

SPECIAL SPECIFICATION

SECTION 01805S

ENVIRONMENTAL OBJECTIVES

PART 1 - GENERAL

1.01 RELATED SECTIONS

- A. Refer to Division 1 Section "Systems Commissioning" for a description of the commissioning process.

1.02 ENVIRONMENTAL GOALS AND IMPLEMENTATION STRATEGIES

- A. Owner has established the following environmental goals and implementation strategies for the Project. These goals and strategies are based upon the LEED Green Building Rating System™ as developed by the U.S. Green Building Council, **1015 18th Street, NW, Suite 805, Washington, DC 20036. Phone: 202/82-USGBC Fax: 202/828-5110.**
- B. While these goals and implementation strategies are incorporated within the Contract Documents, suggestions and input from the Contractor for implementing these goals are encouraged. A team approach is encouraged.
- C. Sustainable Sites:
 - 1. Control erosion to reduce negative impacts on water and air quality.
 - a. Prevent loss of soil during construction by storm water runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
 - b. Prevent sedimentation of storm sewer or receiving streams and/or air pollution with dust and particulate matter.
 - 2. Reduce pollution and land development impacts from automobile use.
 - a. Provide suitable means for securing bicycles, with convenient changing/shower facilities for use by cyclists, 5% or more of building occupants.
 - 3. Conserve existing natural areas and restore damaged areas to provide habitat and promote bio-diversity.
 - a. Restore a minimum of 50% of the remaining open area by planting native or adapted vegetation.
 - b. Reduce the development footprint (including building, access roads and parking) to exceed the local zoning's open space requirement for the site by 25%.

4. Limit disruption of natural water flows by eliminating storm water runoff, increasing on-site infiltration and reducing contaminants.
 - a. Treatment systems designed to remove 80% of the average annual post development total suspended solids (TSS), and 40% of the average annual post development total phosphorous (TP), by implementing Best Management Practices (BMPs) outlined in EPA's "Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters."
5. Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.
 - a. Use light-colored/high-albedo materials (reflectance of at least 0.3) for 30 % of the site's non-roof impervious surfaces.
 - b. Use ENERGY STAR Roof-compliant, high reflectance roofing (initial reflectance of at least 0.65 and three-year aged reflectance of at least 0.5) for a minimum of 75% of the roof surface.
6. Eliminate light trespass from the building site, improve night sky access, and reduce development impacts on nocturnal environments.
 - a. Meet Illuminating Engineering Society of North America (IESNA) foot-candle level requirements as stated in the "Recommended Practice Manual," AND design interior and exterior lighting such that zero direct-beam illumination leaves the building site.

D. Water Efficiency:

1. Limit or eliminate the use of potable water for landscape irrigation.
 - a. Use high efficiency irrigation technology, OR, use captured rain or recycled site water, to reduce potable water consumption for irrigation by 50% over conventional means.
2. Maximize water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.
 - a. Employ strategies that in aggregate use 30% less water than the water use baseline calculated for the building (not including irrigation) after meeting Energy Policy Act of 1992 fixture performance requirements.

E. Energy and Atmosphere:

1. Verify and ensure that fundamental building elements and systems are designed, installed and calibrated to operate as intended.
 - a. Engage a commissioning authority.
 - b. Document design intent and the basis of design for the building and systems.

- c. Include Systems Commissioning in the construction documents.
 - d. Develop and utilize a commissioning plan.
 - e. Verify installation, functional performance, training and documentation.
 - f. Complete a commissioning report.
 - g. Refer to Division 1 Section "Systems Commissioning."
2. Establish the minimum level of energy efficiency for the base building and systems.
 - a. Design to meet building energy efficiency and performance as required by ASHRAE 90.1-1999 or the local energy code, which ever is the more stringent. Analyze expected baseline building performance using the System/Component Method.
 3. Reduce ozone depletion
 - a. Zero use of CFC-based refrigerants in new building HVAC&R systems.
 4. Achieve increasing levels of energy performance above the perquisite standard to reduce environmental impacts associated with excessive energy use.
 - a. Exceed the requirements of ASHRAE Standard 90.1-1999, demonstrated by a whole building simulation, by 20%.
 5. Verify and ensure that the entire building is designed, constructed and calibrated to operate as intended with third party quality control assurance.
 - a. Implement comprehensive best practice commissioning procedures which at a minimum includes qualified, third part review of the following documents:
 - (1) Basis of design.
 - (2) Construction documents.
 - (3) Selective review of system critical contractor submittals.
 - b. Refer to Division 1 Section "Systems Commissioning."
 6. Reduce ozone depletion and support early compliance with the Montreal Protocol.
 - a. Install building level HVAC and refrigeration equipment and fire suppression systems that do not contain HCFC's or Halon.
 7. Provide for the ongoing accountability and optimization of building energy and water consumption performance over time.
 - a. Comply with the installed equipment requirements for continuous metering as stated in Option B: Methods by Technology of the US DOE's

International Performance Measurement and Verification Protocol (IPMVP)
for the following:

- (1) Lighting systems and controls.
- (2) Constant and variable motor loads.
- (3) Variable frequency drive (VFD) operation.
- (4) Chiller efficiency at variable loads (kW/ton).
- (5) Cooling load.
- (6) Air and water economizer and heat recovery cycles.
- (7) Air distribution static pressures and ventilation air volumes.
- (8) Boiler efficiencies.
- (9) Building specific process energy efficiency systems and equipment.
- (10) Indoor water risers and outdoor irrigation systems.

b. Refer to Division 1 Section "Systems Commissioning."

F. Materials and Resources:

1. Facilitate the reduction of waste generated by building occupants that is hauled to and disposed of in landfills.
 - a. Provide an easily accessible area that serves the entire building that is dedicated to the separation, collection, and storage of materials for recycling including (at a minimum) paper, glass, plastics, and metals.
2. Divert construction, demolition and land clearing debris from landfill disposal. Redirect recyclable material back to the manufacturing process.
 - a. Develop and implement a waste management plan, quantifying material diversion by weight.
 - (1) Recycle and/or salvage at least 75% (by weight) of construction, demolition and land clearing debris.
 - b. Refer to Division 1 Section "Construction Waste Management."
3. Increase demand for building products that have incorporated recycled content material, reducing the impacts resulting from extraction of new material.
 - a. Specify a minimum of 50% of building materials that contain in aggregate, a minimum of 20% post-consumer recycled content material, OR, a minimum 40% post-industrial recycled content material.

4. Increase demand for building products that are manufactured locally, reducing the environmental impacts resulting from transportation and supporting the local economy.
 - a. Specify a minimum of 20% of building materials that are manufactured regionally within a radius of 500 miles
 - b. Of these regionally manufactured materials, specify and minimum of 50% that are extracted, harvested or recovered within 500 miles.
5. Reduce the use and depletion of finite raw and long cycle renewable materials by replacing them with rapidly renewable materials.
 - a. Choose materials that substantially replenish themselves faster than traditional extraction demand (e.g. planted and harvested in less than a 10 year cycle) and do not result in significant biodiversity loss, increase erosion, air quality impacts, and that are sustainably managed.
6. Encourage environmentally responsible forest management.
 - a. Use a minimum of 50% of wood-based materials certified in accordance with the Forest Stewardship Council guidelines for wood building components including framing, flooring, finishes, furnishings and site furnishings.

G. Indoor Environmental Quality (IEQ):

1. Establish a minimum IAQ performance to prevent the development of indoor air quality problems in buildings, maintaining the health and well being of the occupants.
 - a. Meet the minimum requirements of voluntary consensus standard ASHRAE 62-1989, ventilation for Acceptable Indoor Air Quality and approved Addenda.
2. Prevent exposure of building occupants and systems to Environmental Tobacco Smoke (ETS).
 - a. Zero exposure of nonsmokers to ETS by prohibition of smoking in the building, OR by providing a facility engineered using ASTM approved test methods and designs that effectively contain, capture and remove ETS from the building, as demonstrated by required smoking facility testing in the contract documents and incorporation of critical smoking facility systems testing in the commissioning plan and report.
3. Provide capacity for indoor air quality (IAQ) monitoring to sustain long term occupant health and comfort.
 - a. Install a permanent carbon dioxide (CO₂) monitoring system that provides feedback on space ventilation performance in a form that affords operational adjustments, AND specify initial operational set point parameters that maintain indoor carbon dioxide levels no higher than outdoor levels by more than 530 parts per million at any time.

4. Provide for the effective delivery and mixing of fresh air to building occupants to support their health, safety and comfort.
 - a. Design ventilation systems that result in an air distribution and flow pattern that involves not less than 90% of the room or zone area in the direction of airflow.
5. Prevent indoor air quality problems resulting from the construction process, to sustain long-term tradesman and occupant health and comfort.
 - a. Protect the ventilation system components from contamination, OR, provide cleaning of the ventilation system components exposed to contamination during construction prior to occupancy.
 - b. Provide a continuous ventilation rate of one air change per hour minimum during construction, OR, conduct a two-week building flush out with new filtration media at 100% outside air after construction ends and prior to occupancy. Provide a minimum of 85% filtration (as determined by ASHRAE Standard 52.1-1992) on any return air systems operational during construction and replace filtration media prior to occupancy.
6. Reduce the quantity of indoor air contaminants that are odorous or potentially irritating to provide installer and occupant health and comfort.
 - a. Meet VOC limits for adhesives, sealants, paints, composite wood products and carpet systems as follows:
 - (1) Adhesives meet or exceed the VOC limits of South Coast Air Quality Management District Rule #1168 by, AND, all sealants used as a filler must meet or exceed Bay Area Air Resources Board Reg. 8, Rule 51.
 - (2) Paints and coatings must meet or exceed the VOC and chemical component limits of Green Seal requirements.
 - (3) Carpet systems must meet the Carpet and Rug Institute Green Label Indoor Air Quality Test Program.
 - (4) Composite wood products must contain no added urea-formaldehyde or phenol-formaldehyde resins.
 - b. Meet VOC limits as follows:

Material or Product	Low VOC Content Level
Form Release Agents	350 g/L VOC content
Plastic Laminate Adhesive	20 g/L VOC content
Casework and Millwork Adhesives	20 g/L VOC content
Water based Joint Sealants	50 g/L VOC content
Non-water based Joint Sealants	350 g/L VOC content
Gypsum Drywall Joint Compound	20 g/L VOC content
Acoustic Panel Ceiling Finish	50 g/L VOC content
Resilient Tile Flooring Adhesive	100 g/L VOC content
Vinyl Flooring Adhesives	100 g/L VOC content
Carpet Adhesive	50 g/L VOC content
Carpet Seam Sealer	50 g/L VOC content
Water-based Paint & Polychromatic finish coatings	150 g/L VOC content
Solvent -based Paint	380 g/L VOC content
High Performance Water-Based Acrylic coatings	250 g/L VOC content
Pigmented Acrylic Sealers	250 g/L VOC content
Catalyzed Epoxy coatings	250 g/L VOC content
High Performance Silicone	250 g/L VOC content
Casework Sealant	50 g/L VOC content

7. Avoid exposure of building occupants to potentially hazardous chemicals that adversely impact air quality.

- a. Employ permanent entryway systems (grills, grates, etc.) to capture dirt, particulates, etc. from entering the building at all high volume entryways, AND provide areas with floor to ceiling partitions with separate outside venting and negative pressure where chemical use occurs (including housekeeping areas and copy/print rooms), AND provide drains plumbed for appropriate disposal of liquid waste in spaces where water and chemical concentrate mixing occurs.
8. Provide a high level of individual occupant control of thermal, ventilation, and lighting systems to support optimum health, productivity, and comfort conditions.
 - a. Provide controls for each individual for airflow, temperature, and lighting for 50% of the non-perimeter, regularly occupied areas.
9. Provide for a thermally comfortable environment that supports the productive and healthy performance of the building occupants.
 - a. Comply with ASHRAE Standard 55-192, Addenda 1995 for thermal comfort standards including humidity control within established ranges per climate zone.
 - b. 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.
10. Provide a connection between indoor spaces with the outdoor environment through the introduction of sunlight and views into the occupied areas of the building.
 - a. Diffuse sunlight to reach 90% of all regularly occupied spaces not including copy rooms, storage areas, mechanical and other low occupancy support areas with glare control provided.
 - b. Direct line of sight to vision glazing while seated from 90% of all regularly occupied spaces, not including copy rooms, storage areas, mechanical and other low occupancy support areas.

H. Innovation Credits and Design/Build Process:

1. To provide design teams and projects the opportunity to be awarded points for exceptional performance above requirements set by the LEED Green Buildings System and/or innovative performance in Green Building categories not specifically addressed by the LEED Green Building Rating System.
 - a. In writing using the LEED Credit Equivalence process, identify the INTENT of the proposed innovation credit, the proposed REQUIREMENT for compliance, the proposed DOCUMENTATION to demonstrate compliance and the TECHNOLOGIES/STRATEGIES used to meet the required elements.

2. To support and encourage the design integration required by a LEED Green Building project and to streamline the application and certification process.
 - a. At least one principal participant of the project team that has successfully completed the LEED Accredited Professional Exam.
3. Maximize water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.
 - a. Save:
 - (1) DI water to MicroFab 97 GPM = 5820 Gal/hour
 - (2) AW max out of MicroFab 90 GPM = 5400 Gal/hour
 - (3) City water max to MicroFab 30 GPM = 1800 Gal/hour

1.03 SUBMITTALS

- A. Submit item(s) required in individual specification sections according to the Conditions of the Contract and Division 1 Specifications Sections.

1.04 DOCUMENTATION

- A. Documentation submitted as required by individual specification sections to assure compliance with Environmental Objectives as stated in the Section shall be secured and delivered to the Owner according to the Conditions of Contract and Division 1 Specification Sections. This documentation shall be instrumental in the auditing of this Project for compliance to this Section.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not used

END OF SECTION