Green Seal Standard GS-11:
- a. Acrolein
 - b. Acrylonitrile
 - c. Antimony
 - d. Benzene
 - e. Butyl benzyl phthalate
 - f. Cadmium
 - g. Di (2-ethylhexyl) phthalate
 - h. Di-n-butyl phthalate
 - i. Di-n-octyl phthalate
 - j. 1,2-dichlorobenzene
 - k. Diethyl phthalate
 - l. Dimethyl phthalate
 - m. Ethylbenzene
 - n. Formaldehyde
 - o. Hexavalent chromium
 - p. Isophorone
 - q. Lead
 - r. Mercury
 - s. Methyl ethyl ketone
 - t. Methyl isobutyl ketone
 - u. Methylene chloride
 - v. Naphthalene
 - w. Toluene (methylbenzene)

- x. 1,1,1-trichloroethane
 - y. Vinyl chloride
 - z. Xylene
- C. Flooring systems: Floorcovering systems, including carpet, resilient flooring, and engineered wood and bamboo flooring shall meet or exceed the indoor emissions criteria as specified in the applicable technical specifications sections.
- D. Composite Wood and Agrifiber Binders: composite wood, agrifiber products, and wood doors shall contain no urea-formaldehyde resins.
- E. Fiberglass Insulation: Fiberglass batt insulation shall contain no formaldehyde-based binders or shall be third-party certified for conformance with Greenguard Gold Certification or Indoor Advantage Gold.
- F. Duct Acoustical Insulation: Mechanical sound insulation materials within the duct shall consist of an impervious, non-porous coating that prevents dust from accumulating in the insulating materials.
- G. Green Housekeeping: Refer to Section 01 74 14, Cleaning for green cleaning requirements.

PART 3 – EXECUTION

3.01 FIELD EXECUTION OF SUSTAINABILITY REQUIREMENTS

- A. The contractor is responsible for ensuring proper field execution of all Sustainability Requirements, submittal requirements; communication with sub-contractors of all requirements; and submission of all documentation in a timely manner.
- B. Contractor shall notify the Engineer immediately of failure to meet any stated Sustainability Requirement.

3.02 CONSTRUCTION WASTE MANAGEMENT

- A. Implement the Construction Waste Management Plan (CWMP), as defined in Section 01 74 21, Waste Management.

END OF SECTION 01 81 13